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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026**

PHYSICS

Energy Resources and Conservation (G04-GE-OE-101)

Day & Date: Thursday, 23-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labeled diagrams wherever necessary.
4) Use of Log table and Calculator is allowed.

Q.1 Multiple choice questions.

06

- 1) _____ energy is the form of energy input in the energy chain of an electric fan.

a) Mechanical	b) Electrical
c) Thermal	d) Sound

- 2) _____ converts sunlight directly into electricity.

a) Thermocouple	b) Solar collector
c) Photovoltaic cell	d) Solar cooker

- 3) Wind farms are usually located at/on _____.
 - a) coastal and open plain areas
 - b) underground
 - c) buildings
 - d) houses

- 4) _____ gas is commonly produced during anaerobic digestion of biomass.

a) Methane	b) Carbon monoxide
c) Hydrogen	d) Oxygen

- 5) _____ type of energy conversion takes place in a microphone.

a) Light to electrical	b) Sound to mechanical
c) Light to thermal	d) Sound to electrical

- 6) _____ device is used to measure wind speed.

a) Odometer	b) Anemometer
c) Thermometer	d) Barometer

Q.2 Answer the following questions. (Any Three)

06

- a) State any two advantages of nuclear energy.
- b) State any two limitations of solar energy.
- c) Differentiate between horizontal-axis and vertical-axis wind turbines.
- d) State any two disadvantages of biomass energy.
- e) Mention any four devices that convert electrical energy into mechanical energy.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain any three benefits of converting solar energy into electrical energy.
 - b) Define primary and secondary energy resources with one example of each.
 - c) Explain how wind energy can help reduce electricity bills.
- Q.4 Answer the following questions. (Any Two) 06**
- a) What is biogas? Name three types of raw materials used to produce it.
 - b) Give three practical examples of how energy is wasted and how it can be prevented.
 - c) What are the advantages of using fossil fuels for energy production?
- Q.5 Answer the following question. (Any One) 06**
- a) Explain the working principle of a solar cell with V-I characteristics. How does it convert sunlight into electrical energy?
 - b) Discuss the advantages and disadvantages of renewable and non-renewable energy sources with examples for each.

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Set P

B.Sc. (Plain) (सत्र – I) (नवीन) (NEP CBCS) परीक्षा: मार्च/एप्रिल – २०२६
CHEMISTRY

Environmental Chemistry (G04-GE-OE-102)

वार, दिनांक: गुरुवार, २३-०४-२०२६
वेळ: सकाळी ०९:०० ते १०:३०

कमाल गुण: ३०

सूचना : १) सर्व प्रश्न अनिवार्य आहेत.

२) उजवीकडील अंक पूर्ण गुण दर्शवितात.

३) आवश्यक तेथे शास्त्रीय व तांत्रिकदृष्ट्या योग्य नामनिर्देशित आकृती काढा आणि रासायनिक समीकरणे द्या.

प्र.१ खालील दिलेले योग्य पर्याय निवडून गाळलेल्या जागा भरा.

०६

१) जागतिक तापमानवाढीसाठी ——— चा ऑक्साईड प्रामुख्याने जबाबदार आहे.

अ) ऑक्सिजन

ब) कार्बन

क) नायट्रोजन

ड) सोडियम

२) जलसंस्करणाच्या 'आयन विनिमय पद्धती' मध्ये, ——— विनिमय रेझिन वापरला जातो.

अ) धनायन

ब) ऋणायन

क) धनायन व ऋणायन दोन्हीही

ड) झी ओलाईट्स

३) पाण्यात असलेल्या सेंद्रिय पदार्थांचे ऑक्सिडेशन होण्यासाठी लागणाऱ्या एकूण ऑक्सिजनला ——— म्हणतात.

अ) रासायनिक ऑक्सिजन मागणी

ब) जैविक ऑक्सिजन मागणी

क) कमाल मर्यादित मूल्य

ड) विरघळलेला ऑक्सिजन

४) ——— ही पाण्यातील जंतू आणि जीवाणू काढून टाकण्यासाठी वापरली जाणारी भौतिक पद्धत आहे.

अ) गाळण

ब) ओझीनीकरण

क) क्लोरीनीकरण

ड) उर्ध्वपातन

५) ज्या पाण्याला साबणाने चांगला फेस येत नाही, त्याला ——— पाणी म्हणतात.

अ) सुफेन

ब) उर्ध्वपातीत

क) दुष्फेन

ड) शुद्ध

- ६) मृदा प्रदूषण हे ——— पदार्थांमुळे होते.
 अ) औद्योगिक
 ब) घरगुती
 क) किरणोत्सर्गी
 ड) वरीलपैकी सर्व

- प्र.२ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही तीन) 0६
 अ) व्याख्या द्या.
 १) प्रदूषण
 २) पेय जल
 ब) उदाहरणासह वायू प्रदूषकांचे फक्त वर्गीकरण सांगा.
 क) जल प्रदूषणाचे कोणतेही दोन स्रोत थोडक्यात स्पष्ट करा.
 ड) 'जैविक ऑक्सिजनची मागणी (BOD)' ही संज्ञा थोडक्यात स्पष्ट करा.
 इ) जलशुद्धीकरण प्रक्रियेच्या 'अवसादन' या पद्धतीबद्दल थोडक्यात सांगा.
- प्र.३ संक्षिप्त टिपा लिहा. (कोणत्याही दोन) 0६
 अ) मृदा प्रदूषणाचे स्रोत आणि त्यावरील नियंत्रण
 ब) जल प्रदूषणाचे प्रकार
 क) गंधकाच्या (सल्फर) ऑक्साईडचे स्रोत आणि त्यांचे आरोग्याविषयक धोके
- प्र.४ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही दोन) 0६
 अ) जलसंस्करणाची 'सक्रियित अवपंक / गाळ प्रक्रिया' विशद करा.
 ब) नायट्रोजनच्या ऑक्साईडचे स्रोत आणि त्यांचे आरोग्यविषयक धोके स्पष्ट करा.
 क) जलशुद्धीकरण प्रक्रियेत वापरल्या जाणाऱ्या रासायनिक पद्धतींची माहिती द्या.
- प्र.५ खालील प्रश्नाचे उत्तर लिहा. (कोणताही एक) 0६
 अ) ध्वनी प्रदूषणाची कारणे, परिणाम आणि नियंत्रण उपायांवर चर्चा करा.
 ब) जल प्रदूषकांच्या प्रकारांचे सविस्तर वर्णन करा.

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
CHEMISTRY
Environmental Chemistry (G04-GE-OE-102)**

Day & Date: Thursday, 23-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams and give equations wherever necessary.

Q.1 Choose the correct alternative from the options. 06

- 1) The oxide of _____ is mainly responsible for global warming.
 - a) oxygen
 - b) carbon
 - c) nitrogen
 - d) sodium

- 2) In 'ion exchange method' for purification of water, _____ exchange resin is used.
 - a) cation
 - b) anion
 - c) both cation and anion
 - d) zeolites

- 3) The total amount of oxygen required for oxidation of organic substances present in water is called _____.
 - a) Chemical Oxygen Demand
 - b) Biological Oxygen Demand
 - c) Threshold Limit Value
 - d) Dissolved Oxygen

- 4) _____ is the physical method used to remove germs and bacteria from water.
 - a) Filtration
 - b) Ozonization
 - c) Chlorination
 - d) Distillation

- 5) The water which does not give good lather with soap is called _____.
 - a) soft
 - b) distilled
 - c) hard
 - d) pure

- 6) Soil pollution is due to _____ waste.
 - a) industrial
 - b) domestic
 - c) radioactive
 - d) All of these

- Q.2 Answer the following questions. (Any Three) 06**
- a) Define:
 - 1) Pollution
 - 2) Potable water
 - b) Give only the classification of air pollutants with example.
 - c) Explain in brief any two sources of water pollution.
 - d) State and explain the term 'Biological Oxygen Demand (BOD)'.
 - e) Explain in brief sedimentation method for treatment of water.
- Q.3 Write Short Notes. (Any Two) 06**
- a) Effects and control measures of soil pollution
 - b) Types of water pollution
 - c) Sources and health hazards of oxides of sulphur.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Describe 'Activated sludge process' for treatment of water.
 - b) Explain the sources and health hazards of oxides of nitrogen.
 - c) Discuss the Chemical methods employed in treatment of water.
- Q.5 Answer the following question. (Any One) 06**
- a) Discuss the sources, effects and control measures of sound pollution.
 - b) Describe the types of water pollutants in detail.

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
BOTANY
Horticulture (G04-GE-OE-103)**

Day & Date: Thursday, 23-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative. (MCQ) 06

- 1) Onion is the example of _____.

a) Bulb	b) Sucker
c) Offset	d) Runner

- 2) In grafting, the part of the plant that provides the root system is called _____.

a) Node	b) Scion
c) Stock	d) bud

- 3) Branch of horticulture deals with cultivation, processing and marketing of fruit is called _____.

a) Olericulture	b) agriculture
c) landscape	d) pomoculture

- 4) The garden implement _____ is useful to cut twigs of plant.

a) Khurupi	b) Garden shear
c) Secateur	d) budding knife

- 5) In seed propagation, _____ part of the plant develops into a seed after fertilization.

a) Ovary	b) Ovule
c) Petal	d) Anther

- 6) Modified stem of potato is called _____.

a) bulb	b) runner
c) rhizome	d) tuber

Q.2 Answer the following questions. (Any Three) 06

- a) What is Horticulture?
- b) Write the uses of water can.
- c) Give the name of one annual and one perennial plant.
- d) Write any two importance of propagation.
- e) Define olericulture.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Write the importance of horticulture.
 - b) Write a note on Garden shear.
 - c) write the advantages of sexual method of propagation.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Write a note on floriculture.
 - b) Write a note on T- budding.
 - c) Explain in brief rhizome with neat labelled diagram.
- Q.5 Answer the following question. (Any One) 06**
- a) With neat labelled diagram, explain the processes of potting.
 - b) What is air layering? Explain the process of air layering.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
ZOOLOGY
Aquarium Fish Keeping and Maintenance (G04-GE-OE-104)**

Day & Date: Thursday, 23-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative. (MCQ)**06**

- 1) What is the scientific name of gold fish?
 - a) *Carassius carpio*
 - b) *Carassius auratus*
 - c) *Cyprinus carpio*
 - d) *Cyprinus auratus*
- 2) Live food consist of _____.
 - a) Live worms
 - b) Small fishes
 - c) Water flies
 - d) All the above
- 3) What is the role of filter in aquarium?
 - a) Gives a beautiful look
 - b) Provide oxygen from environment
 - c) Hold the root of plants firmly
 - d) Make ammonia into less toxic
- 4) Which of the following protozoan disease is known as White spot disease?
 - a) Chilodonellosis
 - b) Ichthyophthiriasis
 - c) Hexamitiasis
 - d) Trichodiniasis
- 5) What is the optimum temperature of tank water?
 - a) 22°C
 - b) 26°C
 - c) 24°C
 - d) 28°C
- 6) The glass-plates of a home aquarium is sealed by _____.
 - a) Agar Glue
 - b) Polysulfide sealant
 - c) Silicon Rubber Sealant
 - d) Flour Glue

Q.2 Answer the following questions. (Any Three)**06**

- a) Define Aquarium.
- b) Give a list of endemic species of aquarium fishes.
- c) Significance of dry fish food.
- d) What is live bearer.
- e) Morphology of butterfly fish.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain the scope of aquarium fish industry.
 - b) Describe the common characteristics of freshwater aquarium fishes.
 - c) Explain the procedure for transportation of live fishes.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Enlist the material and equipment required for construction of home aquarium.
 - b) Give an account of different types of fish food.
 - c) Give an account of general maintenance of aquarium.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain water quality parameters required for aquarium fish keeping.
 - b) Describe nutritional requirement of aquarium fishes.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
MATHEMATICS
Quantitative Aptitudes for Competitive Examinations
(G04-GE-OE-110)**

Day & Date: Thursday, 23-04-2026

Max. Marks: 30

Time: 09:00 AM To 10:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative for each of the following. **06**

1) What is the sum of first 20 odd natural numbers?

- | | |
|--------|--------|
| a) 100 | b) 200 |
| c) 300 | d) 400 |

2) $\frac{3.5 \times 1.4}{0.7}$ _____.

- | | |
|--------|--------|
| a) 7.0 | b) 2.5 |
| c) 3.5 | d) 7.5 |

3) LCM of 15, 24, 35 and 54 is _____.

- | | |
|---------|---------|
| a) 5670 | b) 7560 |
| c) 7650 | d) 6570 |

4) $1200 + 568 \div 8 - 35 =$ _____.

- | | |
|---------|---------|
| a) 1458 | b) 1294 |
| c) 1236 | d) 1352 |

5) $\sqrt{110\frac{1}{4}} =$ _____.

- | | |
|----------|----------|
| a) 10.25 | b) 10.50 |
| c) 11.50 | d) 19.50 |

6) $15^2 + 11^2 - 18^2 + 6^3 =$ _____.

- | | |
|--------|--------|
| a) 240 | b) 258 |
| c) 242 | d) 238 |

Q.2 Answer the following questions. (Any Three) **06**

- a) Explain odd and even numbers.
- b) Find LCM of 72, 108 and 2100.
- c) Find x if $4368 + 2158 - 596 - x = 3421 + 1262$.
- d) Evaluate $\sqrt{6084}$ by using Factorization Method.
- e) Find the average of first 40 natural numbers.

Q.3 Answer the following questions. (Any Two)

06

- a) Arrange the fraction $\frac{3}{5}$, $\frac{4}{7}$, $\frac{8}{9}$, $\frac{9}{11}$ in their descending order.
- b) The sum of a rational number and its reciprocal is $\frac{13}{6}$ then find the numbers.
- c) Simplify
- $(27)^{1/3}$
 - $(256)^{1/4}$
 - $\left(\frac{1}{125}\right)^{1/3}$

Q.4 Answer the following questions. (Any Two)

06

- a) Express each of the following as a decimal.
- 6%
 - 28%
 - $\frac{1}{2}\%$
- b) If 30% of $A = 0.25$ of $B = \frac{1}{5}$ of C then find $A : B : C$
- c) Find simple interest on 68000 at $16\frac{2}{3}\%$ per annum for '9' months.

Q.5 Answer the following question. (Any One)

06

- a)
- Write the formula for when interest is compounded Annually, Half yearly and quarterly.
 - Find the compound interest on 16000 at 20% per annum for '9' months, compounded quarterly.
- b) Find the cost of
- Rs.7200, 8% stock at 90
 - Rs.4500, 8.5% stock at 4 premium
 - Rs.6400, 10% stock at 15 discount

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
STATISTICS
Fundamentals of Statistics (G04-GE-OE-111)**

Day & Date: Thursday, 23-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative. (MCQ) 06

- 1) Colors of flowers is an example of _____.
 - a) Quantitative variable
 - b) Qualitative variable
 - c) Skewed variable
 - d) Symmetric variable
- 2) With the help of ogive curves, one cannot determine _____.
 - a) Median
 - b) Deciles
 - c) Percentiles
 - d) Mode
- 3) If 10 is subtracted from each observation then mean of the set of n observations is _____.
 - a) Not affected
 - b) Zero
 - c) Increased by 10
 - d) Decreased by 10
- 4) In standard deviation, the deviation of the items x_i are always taken from _____.
 - a) Mean
 - b) Median
 - c) Mode
 - d) zero
- 5) Which of the following is not an example of quantitative characteristics?
 - a) Height
 - b) Weight
 - c) Wages
 - d) Blood group
- 6) The limits of Karl Pearson's coefficient of correlation (r) is _____.
 - a) 0 to 1
 - b) 0 to ∞
 - c) -1 to 1
 - d) None of the above

Q.2 Answer the following questions. (Any Three) 06

- a) Define discrete variable and give one example of discrete variable.
- b) Explain quantitative data and give one example of quantitative data.
- c) State merits and demerits of arithmetic mean.
- d) Define Mean Deviation and Mean Square Deviation.
- e) Define of Karl Pearson's coefficient of correlation (r) and state the limits of r.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain the construction of histogram.
 - b) Define Coefficient of Variation and explain its interpretation.
 - c) Define the terms: Class limits, class frequency, and cumulative frequency.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain the construction of Ogive curves.
 - b) State properties of correlation coefficient.
 - c) Explain lines of regression.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain types of correlations.
 - b) Find the mean and variance of first 10 natural numbers.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
COMPUTER SCIENCE
Office management Tools (G04-GE-OE-108)**

Day & Date: Thursday, 23-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative.**06**

- 1) Microsoft PowerPoint is a _____ program.
 - a) Graphics
 - b) Presentation
 - c) Data Analysis
 - d) All of the above
- 2) Which power point view works best for adding slide transition?
 - a) Slide sorter view
 - b) Slide show view
 - c) Slide view
 - d) Notes
- 3) Which option in Microsoft Word allows you to create personalized documents by merging with a data source?
 - a) Tables
 - b) Charts and Graphs
 - c) Mail Merge
 - d) Spelling and Grammar
- 4) Which option allows you to add a watermark to a document?
 - a) Insert → Header
 - b) Design → Watermark
 - c) Review → Watermark
 - d) Page Layout → Watermark
- 5) Which of the following software is used for making a resume?
 - a) MS Excel
 - b) MS Word
 - c) Dev C
 - d) Java
- 6) What is the default color of the pen in a PowerPoint slide?
 - a) Red
 - b) Blue
 - c) Green
 - d) Yellow

Q.2 Answer the following questions. (Any Three)**06**

- a) What is the use of word wrap.
- b) What is a cell in Excel?
- c) What is 'Format Painter' used for?
- d) Explain the importance of the MAX and MIN functions in Excel.
- e) What is the CONCATENATE function used for?

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain the PivotTable function.
 - b) What is the difference between a function and a formula in Excel?
 - c) How to insert a hyperlink to a PowerPoint presentation?
- Q.4 Answer the following questions. (Any Two) 06**
- a) How to create the Mail Merge in Microsoft Word?
 - b) What are the advantages of using PowerPoint?
 - c) How do you enter data into Excel?
- Q.5 Answer the following question. (Any One) 06**
- a) What are the main components of MS Word?
 - b) What is MS-Excel? Explain Data menu.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
ELECTRONICS
Basic Electronic Consumer Applications (G04-GE-OE-105)**

Day & Date: Thursday, 23-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternatives:

06

- 1) Solar panel is used for _____.
 - a) Decoration lighting
 - b) Charging battery
 - c) On/Off control of LED
 - d) Remote sensing
- 2) The IC commonly used in decoration lighting is _____.
 - a) IC-741
 - b) IC-555
 - c) IC-4011
 - d) IC-7805
- 3) PIR sensor is mainly used for _____.
 - a) Detecting motion
 - b) Detecting motion
 - c) Switching AC supply
 - d) Burglar alarm only
- 4) RTD is used in _____.
 - a) Tube light
 - b) Automatic water heater
 - c) Fan regulator
 - d) Decoration lights
- 5) The LM-35 is a _____.
 - a) Temperature sensor
 - b) Motion detector
 - c) Burglar alarm
 - d) Relay driver
- 6) The main application of an LDR is _____.
 - a) Speed control
 - b) Burglar alarm
 - c) Decoration lighting
 - d) Battery charging

Q.2 Answer the following questions. (Any Three)

06

- a) Explain the working of a mobile charger power supply.
- b) Write a note on transistor as a switch.
- c) State the use of IR transmitter and receiver in remote control applications.
- d) Explain PIR sensor application.
- e) Write the use of LED lighting strips.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Describe the application of solar cells in charging batteries.
 - b) Explain RTD and its application in temperature control.
 - c) Describe LM-35 temperature sensor with fan speed control.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain On/Off control using transistor and relay.
 - b) Explain burglar alarm using LDR.
 - c) Describe the use of infrared transmitter-receiver in solenoid valve control.
- Q.5 Answer the following question. (Any One) 06**
- a) Describe LED lighting system using timer IC-555 with diagram.
 - b) Explain the working of a TV remote-control application in appliances.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
MICROBIOLOGY
Human Health and Hygiene (G04-GE-OE-106)**

Day & Date: Thursday, 23-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative. (MCQ) 06

- 1) Which of the following factor is necessary for a healthy person?
 - a) Personal hygiene
 - b) Proper diet
 - c) Vaccination
 - d) All of the above

- 2) Poor sanitation leads to _____.
 - a) Improved health
 - b) Disease
 - c) Good smell
 - d) Improved social status

- 3) The causative agent of Tuberculosis is _____.
 - a) Virus
 - b) Bacterium
 - c) Malnutrition
 - d) Protozoan

- 4) Germs live in _____.
 - a) Dust
 - b) Water
 - c) Air
 - d) All of these

- 5) The main symptom of Tuberculosis is formation of _____.
 - a) Liquid
 - b) Scar
 - c) Lump
 - d) Tubercle

- 6) The vector of Malarial parasite is _____.
 - a) Hen
 - b) Dog
 - c) Mosquito
 - d) Cat

Q.2 Answer the following questions. (Any Three) 06

- a) What is Containment?
- b) Define Health.
- c) What is hygiene?
- d) Define Food poisoning.
- e) Define Normal Flora.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain how personal hygiene should be maintained.
 - b) Write a note on air borne diseases.
 - c) What is national health mission?
- Q.4 Answer the following questions. (Any Two) 06**
- a) Give the importance of health education.
 - b) Write a short note on water borne diseases.
 - c) Preventive measures of influenza.
- Q.5 Answer the following question. (Any One) 06**
- a) Write in details on diseases transmitted through physical contact.
 - b) Describe the preventive and control measures of Cholera and Typhoid.

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
GEOGRAPHY
Geography of Maharashtra - I (G04-GE-OE-107)**

Day & Date: Thursday, 23-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Rewrite the sentences by choosing the correct alternative. 06

- 1) _____ km. length of coastline is lesser with the state of Maharashtra.

a) 800	b) 920
c) 720	d) 600

- 2) The area of Maharashtra state ranks _____ in India.

a) 3 rd	b) 4 th
c) 1 st	d) 6 th

- 3) _____ river is longest river in Maharashtra.

a) Tapi	b) Krishna
c) Godavari	d) Bhima

- 4) The longest area in Maharashtra is under _____ soil.

a) Red	b) Alluvial
c) Laterite	d) Regur

- 5) Bombay High is famous for _____ resources.

a) Coal	b) Petroleum
c) Iron ore	d) Bauxite

- 6) _____ is the highest peak in Maharashtra.

a) Mahabaleshwar	b) Bhimashankar
c) Kalsubai	d) Torana

Q.2 Answer the following questions. (Any Three) 06

- a) State the location of Maharashtra.
- b) What are the five rivers of Maharashtra?
- c) How many types of soil are there in Maharashtra?
- d) Which type of climate found in Maharashtra, write two lines about it.
- e) Where is bauxite found in Maharashtra?

- Q.3 Write short Notes. (Any Two) 06**
- a) Write information on Monsoon season in Maharashtra
 - b) Explain soil conservation
 - c) State the importance of Iron ore
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain the distribution of soil in Maharashtra.
 - b) State the importance of Bauxite.
 - c) Describe the Godavari river basin in Maharashtra
- Q.5 Answer the following question. (Any One) 06**
- a) State the causes and salutation of soil degradation in Maharashtra.
 - b) Describe the various types of vegetation in Maharashtra.

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
GEOLOGY
Natural Hazards and Disaster Management (G04-GE-OE-109)**

Day & Date: Thursday, 23-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative. (MCQ) 06

- 1) _____ is the type natural disaster.

a) human war	b) explosion
c) Earthquake	d) Bom blast

- 2) _____ can be defined as the eruption of magmatic material on the earth surface.

a) Earthquake	b) flood
c) volcano	d) cyclone

- 3) Causes of landslide is due to _____.

a) Earthquake	b) weak rock material
c) heavy rainfall	d) All of these

- 4) Most abundant gas relies from volcano is _____.

a) CO ₂	b) Water vapour
c) Sulphur	d) None of these

- 5) Causes of volcano is due to _____.

a) Deficit rainfall	b) over population
c) tectonics	d) All of these

- 6) The term _____ includes cyclones.

a) tornado	b) hurricanes
c) typhoon	d) All of these

Q.2 Answer the following. (Any Three) 06

- a) Define term disaster?
- b) What is earthquake?
- c) What are natural hazards?
- d) Explain causes of volcano.
- e) Write about disaster risk.

- Q.3 Answer the following questions. (Any Two) 06**
- a) What is landslide? How to predict from landslide.
 - b) Define volcano? Describe types of volcano.
 - c) Describe the flood management.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Describe disaster management cycle.
 - b) Describe risk reduction measures of forest fire.
 - c) Describe the product of volcano.
- Q.5 Answer the following question. (Any One) 06**
- a) Describe the prediction, precaution and control measures of earthquake.
 - b) Describe risk reduction measures of drought.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
ENVIRONMENTAL SCIENCE
Earth and Earth Surface (G04-GE-OE-112)**

Day & Date: Thursday, 23-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative.

06

- 1) What is the primary cause of sea floor spreading?
 - a) Movement of ocean currents
 - b) Plate tectonics
 - c) Volcanic activity on the ocean floor
 - d) Erosion of sea beds

- 2) Which of the following is an example of a rock-forming mineral?

a) Quartz	b) Pyrite
c) Diamond	d) Gold

- 3) The supercontinent Pangaea existed during which geological era?

a) Cenozoic	b) Mesozoic
c) Paleozoic	d) Precambrian

- 4) The atmosphere is primarily composed of which gas?

a) Oxygen	b) Nitrogen
c) Carbon dioxide	d) Argon

- 5) Which of the following mountain systems is part of the Peninsular Indian Mountain range?

a) Himalayas	b) Western Ghats
c) Andes	d) Alps

- 6) The Indo-Gangetic Plains were formed primarily due to _____.

a) Volcanic activity	b) Glacial deposition
c) River sedimentation	d) Tectonic uplift

Q.2 Answer the following. (Any Three)

06

- a) Define the chemical composition of Earth's crust.
- b) What is the geological time scale?
- c) What is the composition of Earth's atmosphere?
- d) Define the atmosphere-ocean interface with examples.
- e) What is continental drift theory?

- Q.3 Answer the following. (Any Two) 06**
- a) Name the major peninsular mountain ranges in India.
 - b) How are perennial river systems different from seasonal ones?
 - c) Name any two rock-forming minerals.
- Q.4 Answer the following. (Any Two) 06**
- a) List any two differences between oceanic and continental crust.
 - b) What is orogeny? Give an example.
 - c) What are the Vindhyan and Aravalli ranges?
- Q.5 Answer the following. (Any One) 06**
- a) Write a detailed account of glaciers, their types, and their role in geomorphology.
 - b) Explain the types, structures, and characteristics of rocks.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
English/English for communication (ENG-101)**

Day & Date: Friday, 24-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options.

06

- 1) What is the primary purpose of communication?
 - a) To avoid interactions
 - b) To share ideas, information, and emotions
 - c) To maintain silence
 - d) To create confusion

- 2) What is a key characteristics of clear communication?
 - a) Using Jargon
 - b) Being vague
 - c) Using simple language
 - d) Being lengthy

- 3) Which barrier is caused by different culture backgrounds?
 - a) Technological
 - b) Organizational
 - c) Cultural
 - d) Physical

- 4) What is a key benefit of arriving early for an interview?
 - a) Impressing the receptionist
 - b) Reviewing last-minute notes
 - c) Giving yourself time to relax
 - d) Finding a better parking point

- 5) What is the main purpose of group discussion?
 - a) To access individual communication skills
 - b) To evaluate one's appearance
 - c) To access team work and leadership skills
 - d) To identify the smart participant

- 6) What should be avoided in a group discussion?
 - a) Making eye contact
 - b) Interrupting others
 - c) Summarizing key point
 - d) Giving structured arguments

- Q.2 Answer the following. (Any Two) 06**
- a) State the significant role to use simple and clear language in communication.
 - b) Write in brief the role of Feedback in the communication process.
 - c) Explain the difference between Verbal and Non-verbal communication?
 - d) Use of technology in communication and teamwork.
- Q.3 Write Short Notes. (Any One) 06**
- a) Describe the 7 CS of communication and explain their importance.
- OR**
- b) Describe the communication process and its components.
- Q.4 Broad Question. (Any One) 12**
- a) Write a sample interview for the post of Sales Manager, including an introduction, question about the candidates experience and specific skills required for the role.
- OR**
- b) What are the key Do's and Don'ts in Group Discussion?

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Set **P**

B.Sc. (Plain) (सत्र - I) (नवीन) (NEP CBCS) परीक्षा:

मार्च/एप्रिल – २०२६

Constitution of India/ Indian Constitution and Democracy (ICD)

वार, दिनांक: शुक्रवार, २४-०४-२०२६

कमाल गुण: ३०

वेळ: दुपारी १२:०० ते ०१:३०

सूचना : १) सर्व प्रश्न अनिवार्य आहेत.
२) उजवीकडील अंक पूर्ण गुण दर्शवितात.

- प्र.१ अ) खालील दिलेले योग्य पर्याय निवडून गाळलेल्या जागा भरा. ०४
- १) भारतीय घटना परिषदेचे अध्यक्ष ——— हे होते.
अ) पंडित जवाहरलाल नेहरू ब) सरदार वल्लभभाई पटेल
क) डॉ. बाबू राजेन्द्रप्रसाद ड) डॉ. जॉन मथाई
- २) भारताने ——— शासनपद्धती स्वीकारलेली आहे.
अ) संसदीय ब) अध्यक्षीय
क) संमिश्र ड) सर्वकष
- ३) भारत हे ——— राज्य आहे.
अ) धार्मिक ब) धर्मनिरपेक्ष
क) धर्मबाह्य ड) धर्माधिष्ठीत
- ४) भारतीय घटना मसुदा समितीचे अध्यक्ष ——— हे होते.
अ) पंडित जवाहरलाल नेहरू ब) सरदार वल्लभभाई पटेल
क) डॉ. बाबू राजेन्द्रप्रसाद ड) डॉ. बाबासाहेब आंबेडकर
- ब) चूक कि बरोबर ते लिहा. ०२
- १) भारतीय राज्यघटनेनुसार २५ वर्षे पूर्ण झालेल्या सर्व नागरिकांना मतदानाचा अधिकार दिला आहे.
२) भारताने प्रत्यक्ष लोकशाहीची पद्धत स्वीकारलेली आहे.
- प्र.२ खालील प्रश्नाचे उत्तर लिहा. ०६
- अ) धर्मनिरपेक्ष राज्य
ब) राज्यघटनेतील समता

- प्र.३ खालील प्रश्नाचे उत्तर लिहा. 0६
भारतीय निवडणूक आयोगाची रचना व अधिकार सांगा.
- प्र.४ खालील प्रश्नाचे उत्तर द्या. (कोणताही एक) 0६
अ) भारतीय राज्यघटनेच्या सरनाम्याचे स्वरूप व महत्त्व सांगा.
किंवा
ब) लोकशाहीची व्याख्या सांगून लोकशाहीचे प्रकार स्पष्ट करा.
- प्र.५ खालील प्रश्नाचे उत्तर द्या. (कोणताही एक) 0६
अ) भारतीय राज्यघटनेची प्रमुख वैशिष्ट्ये स्पष्ट करा.
किंवा
ब) भारतीय निवडणुका व मतदार जागृती कार्यक्रमावर भाष्य करा.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
Constitution of India/ Indian Constitution and Democracy (ICD)**

Day & Date: Friday, 24-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 A) Choose the correct alternative from the options. 04

- 1) The Chairman of the Indian Constituent Assembly was _____.
 - a) Pandit Jawaharlal Nehru
 - b) Sardar Vallabhbhai Patel
 - c) Dr. Babu Rajendra Prasad
 - d) Dr. John Mathai

- 2) India has adopted the _____ system of government.

a) Parliamentary	b) Presidential
c) Mixed	d) Comprehensive

- 3) India is a _____ state.

a) Religious	b) Secular
c) Irreligious	d) Theocratic

- 4) The Chairman of the Drafting Committee of the Indian Constitution was _____.
 - a) Pandit Jawaharlal Nehru
 - b) Sardar Vallabhbhai Patel
 - c) Dr. Babu Rajendra Prasad
 - d) Dr. Babasaheb Ambedkar

B) True or False. 02

- 1) According to the Indian Constitution, all citizens who have completed 25 years of age have been given the right to vote.
- 2) India has adopted the system of direct democracy.

Q.2 Answer the following questions. 06

- a) Secular State
- b) Equality in the Constitution

Q.3 Answer the following questions. 06

Explain the structure and powers of the Election Commission of India.

Q.4 Attempt the following questions. (Any One) 06

a) Explain the nature and importance of the Preamble of the Indian Constitution.

OR

b) Define democracy and explain the types of democracy.

Q.5 Attempt the following questions. (Any One) 06

a) Explain the major features of the Indian Constitution.

OR

b) Write a note on Indian elections and voter awareness programmes.

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B.Sc. (Plain) (सत्र – I) (नवीन) (NEP CBCS) परीक्षा:
मार्च/एप्रिल – २०२६
Indian Knowledge System/ General IKS (IKS-101)

वार, दिनांक: शनिवार, २५-०४-२०२६
वेळ: सकाळी ०९:०० ते १०:३०

कमाल गुण: ३०

- सूचना :** १) सर्व प्रश्न अनिवार्य आहेत.
२) उजवीकडील अंक पूर्ण गुण दर्शवितात.
३) आवश्यकतेनुसार नीटशा आकृती काढा आणि आवश्यक समीकरणे लिहा.

प्र.१ खालील दिलेले योग्य पर्याय निवडून गाळलेल्या जागा भरा.

०६

- १) प्राचीन भारतीय पर्यावरणीय पद्धतींमध्ये ——— पवित्र मानले जात होते आणि संरक्षित केले जात होते.
अ) नद्या आणि जंगले ब) फक्त प्राणी
क) फक्त पर्वत ड) फक्त पक्षी
- २) IKS चे वर्णन ——— असे केले जाते.
अ) एकसंध, एकत्रित ज्ञान प्रणाली
ब) विविध, पारंपरिक ज्ञान प्रणालींचा संग्रह
क) ज्ञानाकडे आधुनिक, वैज्ञानिक दृष्टिकोन
ड) ज्ञानाशी असंबंधित अध्यात्मिक पद्धत
- ३) भारतीय ज्ञान प्रणाली मुख्यतः दोन प्रकारच्या परंपरांवर आधारित आहे, त्या आहेत ———.
अ) पाश्चात्य आणि पूर्वीय
ब) वैदिक आणि अवैदिक
क) आधुनिक आणि उत्तर – आधुनिक
ड) वैज्ञानिक आणि साहित्यिक
- ४) ——— हे प्राचीन भारतीय विद्यापीठ चीनसह आंतरराष्ट्रीय विद्वानांना आकर्षित करत होते.
अ) विक्रमशिला ब) नालंदा
क) जगदल ड) उज्जैन
- ५) खालीलपैकी ——— प्राचीन भारतीय विचारवंत अणुवाद (Atomic Theory) या संकल्पनेशी संबंधित आहेत.
अ) आर्यभट्ट ब) कणाद
क) भास्कराचार्य ड) पतंजली

- ६) खालीलपैकी — हे प्राचीन भारतीय रसायनशास्त्राचे योगदान नाही.
 अ) नैसर्गिक रंग व रंगरेषा ब) आधुनिक प्लास्टिक
 क) मातीची भांडी व कांचनिर्मिती ड) धातुकर्म

- प्र.२ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही तीन) 0६
- अ) नालंदा विद्यापीठाच्या कोणत्याही दोन वैशिष्ट्यांची नोंद करा.
 ब) मातीची भांडी यासंबंधित भारतीय संकल्पनांबाबत लिहा.
 क) ज्ञान प्रसारात योगदान देणाऱ्या उल्लेखनीय माजी विद्यार्थ्यांची नावे लिहा.
 ड) पर्यावरणशास्त्र (Ecology) याची व्याख्या लिहा.
 इ) अवैदिक तत्त्वज्ञान प्रणाली म्हणजे काय?
- प्र.३ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही दोन) 0६
- अ) भारतीय वैज्ञानिक परंपरांचे मूलभूत संकल्पना थोडक्यात समजावून सांगा.
 ब) शरीररचना व कार्यशास्त्र (Anatomy and Physiology) यावरील पारंपरिक दृष्टिकोन समजावून सांगा.
 क) प्रकाशाच्या रहस्यांशी संबंधित भारतीय संकल्पना स्पष्ट करा.
- प्र.४ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही दोन) 0६
- अ) पर्यावरणीय शाश्वततेवर भारतातील पारंपरिक भर स्पष्ट करा.
 ब) वैदिक गणितावर थोडक्यात माहिती द्या.
 क) गणितीय व सांख्यिकी संकल्पनांमधील भारतीय मूळ स्पष्ट करा.
- प्र.५ खालील प्रश्नाचे उत्तर लिहा. (कोणताही एक) 0६
- अ) दैनंदिन जीवनातील रसायनशास्त्रातील भारतीय नवोपक्रम समजावून सांगा.
 ब) पर्यावरण संवर्धनासाठी प्राचीन भारतीय पद्धतींबाबत नोंद लिहा.

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
Indian Knowledge System/ General IKS (IKS-101)**

Day & Date: Saturday, 25-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams and give necessary equations whenever necessary.

Q.1 Choose the correct alternative from the options.**06**

- 1) _____ was considered sacred and protected in ancient Indian environmental practices.
 - a) Rivers and forests
 - b) Only animals
 - c) Only mountains
 - d) Only birds

- 2) IKS is described as _____.
 - a) a single, unified system of knowledge
 - b) a collection of diverse, traditional, knowledge systems
 - c) a-modern, scientific approach to knowledge
 - d) a spiritual practice unrelated to knowledge

- 3) The Indian Knowledge System is primarily derived from two types of traditions they are _____.
 - a) Western and Eastern
 - b) Vedic and Non-Vedic
 - c) Modern and Post-modern
 - d) Scientific and Literary

- 4) _____ ancient Indian university was famous for attracting international scholars, including those from China.
 - a) Vikramashila
 - b) Nālandā
 - c) Jagaddala
 - d) Ujjain

- 5) _____ among the following ancient Indian thinkers is associated with atomic theory.
 - a) Aryabhata
 - b) Kanada
 - c) Bhaskaracharya
 - d) Patanjali

- 6) _____ is not a contribution of ancient Indian chemistry.
 - a) Natural dyes and paints
 - b) Modern plastics
 - c) Pottery and glass-making
 - d) Metallurgy

- Q.2 Answer the Following. (Any Three) 06**
- a) Write any two characteristics of Nalanda.
 - b) Write about Indian concepts related to pottery.
 - c) Write names of notable alumni who contributed to the spread of knowledge.
 - d) Define Ecology.
 - e) What is non-Vedic philosophical systems?
- Q.3 Answer the following. (Any Two) 06**
- a) Describe in brief the Foundational concepts of Indian Scientific traditions.
 - b) Explain the traditional perspectives on Anatomy and physiology.
 - c) Explain the Indian concepts related to mystery of light.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain India's traditional emphasis on environmental sustainability.
 - b) Brief note on Vedic Mathematics.
 - c) Explain the Indian origin in foundational mathematical and statistical concepts.
- Q.5 Answer the following. (Any One) 06**
- a) Explain Indian innovations in daily-life chemistry.
 - b) Write a note on Ancient practices that promote environmental stewardship.

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
PHYSICS – I
Mechanics and Properties of Matter (G04-0101)**

Day & Date: Monday, 27-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of log table or calculator is allowed
4) Draw neat labeled diagrams wherever necessary.

Q.1 Choose correct alternative. 06

- 1) Moment of Inertia of same size discs made up of iron and gold, about the same axis are _____.
 - a) different
 - b) same
 - c) depends on temperature
 - d) nearly equal

- 2) The length of an equivalent simple pendulum is also called as _____ of the compound pendulum.
 - a) equal length
 - b) reduced length
 - c) extended length
 - d) suspension length

- 3) Detergents are used for washing the clothes because _____.
 - a) water becomes clean due to detergent
 - b) density of water decreases by dissolving detergent in water
 - c) surface tension of water decreases by adding the detergent
 - d) detergent spreads natural odour on the clothes

- 4) Kinetic energy per unit mass of the liquid is _____.
 - a) $\frac{1}{2}v^2$
 - b) $\frac{1}{2}mv^2$
 - c) $\frac{1}{2}\rho^2$
 - d) $\frac{1}{2}mv$

- 5) Moment of inertia of the body is not dependent on _____.
 - a) mass of the body
 - b) distance from the axis of rotation
 - c) density of material of body
 - d) height from the sea level

- 6) Which of the following factors affect the viscosity of liquid?
- a) pressure and temperature
 - b) mass and volume
 - c) magnetic field and magnetic moment
 - d) All a, b, c

Q.2 Answer the questions in brief. (Any Three)**06**

- a) Define coefficient of viscosity. State its units & dimensions.
- b) What is angle of contact?
- c) Define coefficient of elasticity. Give its SI and CGS units.
- d) What are adhesive and cohesive forces?
- e) Explain Reynold's number.

Q.3 Answer the following. (Any Two)**06**

- a) Derive an expression for moment of inertia of a circular disc about an axis passing through its centre and perpendicular to its plane.
- b) Write a note on Torsional pendulum.
- c) Water flows through a horizontal pipe line of varying cross section. If the pressure of water is 66640 dynes/cm^2 where the velocity of flow is 25 cm/s , what will be the pressure where the velocity of flow is 40 cm/s ?

Q.4 Answer the following. (Any Two)**06**

- a) Derive an expression for the moment of inertia of a rectangular lamina about an axis passing through its center and parallel to its breadth.
- b) Define compound pendulum. Show that the motion of compound pendulum performs angular S.H.M.
- c) Rubber tube of 100 cm long and internal diameter 2.62 cm is suspended vertically. Initially, volume of water inside the tube was 260 cc . If 500 gm weight is attached to its free end, it gets elongated and laterally contracted. The length of tube and volume of tube is measured 111.2 cm and 272 cc respectively after loading by 500 gm wt. Then find its Poisson's ratio.

Q.5 Answer the following. (Any One)**06**

- a) Derive the relation between excess pressure and surface tension in reference with liquid drop and soap bubble.
- b) Show that shear strain is equivalent to extension and compression strains.

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
CHEMISTRY – I
Physical and Inorganic Chemistry (G04-0102)**

Day & Date: Tuesday, 28-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat-labeled diagrams wherever necessary.
4) Use of Log table and Calculator is allowed.
(At. Wts.: H=1, C=12, O=16, N=14, Na=23, Cl=35.5)

Q.1 Choose correct alternative. (MCQ) 06

- 1) The real gases show nearly ideal behaviour at _____.
a) low pressure and high temperature
b) high pressure and high temperature
c) high pressure and low temperature
d) low pressure and low temperature
- 2) The half life time for second order reaction is given as _____.
a) 1
b) $1/ka$
c) $3/2ka^2$
d) $0.693/3$
- 3) The bond formed by sharing of unpaired electrons is called as _____ bond.
a) Metallic
b) ionic
c) Covalent
d) co-ordinate
- 4) MOT is discussed on the principle of _____.
a) LCAO approximation
b) Aufbau process
c) Pauli's exclusion principle
d) Pearson's principle
- 5) The geometry of SiCl_4 molecule is _____.
a) Trigonal
b) tetrahedral
c) square planar
d) square planar pyramidal
- 6) The bond order of CO molecule is _____.
a) One
b) two
c) Three
d) four

Q.2 Answer the following questions. (Any Three) 06

- a) Define order of a chemical reaction.
- b) What is excluded volume for a gas?
- c) What do you mean by critical temperature?
- d) Give any two assumptions of VSEPR theory.
- e) Give the conditions for successful overlap of atomic orbitals.

- Q.3 Write short notes on any two of the following. 06**
- a) Liquefaction of gases
 - b) Ionic Bonding
 - c) Non-bonding orbitals
- Q.4 Answer the following. (Any Two) 06**
- a) What are the causes for real gas deviation from ideal behaviour. Explain.
 - b) Explain in brief sp hybridization.
 - c) Distinguish between ideal and non-ideal gas.
- Q.5 Answer the following. (Any One) 06**
- a) Derive the expression for the velocity constant of first order reaction.
 - b) With the help of MO diagram, explain bond order, stability and magnetic character of NO molecule.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April - 2026
MATHEMATICS (Paper - I)
Algebra and Calculus (G04-0110)**

Day & Date: Wednesday, 29-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options.

06

- 1) The characteristic equation of the matrix $\begin{bmatrix} 3 & 5 \\ -2 & -4 \end{bmatrix}$ is _____
- a) $\lambda^2 - \lambda + 2 = 0$ b) $\lambda^2 + 2\lambda - 2 = 0$
c) $\lambda^2 - \lambda - 2 = 0$ d) $\lambda^2 + \lambda - 2 = 0$
- 2) For matrix $A = \begin{bmatrix} 1 & 0 & 0 \\ -1 & 2 & 0 \\ 4 & 0 & 3 \end{bmatrix}$, the Eigen values of A are _____
- a) $-1, -2, -3$ b) $2, 2, 2$
c) $2, -3, 1$ d) $1, 2, 3$
- 3) For what value of k , the homogeneous system $x + 2y - z = 0$,
 $3x + 8y - 3z = 0, 2x + 4y + (k - 3)z = 0$ has infinitely many solutions?
- a) $k = 0$ b) $k = 1$
c) $k = 2$ d) $k = 3$
- 4) Polar form of the complex number $\frac{1}{2} + i\frac{\sqrt{3}}{2}$ is _____
- a) $\cos\frac{\pi}{3} + i\sin\frac{\pi}{3}$ b) $\cos\frac{\pi}{3} - i\sin\frac{\pi}{3}$
c) $\frac{1}{2}\left(\cos\frac{\pi}{3} + i\sin\frac{\pi}{3}\right)$ d) $\frac{1}{2}\left(\cos\frac{\pi}{3} - i\sin\frac{\pi}{3}\right)$
- 5) The n^{th} derivative of the function $y = 2^x$ is _____
- a) $2^n(\log 2)^x$ b) $\frac{2^x}{(\log 2)^n}$
c) $\frac{(\log 2)^n}{2^x}$ d) $2^x(\log 2)^n$
- 6) For the scalar function Φ , $\text{curl}(\text{grad } \Phi) =$ _____
- a) $\nabla\Phi$ b) $\nabla^2\Phi$
c) 0 d) 1

Q.2 Answer the following. (Any Three)

06

- a) Find the rank of the matrix $\begin{bmatrix} 1 & 3 & 4 & 5 \\ 1 & 2 & 6 & 7 \\ 1 & 5 & 0 & 10 \end{bmatrix}$
- b) Simplify $\frac{(\cos 8\theta + i \sin 8\theta)^5}{(\cos 5\theta - i \sin 5\theta)^8}$
- c) Solve the system: $x - y + z = 0, x + 2y - z = 0, 2x + y + 3z = 0$
- d) If $z = e^{xy}$, then find $\frac{\partial^2 z}{\partial x^2}$ and $\frac{\partial^2 z}{\partial x \partial y}$
- e) Define Divergence and Curl.

Q.3 Answer the following. (Any Two)

06

- a) Find the Eigenvalue & Eigenvector of the matrix $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$
- b) Examine for consistency and solve if consistent equations
 $x + y + z = 6,$
 $2x + y + 3z = 13,$
 $5x + 2y + z = 12$
- c) State and Prove Euler's theorem on homogenous functions.

Q.4 Answer the following. (Any Two)

06

- a) Find all the Values of $(-1)^{1/4}$.
- b) If $y = e^{mx}$, then find the n^{th} derivative of y .
- c) Show that the vector field $\vec{F} = \frac{-y\hat{i} + x\hat{j}}{x^2 + y^2}$ is irrotational.

Q.5 Answer the following. (Any One)

06

- a) State and prove De-Moivre's theorem.

- b) If $u = \operatorname{cosec}^{-1} \sqrt{\frac{x^{1/2} + y^{1/2}}{x^{1/3} + y^{1/3}}}$ then show that

$$x^2 u_{xx} + 2xy u_{xy} + y^2 u_{yy} = \frac{\tan u}{144} (13 + \tan^2 u)$$

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April- 2026
MICROBIOLOGY
Basics in Microbiology (G04-0106)**

Day & Date: Wednesday, 29-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat labeled diagram wherever necessary.

Q.1 Choose the correct alternatives.**06**

- Swan necked flask was discovered by _____.
 - Edward Jenner
 - Francisco Redii
 - Louis Pasteur
 - John Tyndall
- Alcohol, wine and beer production comes under _____ microbiology.
 - industrial
 - air
 - water
 - space
- National Research Center on Pomegranate (NRCP) is located at _____.
 - Pune
 - Solapur
 - Chandigarh
 - Hyderabad
- _____ is example of prokaryotic cell.
 - algae
 - protozoa
 - yeast and mold
 - Bacteria
- Gram positive bacteria look _____ after Gram staining.
 - violet
 - yellow
 - pink
 - orange
- According to Binomial nomenclature the first word is the _____ name.
 - species
 - genus
 - family
 - order

Q.2 Answer the following. (Any Three)**06**

- What is biogenesis?
- What is microscope?
- Enlist the arrangements in cocci shaped bacteria.
- Enlist the culture characteristics of bacteria used in classification and identification.
- Who discovery antibiotic penicillin?

- Q.3 Answer the following. (Any Two) 06**
- a) Write on the structure and function of bacterial cell membrane.
 - b) Describe in detail general characteristics of viruses.
 - c) Explain in detail about any two National Institutes related to Microbiology in India.
- Q.4 Answer the following. (Any Two) 06**
- a) Write the difference between prokaryotic and eukaryotic cells.
 - b) Describe in detail shapes of bacteria with examples.
 - c) Explain in detail theory of spontaneous generation.
- Q.5 Answer the following. (Any One) 06**
- a) Write in detail on Branches of Microbiology.
 - b) Explain in detail structure and functions of Gram positive cell wall of Bacteria.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
Statistics – I
Descriptive Statistics (G04-0111)**

Day & Date: Thursday, 30-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of Calculator is allowed.

Q.1 Choose the correct alternatives.

06

- 1) The limiting form of a histogram when class intervals are made very small is _____.
 - a) Frequency curve
 - b) Frequency polygon
 - c) Ogive curve
 - d) Pie diagram
- 2) The arithmetic mean of first n natural number is _____.
 - a) $\frac{n(n+1)}{2}$
 - b) $\frac{n^2+1}{2}$
 - c) $\frac{n(n^2+1)}{2}$
 - d) $\frac{n^2+n}{2n}$
- 3) Second decile divides the data in the ratio: _____.
 - a) 1:2
 - b) 1:1
 - c) 1:4
 - d) 2:1
- 4) The variance of the first n natural numbers is 14, and then what is the value of n ?
 - a) 7
 - b) 9
 - c) 11
 - d) 13
- 5) The first three moments of a distribution about the mean are 0, 4 and 0. The distribution is _____.
 - a) Symmetrical
 - b) Skewed to the left
 - c) Skewed to the right
 - d) None of these
- 6) In a mesokurtic distribution _____.
 - a) $\beta_1 = 0$ and $\beta_2 = 3$
 - b) $\beta_1 = 3$ and $\beta_2 = 0$
 - c) $\beta_1 = 0$ and $\beta_2 > 3$
 - d) $\beta_1 = 0$ and $\beta_2 < 3$

- Q.2 Answer the following. (Any Three) 06**
- Define continuous variable and give one example of continuous variable.
 - Define A.M. and H.M.
 - Define quartile deviation and coefficient of quartile deviation.
 - Show that first central moment is zero.
 - Define positive skewness and negative skewness.
- Q.3 Answer the following. (Any Two) 06**
- Distinguish between inclusive and exclusive methods.
 - Show that the sum of squares of deviation taken from mean is minimum.
 - The first three moments of a distribution about the value $A = 20$ are 1, 4 and 10. Find value of β_1 .
- Q.4 Answer the following. (Any Two) 06**
- If 7, 4, 9 be the Arithmetic Mean of 3 groups containing 6, 2, 5 observations respectively, then find the Arithmetic Mean of all the 13 observations.
 - Show that Bowley's coefficient of skewness lies between -1 and $+1$.
 - State and prove effect of change of origin and scale on standard deviation.
- Q.5 Answer the following. (Any One) 06**
- Derive the formula for median in case of grouped frequency distribution.
 - Define M.D. about mean and S.D. For discrete frequency distribution show that S.D. is not less than M.D. from mean.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
BOTANY – I
Algae, Fungi and Archegoniate (G04-0103)**

Day & Date: Thursday, 30-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat and labeled diagram and give equations wherever necessary.
3) Figures to the right indicate full marks.
4) Use of logarithmic table and non-programmable calculator is allowed.

Q.1 Choose the correct alternatives from the options. 06

- 1) In Spirogyra, the scalariform conjugation occurs in _____ species.
 - a) dioecious
 - b) monoecious
 - c) homothallic
 - d) heterothallic
- 2) Sargassum reproduces sexually by _____ type.
 - a) Oogamous
 - b) Anisogamous
 - c) Isogamous
 - d) None of the above
- 3) _____ is called bread mould fungus.
 - a) Aspergillus
 - b) Penicillium
 - c) Mucor
 - d) Cercospora
- 4) Sexual reproduction in Riccia is _____.
 - a) Oogamous
 - b) anisogamous
 - c) isogamous
 - d) gamous
- 5) The Selaginella shows _____ sporophyte.
 - a) homosporous
 - b) heterosporous
 - c) Monosporous
 - d) tetrasporous
- 6) Presence of transfusion tissue is characteristic of Cycas _____.
 - a) leaflet
 - b) Root
 - c) stem
 - d) All of these

Q.2 Answer the following. (Any Three) 06

- a) Sketch and label the L.S. of strobilus in Selaginella.
- b) Give the division and class name of Sargassum.
- c) What is mycelium?
- d) Sketch and label T.S. of Riccia thallus.
- e) Classify the Cycas according to the classification given by Sporne.

- Q.3 Answer the following. (Any Two) 06**
- a) With labelled diagram describe the thallus structure of *Mucor*.
 - b) Describe the economic importance of pteridophytes.
 - c) Explain the economic importance of fungi.
- Q.4 Answer the following. (Any Two) 06**
- a) With labelled diagram describe the thallus structure of *Selaginella*.
 - b) Give brief account on sexual reproduction of *Riccia*.
 - c) Describe the economic importance of Gymnosperm
- Q.5 Answer the following. (Any One) 06**
- a) Explain in detail Life cycle of *Riccia*.
 - b) With labelled diagram describe the anatomy of leaflet of *Cycas*.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
ZOOLOGY – I
Animal Diversity- I Non-Chordates (G04-0104)**

Day & Date: Saturday, 02-05-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of Calculator is allowed.

Q.1 Choose the correct alternatives from the options. 06

- 1) Which of the following is NOT characteristics of phylum porifera?

a) Multicellular	b) Presence of body cavity
c) No true tissue or organs	d) Aquatic organism

- 2) In which group does the organism *Ascaris lumbricoides* belongs?

a) Nematelminthes	b) Platyhelminthes
c) Porifera	d) Mollusca

- 3) Hydra belongs to phylum _____.

a) Porifera	b) Protozoa
c) Cnidaria	d) Annelida

- 4) Water Vascular system is characteristics feature of _____ phylum.

a) Protozoa	b) Porifera
c) Mollusca	d) Echinodermata

- 5) The main characteristics feature of phylum Mollusca is _____.

a) Segmented body	b) soft bodied animal
c) Jointed appendages	d) Microscopic & unicellular

- 6) *Taenia solium* is an example of _____.

a) Free living parasite	b) Ectoparasite
c) Endo parasite	d) All of the above

Q.2 Answer the following. (Any Three) 06

- a) Describe classification of phylum protozoa.
- b) Economic importance of insect.
- c) Classification of phylum porifera up to class level.
- d) General characters of phylum Arthropoda.
- e) *Ascaris lumbricoides*.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain parasitic adaptations of *Ascaris lumbricoides*.
 - b) Describe reproduction in hydra.
 - c) Economic Importance of Leech.
- Q.4 Answer the following. (Any Two) 06**
- a) General characters of phylum Echinodermata.
 - b) General characters of phylum Cnidaria
 - c) Life cycle of *Taenia solium*.
- Q.5 Answer the following. (Any One) 06**
- a) Describe water vascular system of sea-star
 - b) Explain Life cycle of *Ascaris lumbricoides*

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
Environmental Science - II
Introduction to the Environment (G04-0112)**

Day & Date: Saturday, 02-05-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks

Q.1 Choose the correct alternatives. (MCQ)

06

- 1) Which of the following is a key goal of environmental science?
 - a) To increase industrial growth only
 - b) To understand and solve environmental problems
 - c) To invent new gadgets
 - d) To study ancient civilizations

- 2) The Earth's crust is _____.
 - a) The thickest layer
 - b) The thinnest outermost layer
 - c) Completely liquid
 - d) Found below the core

- 3) Which of the following fields is closely related to environmental science?
 - a) Astronomy
 - b) Ecology
 - c) Literature
 - d) Mathematics

- 4) Which layer of the Earth is liquid?
 - a) Crust
 - b) Mantle
 - c) Outer core
 - d) Inner core

- 5) The lithosphere includes _____.
 - a) The crust and the upper mantle
 - b) The core
 - c) Only the inner core
 - d) The outer core

- 6) What is the innermost layer of the Earth called?
 - a) Crust
 - b) Mantle
 - c) Outer core
 - d) Inner core

- Q.2 Answer the following. (Any Three) 06**
- a) Discuss Functions of Environment.
 - b) Discuss Concept of Biosphere.
 - c) Write details of Atmospheric Equilibrium.
 - d) Discuss rock forming minerals with examples.
 - e) Explain relation between atmospheric pressure and wind.
- Q.3 Answer the following. (Any Two) 06**
- a) Write a note on sea floor spreading.
 - b) Explain types of rocks with examples.
 - c) Explain weathering and soil formation
- Q.4 Answer the following. (Any Two) 06**
- a) Write a note on evolution of earth's atmosphere.
 - b) Describe physical and chemical properties of soil.
 - c) Write a note on macro and micro plant nutrients.
- Q.5 Answer the following. (Any One) 06**
- a) Write details of multidisciplinary nature of environmental science with examples.
 - b) Describe geological time scale in detail.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
Geology – I
General and Physical Geology (G04-0109)**

Day & Date: Monday, 04-05-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:**
- 1) All questions are compulsory.
 - 2) Draw neat and labelled diagram and give equations wherever necessary.
 - 3) Figures to the right indicate full marks.
 - 4) Use of logarithmic table and non-programmable calculator is allowed.

Q.1 Choose the correct alternatives. (MCQ)**06**

- 1) Which of the following is a Jovian planet?

a) Mercury	b) Earth
c) Jupiter	d) Mars

- 2) The shape of the Earth is best described as: _____.

a) Perfect Sphere	b) Ellipsoid
c) Cube	d) Flat Disk

- 3) Which of the following is **NOT** an exogenic process?

a) Weathering	b) Mass wasting
c) Erosion	d) Volcanism

- 4) Natural levees are formed due to: _____.

a) Deposition	b) Erosion and deposition both
c) Volcanism	d) Folding

- 5) The scientific study of earthquakes is called _____.

a) Volcanology	b) Seismology
c) Stratigraphy	d) Geomorphology

- 6) An erosional feature of wind is _____.

a) Deflation hollow	b) Seif
c) Sand dune	d) Loess

Q.2 Answer the following. (Any Three)**06**

- a) Write any two physical parameters of Earth.
- b) Define any two branches of geology?
- c) Write two products of volcanic eruption.
- d) Name two types of seismic waves.
- e) Define exogenic process.

- Q.3 Write short note OR answer the following. (Any Two) 06**
- a) Explain the typical structure of volcano with a neat, labelled diagram.
 - b) Explain frost action.
 - c) What is soil? draw Soil profile with neat, labeled diagram.
- Q.4 Answer the following. (Any Two) 06**
- a) Name two depositional features formed by a river.
 - b) Describe any two erosional features of ocean with suitable diagram.
 - c) Describe mushroom rock with neat, labeled diagram.
- Q.5 Answer the following. (Any One) 06**
- a) Describe inner and outer planets of Solar system.
 - b) Explain any three types of chemical weathering with suitable example.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
COMPUTER SCIENCE – I
Programming Using C (G04-0108)**

Day & Date: Monday, 04-05-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Multiple choice questions.**06**

- 1) C language is developed by _____.
 - a) Steve Jobs
 - b) James Gosling
 - c) Dennis Ritchie
 - d) Rasmus Lerdorf
- 2) All keywords in C are in _____.
 - a) Lower Case letters
 - b) Upper Case letters
 - c) Camel Case letters
 - d) None of the mentioned
- 3) scanf() is a predefined function in _____ header file.
 - a) Stdlib. h
 - b) ctype. h
 - c) stdio. h
 - d) stdarg. h
- 4) Array in C always start at _____.
 - a) -1
 - b) 1
 - c) 0
 - d) Value provided by user
- 5) Which loop is most suitable to first perform the operation and then test the condition?
 - a) for loop
 - b) while loop
 - c) do-while loop
 - d) none of the mentioned
- 6) Which keyword can be used for coming out of recursion?
 - a) break
 - b) return
 - c) exit
 - d) both break and return

Q.2 Answer the following. (Any Three)**06**

- a) Write the syntax of for loop statement.
- b) Define Array? write the syntax of array declaration
- c) Define local variable & global variable.
- d) Write the syntax of fopen() and fclose() function used in file handling.
- e) Define Recursion?

- Q.3 Answer the following. (Any Two) 06**
- a) Explain any one string function with example.
 - b) Write a program that check given number is odd or even using function
 - c) Explain data types used in c language.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain goto statement with example.
 - b) Define Structure? Explain with example.
 - c) Write a program in c to accept ten number from keyboard and to calculate the sum of that numbers.
- Q.5 Answer the following. (Any One) 06**
- a) Explain call by value and call by reference with example.
 - b) Write a program in C to copy one file into another file.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April - 2026
Geography- I
Geomorphology- (G04-0107)**

Day & Date: Tuesday, 05-05-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams and give equations wherever necessary.
4) Use of stencil is allowed.

Q.1 Choose the correct alternatives from the options. 06

- 1) _____ is the branch of science that dealt the evolution of landforms and their distribution on the earth surface.
 - a) Climatology
 - b) Geomorphology
 - c) Biogeography
 - d) Oceanography

- 2) _____ postulated the continental drift theory.
 - a) Hetner
 - b) Alfred Wegener
 - c) W.M Davis
 - d) E. Semple

- 3) Folded mountain and sea trenches have had been formed at the _____ boundary of plates.
 - a) divergent
 - b) transform
 - c) convergent
 - d) None of them

- 4) The _____ discontinuity is found in between SIAE and SIMA.
 - a) Mohovisic
 - b) Conrad
 - c) Guttenberg
 - d) None of them

- 5) A _____ fault is one in which the hanging wall moves downward in comparison with the adjoining footwall along the fault line.
 - a) normal
 - b) reverse
 - c) lateral
 - d) step

- 6) It is believed that all tectonic movements like earthquakes and volcanoes and earth movements originates from _____.
 - a) inner mantle
 - b) outer mantle
 - c) inner core
 - d) outer core

- Q.2 Answer the following. (Any Three) 06**
- a) Characteristics of primary waves of earthquakes
 - b) Interior temperature
 - c) Types of Earth Movement
 - d) Concept of folding
 - e) Name of various transition zones in interior earth
- Q.3 Answer the following. (Any Two) 06**
- a) Describe the types of fold.
 - b) State the causes of earthquakes.
 - c) Nature and Importance of geomorphology
- Q.4 Answer the following. (Any One) 06**
- a) Describe the scientific classification of interior earth.
 - b) Describe the concept of Wegener's continental drift theory.
- Q.5 Answer the following. (Any One) 06**
- a) Describe the types of faults.
 - b) Describe the various causes of Volcanoes.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
Electronics - I
Digital Fundamentals (G04-0105)**

Day & Date: Wednesday, 06-05-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.
4) Use of Logarithmic table and scientific calculator is allowed.

Q.1 Choose the correct alternative.

06

- 1) _____ number system is commonly used in the most of all digital systems.

a) Decimal	b) Octal
c) Binary	d) Duo decimal

- 2) For detecting the error in the binary bit _____ is used.

a) Excess-3 code	b) Gray code
c) BCD code	d) Parity bit

- 3) In Boolean algebra $A + \bar{A} =$ _____.

a) 1	b) 0
c) 2A	d) A

- 4) The full form of ASCII code is _____.

a) American Standard Code for Internet Interchange
b) American Standard Code for Information Interchange
c) American Standard Code for Information Interconnect
d) American Standard Code for Internet Interconnect

- 5) _____ gate is used as controlled inverter.

a) OR	b) AND
c) XOR	d) NOT

- 6) In a sign binary number representation minus sign is indicated by _____.

a) 0	b) parity
c) LSB	d) 1

- Q.2 Answer the following. (Any Three) 06**
- Define radix of number system. State radix of Decimal & Octal number system.
 - State Binary addition rule.
 - Convert decimal no (25) & (79) into BCD.
 - State four applications of XOR gate.
 - Draw the pin diagram of IC 7400.
- Q.3 Answer the following. (Any Two) 06**
- Draw logic diagram, symbol and write truth table of two input NOR gate.
 - Draw the logic diagram of Half adder and subtractor circuit.
 - Convert the $(48)_{10}$ into octal and Hexadecimal.
- Q.4 Answer the following. (Any Two) 06**
- State De Morgan's theorems with their logic equations.
 - Perform the BCD addition of $(98)_{10}$ and $(48)_{10}$.
 - Convert $(111110)_2$ into decimal and octal.
- Q.5 Answer the following. (Any One) 06**
- Why NOR/NAND gate is called as universal gate? Construct basic gate by using NOR gate.
 - Reduce the Boolean equation using K map

$$Y = \bar{A}\bar{B}CD + \bar{A}B\bar{C}\bar{D} + \bar{A}B\bar{C}D + \bar{A}BCD + \bar{A}BC\bar{D} + A\bar{B}CD + AB\bar{C}\bar{D} + AB\bar{C}D + ABCD + ABC\bar{D} + A\bar{B}\bar{C}D + \bar{A}\bar{B}\bar{C}D$$

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:
March/April – 2026
Data Science
Introduction to DBMS (G04-0113)**

Day & Date: Thursday, 07-05-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat labelled diagrams wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives. (MCQ)

06

- 1) The process of converting ER diagram to relational tables is called _____.
 - a) Normalization
 - b) Mapping
 - c) Decomposition
 - d) Denormalization
- 2) In a database table, a _____ is a collection of data fields.
 - a) Record
 - b) Field
 - c) Column
 - d) Degree
- 3) Sequential file organization stores records _____.
 - a) Randomly
 - b) Using hashing
 - c) In sorted order of key field
 - d) In B-tree order
- 4) A Functional Dependency (FD) is a relationship between _____.
 - a) Two tables
 - b) Two attributes
 - c) Two databases
 - d) Two schemas
- 5) Multi-valued dependencies are handled in which normal form?
 - a) 3NF
 - b) BCNF
 - c) 4NF
 - d) 5NF
- 6) _____ of the following is not a component of the DBMS environment?
 - a) Hardware
 - b) Software
 - c) People
 - d) Compiler

Q.2 Answer the following. (Any Three)

06

- a) List out different data model.
- b) What is check constraint?
- c) What is B and B+ trees.
- d) What is lossless decomposition?
- e) What is data independence?

- Q.3 Answer the following. (Any Two) 06**
- a) Explain ACID properties with example.
 - b) What is entity? Explain types of entities.
 - c) Explain 3-tier architecture.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain types of data independence.
 - b) Explain indexing for file in DBMS
 - c) Explain different types of relationship.
- Q.5 Answer the following. (Any One) 06**
- a) What is Normalization? Explain 1NF, 2NF, 3NF with example.
 - b) Explain Relational algebra with example.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April – 2026**

PHYSICS

Solar Energy and Solar Technology (G04-GE-OE-201)

Day & Date: Saturday, 04-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

- Instructions:**
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Draw neat-labeled diagrams wherever necessary.
 - 4) Use of Log table and Calculator is allowed.

Q.1 Multiple choice questions.

06

- 1) _____ is the most common material used to construct solar panels.

a) Silicon	b) Aluminum
c) Steel	d) Copper

- 2) The efficiency range of modern solar cells is _____.

a) 5% - 10%	b) 10% - 20%
c) 20% - 40%	d) 40% - 50%

- 3) _____ is the main component of a solar photovoltaic (PV) system that converts sunlight into electricity.

a) Solar cell	b) Battery
c) Inverter	d) Solar panel

- 4) _____ energy sources is directly linked to the Sun's radiation.

a) Solar	b) Biomass
c) Wind	d) Fossil fuels

- 5) _____ is the main principle behind the operation of a photovoltaic cell.

a) Nuclear fission	b) Electromagnetic induction
c) Thermal expansion	d) Photovoltaic effect

- 6) In solar cell, the conversion of sunlight into electricity occurs primarily due to the interaction of light with _____ material.

a) metal	b) insulator
c) semiconductor	d) conductor

- Q.2 Answer the following. (Any Three) 06**
- a) What are non-conventional energy sources? Give two examples.
 - b) What is solar radiation, and what are its main components?
 - c) List any two advantages of solar PV system.
 - d) What is photosynthesis?
 - e) Draw the typical solar V-I characteristics.
- Q.3 Answer the following. (Any Two) 06**
- a) Differentiate between primary and secondary energy sources with example.
 - b) Define the following terms,
 - i) Fill factor
 - ii) Open circuit voltage
 - iii) Short circuit current
 - c) Draw the labeled schematic view of box type solar cooker.
- Q.4 Answer the following (Any Two) 06**
- a) Write a short note on generation of photovoltaic cell.
 - b) Discuss advantages and disadvantages of solar PV system.
 - c) Explain the term air-mass.
- Q.5 Answer the following (Any One) 06**
- a) Explain the working principle of a solar dryer and describe the different type of solar drying system.
 - b) Discuss the role of energy in daily life and modern society.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
CHEMISTRY - II
Chemistry in Daily Life (G04-GE-OE-202)**

Day & Date: Saturday, 04-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options.**06**

- 1) Organic solvents found in paint removers are _____.
 - a) Acetone
 - b) Ethanol
 - c) Sodium hydroxide
 - d) Both a & b

- 2) _____ gas is commonly used in fire extinguishers to control fires.
 - a) Oxygen
 - b) Carbon Dioxide
 - c) Methane
 - d) Hydrogen

- 3) _____ is the major component of milk, comprising the highest percentage of its content.
 - a) Water
 - b) Protein
 - c) Fat
 - d) Vitamin

- 4) Yellow lead salt added to _____ as an adulterant.
 - a) milk
 - b) pulses
 - c) turmeric powder
 - d) chilli powder

- 5) For making the food products, use of inferior quality material which is unsafe for human consumption is called as _____.
 - a) poisoning
 - b) adulteration
 - c) contamination
 - d) None of the above

- 6) Appearance of blue colour after addition of iodine solution indicate adulteration of milk by _____.
 - a) water
 - b) starch
 - c) urea
 - d) formalin

Q.2 Answer the following. (Any Three)**06**

- a) Give any two toxic effects of antifreeze.
- b) Give any two flavors used in toothpaste with their roles.
- c) Describe a detection test of red brick powder in chilli powder.
- d) Explain adulteration test of urea in milk.
- e) What are bulking agents? Explain with one example.
- f) Define cosmetics and name any two cosmetic products.

- Q.3 Answer the following. (Any Two) 06**
- a) What is bleach? Give its toxicity.
 - b) How caffeine in coffee and tea is analyzed?
 - c) Write a note on artificial sweetening agent aspartame.
- Q.4 Answer the following (Any Two) 06**
- a) Define adulterants. Write a detection test of metanil yellow in turmeric powder.
 - b) Write a note on food viscosity builder.
 - c) Discuss common chemicals used in detergents and disinfectants and their uses.
- Q.5 Answer the following (Any One) 06**
- a) Explain in detail the chemical composition of milk.
 - b) Discuss permitted and non-permitted colours with three examples each.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
BOTANY
Floriculture & Landscape Architecture (G04-GE-OE-203)**

Day & Date: Saturday, 04-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

- Instructions:**
- 1) All questions are compulsory.
 - 2) Draw neat labeled diagram and give equations wherever necessary
 - 3) Figures to the right indicate full marks.
 - 4) Use of algorithmic table and non-programmable calculator is Allowed.

Q.1 Choose the correct alternatives from the options. 06

- 1) _____ provides color to the building, and it helps to provide balance in the height of the building visually.
 - a) Horticulture
 - b) Landscaping
 - c) Floriculture
 - d) Agriculture
- 2) Landscape architecture is now recognized by international bodies namely _____.
 - a) International Federation of Landscape Architecture (IFLA)
 - b) International Labour Organization
 - c) American Society of Landscape Architecture (ASLA)
 - d) All of the above
- 3) The name landscape architecture was invented by _____ in 1828, France.
 - a) Roxburgh
 - b) Alexopoulos
 - c) Vitrus
 - d) Scotsman
- 4) _____ word derives from the Latin meaning "Creator of places" and is the art of creating sculptures using a medium of living trees and shrubs by pruning and clipping.
 - a) Berm
 - b) Swale
 - c) Topiary
 - d) Trophy
- 5) _____ cut flower is harvested at painting brush stage for local market.
 - a) Tulip
 - b) Marigold
 - c) Rose
 - d) Carnation
- 6) _____ is the national flower of India.
 - a) Lotus
 - b) Marigold
 - c) Rose
 - d) Tulip

- Q.2 Answer the following. (Any Three) 06**
- a) Define Pergolas.
 - b) What is Informal Garden style?
 - c) What is sunken garden?
 - d) Define Hedge.
 - e) Define Annuals with suitable examples.
- Q.3 Answer the following. (Any Two) 06**
- a) Write short note on Rockery/Rock Garden.
 - b) Explain the benefits of CAD (Computer Aided Designing) in Landscaping.
 - c) Describe Landscaping at Public parks.
- Q.4 Answer the following. (Any Two) 06**
- a) What is the importance and scope of floriculture?
 - b) Discuss the role of different elements in making a successful landscape design.
 - c) Define herbaceous perennials. Describe any two herbaceous perennials studied by you.
- Q.5 Answer the following. (Any One) 06**
- a) What is lawn? What are the major advantages of lawn? Explain different methods of planting lawn grasses.
 - b) Discuss different features of gardens in brief.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
ZOOLOGY
Human Nutrition and Health (G04-GE-OE-204)**

Day & Date: Saturday, 04-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options. 06

- 1) _____ is the process of obtaining food and water for the growth, development and maintain health.

a) Nutrition	b) Respiration
c) Reproduction	d) Excretion

- 2) Carbohydrates, Lipids and Proteins are _____.

a) Micronutrients	b) Minerals
c) Macronutrients	d) Vitamin

- 3) _____ are essential minerals needed for building and maintaining strong bones and teeth.

a) Iodine	b) Zinc
c) Iron	d) Calcium and Phosphorus

- 4) A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity is called _____.

a) Mind	b) Health
c) Body	d) Diet

- 5) A medical condition that is caused by regularly drinking a large amount of alcohol and not being able to stop is called _____.

a) Alcoholism	b) Tobacco addiction
c) Narcotism	d) Smoking

- 6) Night blindness is caused due to deficiency of Vit _____.

a) Vit D	b) Vit B
c) Vit A	d) Vit K

Q.2 Answer the following. (Any Three) 06

- a) Define food.
- b) Write names of Fat soluble vitamins.
- c) What is a cause of Goiter?
- d) Give the examples of life style dependent diseases.
- e) Define Yoga.

- Q.3 Answer the following. (Any Two) 06**
- a) Write the basic concept of food.
 - b) Give the symptoms of cholera.
 - c) Explain causes of Diabetes mellitus.
- Q.4 Answer the following (Any Two) 06**
- a) Describe dietary sources and significance of proteins.
 - b) Give an account on Kwashiorkor.
 - c) Explain effects of junk food on health.
- Q.5 Answer the following (Any One) 06**
- a) Describe biological functions of important minerals.
 - b) Give an account on yoga and meditation.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
MATHEMATICS
Logical Reasoning (Verbal) (G04-GE-OE-210)**

Day & Date: Saturday, 04-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options. 06

- 1) Which number would replace question mark in the series
1, 2, 4, 8, ?, 32

a) 10	b) 12
c) 14	d) 16

- 2) Choose the odd pair of words.

a) Time : Second	b) Volume : Litre
c) Resistance : Ohm	d) Pressure : Barometer

- 3) Choose the word which is least like the other word in the following group?

a) Oil	b) Cheese
c) Butter	d) Curd

- 4) Doctor : Nurse :: _____ : Follower

a) Employer	b) Leader
c) Worker	d) Manager

- 5) Complete the series A2, C4, E6, G8, _____.

a) I10	b) I9
c) H8	d) H10

- 6) A leap year has _____ days.

a) 364	b) 365
c) 366	d) 367

Q.2 Answer the following. (Any Three) 06

- a) Find the missing value.
 - i) $2 : 4 :: 6 : 36 :: 9 : \underline{\hspace{2cm}}$
 - ii) $2 : 8 :: 3 : 27 :: 5 : \underline{\hspace{2cm}}$

- b) Choose the numeral pair group which is different from the other.

i) (a) 20 – 5	(b) 16 – 2	(c) 36 – 6	(d) 32 – 5
ii) (a) 30 – 20	(b) 21 – 14	(c) 25 – 8	(d) 15 – 10

- c) A and B are brothers, C and D are sister. A's son is D's brother. How is B related to C?
- d) A and B are married couple, X and Y are brother, X is the brother of A. How is Y related to B?
- e) If PAINT is coded as 74128 and EXCEL is coded as 93596 then how would you encode ACCEPT?

Q.3 Answer the following. (Any Two)

06

- a) Arrange the following in a meaningful sequence.
 - i) a) Locality b) Family c) Country
 - d) Community e) Member
 - ii) a) Birth b) Death c) Funeral
 - d) Marriage e) Education
- b) Choose the odd pair of words & explain.
 - i) a) Painter : Gallery b) Actor : Stage c) Mason : Wall
 - d) Farmer : Field e) Worker : Factory
 - ii) a) Blacksmith : Anvil b) Carpenter : Saw
 - c) Barber : Scissor d) Sculptor : Chisel
 - e) Goldsmith : Ornaments
- c) If it was Saturday on 17th December 1982. What will be the day on 22nd December 1984?

Q.4 Answer the following (Any Two)

06

- a) Find the correct combination in each case
 - i) I : Square :: Arc : II
 - when I (A) Line (B) Diagonal (C) Rectangle (D) Perimeter
 - II (P) Chord (Q) Circle (R) Diameter (S) Circumference
 - ii) I : Water :: Thermometer : II
 - when I (A) Humidity (B) Rain (C) Pitcher (D) Evaporation
 - II (P) Temperature (Q) Mercury (R) Doctor (S) Fever
- b) What should come in the place of question marks (?) in the following alpha numeric series?
 - i) A1, C2, E6, G24, ?
 - ii) F36, E25, D16, C9, ?
- c) Deepa moved a distance of 75 meters towards the north she then turn to the left and walking for about 25 meters turned left again and walked 80 meters. Finally, she turned to the right at an angle of 45°. In which direction was she moving finally?

Q.5 Attempt any one of the following.

- a) In each of the question below is given a statement followed by two assumption number I and II. Consider the statement and decide which of the given assumption is implicit or not.
- 1) Statement: "You must learn to refer to dictionary if you want to become a good writer"- A advises B
 Assumption: I) Only writers refer to the dictionary
 II) All writers good or bad refer to the dictionary
- 2) Statement: The Chairman and Secretary of the housing society have requested society member so use water economically to help society to same on water tax.
 Assumption I) Majority of members of society are likely to follow the request.
 II) It is desirable to reduce expenditure wherever possible.

- b) Study the following information carefully and answer the question that follows:

Madhu and Shobha are good in Dramatics & Computer Science.

Anjail & Madhu are good in Computer Science & Physics.

Anjali, Poonam and Nisha are good in Physics & History.

Nisha & Anjail are good in Physics and Mathematics.

Poonam & Shobha are good in History & Dramatics.

Then answer the following questions.

- i) Who is good in Computer Science, History & Dramatics?
- ii) Who is good in Physics, Dramatics & Computer Science?
- iii) Who is good in Physics, History & Dramatics?
- iv) Who is good in History, Physics, Computer Science & Mathematics?

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
STATISTICS
Sample Survey Techniques (G04-GE-OE-211)**

Day & Date: Saturday, 04-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options. 06

- 1) Simple random sample can be drawn with the help of _____.
 a) random number tables b) lottery method
 c) drawing chits d) All the above
- 2) The discrepancy between estimate and population parameter is known as _____.
 a) Human error b) Sampling error
 c) Non-sampling error d) None of these
- 3) Stratified random sampling belongs to the category of _____.
 a) judgement sampling b) subjective sampling
 c) controlled sampling d) probability sampling
- 4) The number of all possible samples of size 2 from population of 4 units are without replacement are _____.
 a) 6 b) 16
 c) 8 d) 1
- 5) In presence of linear trend _____ method is more efficient.
 a) Stratified b) Systematic
 c) SRSWR d) SRSWOR
- 6) The number of possible samples of size n out of N population units with replacement is _____.
 a) $\binom{N}{n}$ b) N^n
 c) n^2 d) $n!$

Q.2 Answer the following. (Any Three) 06

- a) Define sampling unit and give its example.
- b) Explain demographic surveys.
- c) Define the term statistic.
- d) Describe Educational surveys.
- e) Explain random sample or probability sample.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain simple random sampling with replacement.
 - b) Explain personal interview method and mail enquiry method for data collection.
 - c) Explain procedure of stratified sampling.
- Q.4 Answer the following. (Any Two) 06**
- a) Define concept of non-sampling errors.
 - b) Explain real life situations where systematic sampling is appropriate.
 - c) Differentiate between simple random sampling with replacement and without replacement.
- Q.5 Answer the following. (Any One) 06**
- a) Describe simple random sampling without replacement (SRSWOR). Obtain an unbiased estimator for population mean in case of SRSWOR.
 - b) Explain types of sample surveys.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
Computer Science
Introduction to Internet and Web Design (G04-GE-OE-208)**

Day & Date: Saturday, 04-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives. (MCQ) 06

- 1) Which property is used to change the background color in CSS?
 - a) bgcolor:
 - b) background-color:
 - c) color:
 - d) None of these
- 2) All HTML tags are enclosed in _____.
 - a) # and #
 - b) ? and ?
 - c) < and >
 - d) { and }
- 3) Class attribute is followed by _____ sign.
 - a) @
 - b) &
 - c) #
 - d) .
- 4) Who making the web standards?
 - a) WWW
 - b) Microsoft
 - c) Internet explorer
 - d) None of these
- 5) The default character encoding in HTML5 is _____.
 - a) UTF-16
 - b) UTF-32
 - c) UTF-8
 - d) ISO-8859-1
- 6) A Web site's main page is called _____.
 - a) Bookmark
 - b) Home page
 - c) Browser page
 - d) None of these

Q.2 Answer the following. (Any Three) 06

- a) What is internet?
- b) Explain
 tag.
- c) What is hyperlink?
- d) What is navigation bar?

Q.3 Answer the following. (Any Two) 06

- a) Explain table tag with example in HTML.
- b) Explain Box model with example.
- c) Explain Multimedia tags with example.

- Q.4 Answer the following. (Any Two) 06**
- a) What is selector and explain its types.
 - b) Explain history of internet.
 - c) Explain Frameset tag with example.

- Q.5 Answer the following. (Any One) 06**
- a) Explain different types of CSS.
 - b) Explain form tag and use different input types with example.

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Set **P**

**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026**

ELECTRONICS

Basic Study of Domestic Electronic Appliances (G04-GE-OE-205)

Day & Date: Saturday, 04-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options. 06

- 1) The frequency of domestic AC supply in India is _____.
 - a) 60 Hz
 - b) 50 Hz
 - c) 25 Hz
 - d) 100 Hz

- 2) _____ principle is used in a microwave oven.
 - a) Infrared heating
 - b) Vibration of water molecules
 - c) Electromagnetic induction
 - d) Centrifugation

- 3) LED TV works with the help of _____ principle.
 - a) Cathode Ray Tube
 - b) LCD with LED backlight
 - c) Plasma discharge
 - d) Fibre optics

- 4) The function of a mixer/grinder is based on _____.
 - a) Eddy currents
 - b) High-speed motor with blades
 - c) Magnetic levitation
 - d) Heating coil

- 5) TV remote control uses _____.
 - a) Bluetooth
 - b) Wi-Fi
 - c) Infrared rays
 - d) X-rays

- 6) The working principle of a refrigerator is _____.
 - a) Vapour compression cycle
 - b) Centrifugation
 - c) Conduction
 - d) Magnetism

Q.2 Answer the following. (Any Three) 06

- a) Explain AC and DC with examples.
- b) State the working principle of LED bulb.
- c) Describe the construction and use of a water filter.
- d) Explain the working principle of a washing machine.
- e) Describe power, time period, and frequency of a sine wave.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the working principle of a microwave oven.
 - b) Write a short note on LED TV.
 - c) Explain the functioning of a refrigerator.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain the working principle of a mixer/grinder.
 - b) Explain how a TV remote control works.
 - c) Describe the process of domestic AC supply (230 V, 50Hz).
- Q.5 Answer the following. (Any One) 06**
- a) Explain AC fundamentals with neat diagram.
 - b) Describe the working principle of LED tube light.

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Set	P
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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
MICROBIOLOGY
Food and Dairy Microbiology (G04-GE-OE-206)**

Day & Date: Saturday, 04-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives. 06

- 1) _____ foods spoil more easily.

a) Perishable	b) Semi- perishable
c) Non-perishable	d) Spicy

- 2) Which of the following is the cause of spoilage?
 - a) Growth and activity of micro-organisms
 - b) Action of enzymes
 - c) Chemical reactions
 - d) All of the above

- 3) Conversion of carbohydrate or sugar into acids, alcohols and carbon dioxide is called as _____.

a) Putrefaction	b) Rancidity
c) Rotting	d) Fermentation

- 4) Which of the following is an example of fermented food?

a) Curd	b) Milk
c) Meat	d) Potato

- 5) Which of the following is the principle of food preservation methods?

a) Removal of contamination	b) Inhibition of microbial growth
c) Killing of microorganism	d) All of the above

- 6) _____ Sugar is present in milk.

a) Casein	b) Lactose
c) Mannitol	d) Sucrose

Q.2 Answer the following. (Any Three) 06

- a) What is Asepsis?
- b) Write a short note on types of foods.
- c) Rancidity
- d) Bacterial soft rot
- e) What is Ropiness?

- Q.3 Answer the following. (Any Two) 06**
- a) Write a short note on fermented milk products.
 - b) Discuss opportunities in food industry.
 - c) Spoilage of food
- Q.4 Answer the following. (Any Two) 06**
- a) Write a note on pasteurization.
 - b) Define Fermentation. Mention micro-organisms involved.
 - c) Enlist general changes related to milk spoilage.
- Q.5 Answer the following. (Any One) 06**
- a) Discuss health benefits of fermented foods.
 - b) Write an essay on methods of food preservation.

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Set **P**

**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
GEOGRAPHY
Geography of Maharashtra - II (G04-GE-OE-207)**

Day & Date: Saturday, 04-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.**06**

- 1) According to the 2011 census, Maharashtra's sex ratio was _____.
a) 929 b) 830
c) 850 d) 900
- 2) Maharashtra is the _____ largest state in India in terms of population.
a) First b) Second
c) Third d) Fourth
- 3) _____ district was the lowest population density in Maharashtra in 2011.
a) Chandrapur b) Gadchiroli
c) Bhandara d) Gondia
- 4) Number of females per 1000 male population is known as _____ ratio.
a) Sex b) Migration
c) Population Composition d) Literacy
- 5) The movement of people across international borders known as _____ migration.
a) National b) International
c) Rural-Urban d) Internal
- 6) According to 2011 census literacy rate of Maharashtra is _____.
a) 82.34% b) 85%
c) 75.35% d) 68.23%

Q.2 Answer the following. (Any Three)**06**

- a) Define the literacy rate.
- b) Define the concept of age Composition.
- c) State the influenced factors on growth of population.
- d) Describe the high-density population region in Maharashtra.
- e) Explain the concept of out migration.

- Q.3 Answer the following. (Any Two) 06**
- a) Describe the effect of migration.
 - b) Explain the characteristics of rural-urban Population.
 - c) Define the remedies of population Growth.
- Q.4 Answer the following (Any Two) 06**
- a) Describe the concept of Sex Ratio.
 - b) Define the concept of growth of population in Maharashtra.
 - c) Define the problems of poverty.
- Q.5 Answer the following (Any One) 06**
- a) Describe the affecting factors on distribution of population in Maharashtra.
 - b) Define the concept of migration and describe the types of migration.

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Set P

**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
GEOLOGY
Environmental Geology (G04-GE-OE-209)**

Day & Date: Saturday, 04-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options.

06

- 1) Dimensions of environment include _____.
 - a) Time
 - b) Space
 - c) Time & Space
 - d) 3D
- 2) Surroundings of an individual is _____.
 - a) Climate
 - b) Atmosphere
 - c) Environment
 - d) Ecology
- 3) Component of Hydrosphere is _____.
 - a) Water
 - b) Gases
 - c) Liquid
 - d) Grass
- 4) Components of biosphere are _____.
 - a) Animals
 - b) Plants
 - c) Reptiles
 - d) Organisms
- 5) Major past climatic event on earth is _____.
 - a) Ice Age
 - b) Glacier
 - c) Snowfall
 - d) Precipitation
- 6) Black cotton soil in Maharashtra is sourced from _____ rock.
 - a) Granite
 - b) Laterite
 - c) Sandstone
 - d) Basalt

Q.2 Answer the following (Any three)

06

- a) What is negative ecological Interaction?
- b) What was condition of earth in past glacial period?
- c) What can be the natural source of pollution of water?
- d) In which month the monsoon normally reaches the Indian Coast?
- e) Define the earthquake.

- Q.3 Answer the following. (Any two) 06**
- a) Write any three causes of soil pollution.
 - b) What are anthropogenic sources of air pollution?
 - c) What are preparedness for volcanic hazard?
- Q.4 Answer the following. (Any two) 06**
- a) Describe solutions for flood hazard.
 - b) Describe role of time & intensity of rainfall is Flood hazard.
 - c) What is landslide? Write any two causes of landslide.
- Q.5 Attempt the following (Any One) 06**
- a) Describe the dimensions of the environment with examples.
 - b) Describe air pollution in detail. Add note on solutions.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
Environmental Science
Divisions of the Environment (G04-GE-OE-212)**

Day & Date: Saturday, 04-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives. (MCQ) 06

- 1) The uppermost layer of atmosphere is known as _____.
a) Ionosphere b) Troposphere
c) Stratosphere d) Exosphere

- 2) Sandstone is an example of which of the following rock _____.
a) Metamorphic rock b) Sedimentary rock
c) Igneous rock d) None of the above

- 3) The outermost solid part of the Earth is known as _____.
a) Core b) Mantle
c) Crust d) None of the options

- 4) Which power is generated using water?
a) Solar power b) Thermal power
c) Biofuel d) Hydroelectric power

- 5) Which soil horizon is primarily composed of organic matter and decaying plant material?
a) B horizon b) C horizon
c) O horizon d) E horizon

- 6) Which land biome is extremely cold and dry?
a) Desert b) Tundra
c) Grassland d) Mountains

Q.2 Answer the following. (Any Three) 06

- a) Define stratosphere.
- b) Write note on Igneous rock.
- c) Write note on deciduous Forest.
- d) Write importance of Ice Caps.
- e) Define Biodiversity.

- Q.3 Answer the following. (Any Two) 06**
- a) Write importance of Hydrosphere.
 - b) Write characteristics of Desert.
 - c) Difference between Weather and Climate.
- Q.4 Answer the following. (Any Two) 06**
- a) Write physical properties of Soil.
 - b) Which are the major climatic zones of the world?
 - c) Write note on soil formation.
- Q.5 Answer the following. (Any One) 06**
- a) Explain internal structure of earth with diagram.
 - b) Write note on Hydrologic cycle with diagram.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
English / English for Communication - II (ENG-201)**

Day & Date: Monday, 06-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate marks.

Q.1 Choose the correct alternative from the options. 06

- 1) What is the main difference between listening and hearing?
 - a) Listening is active hearing is passive.
 - b) Hearing is better than listening.
 - c) Listening does not need attention.
 - d) Hearing requires interpretation.

- 2) Which tone is used in yes/no questions?

a) Rising	b) Falling
c) Neutral	d) Flat

- 3) Why is tone important in speech?

a) It conveys emotions.	b) It changes grammar.
c) It makes speech longer.	d) It removes meaning.

- 4) Which of the following is NOT essential for effective writing?

a) Clarity	b) Proper structure
c) Unnecessary repetition	d) Concise language

- 5) What should be avoided in a formal letter?
 - a) Professional tone
 - b) Clear purpose
 - c) Slang and informal language
 - d) Proper salutations

- 6) What is the first element of a newspaper report?

a) Conclusion	b) Headline
c) Supporting detailed	d) Salutations

Q.2 Answer the following. (Any Two) 06

- a) Why is listening important in communication?
- b) What are the effective ways to improve listening skills?
- c) What is mean by blog?
- d) What is formal letter?

Q.3 Write Short Notes. (Any One)

06

a) Define listening and explain the five stages of the listening process.

OR

b) What are the effective ways to improve listening skills?

Q.4 Broad Question. (Any One)

12

a) Explain in brief the types of emails.

OR

b) What is a type of formal letter?

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Set P

B.Sc. (Plain) (सत्र - II) (नवीन) (NEP CBCS) परीक्षा: मार्च/एप्रिल – २०२६
Environmental Studies (ENS-24)

वार, दिनांक : मंगळवार, ०७-०४-२०२६
वेळ: दुपारी ०३:०० ते ०४:३०

कमाल गुण: ३०

- सूचना :** १) सर्व प्रश्न अनिवार्य आहेत.
२) उजवीकडील अंक पूर्ण गुण दर्शवितात.
३) जिथे आवश्यक असेल तिथे सुबक आकृत्या आणि समीकरणे काढा.

प्र.१ खालील दिलेले योग्य पर्याय निवडून गाळलेल्या जागा भरा.

०६

- १) ध्वनी कोणत्या एककात मोजतात?
अ) किलोमीटर ब) पास्कल
क) किलोग्राम ड) डेसिबल
- २) 'सायलेंट व्हॅली' हे राष्ट्रीय उद्यान भारतातील ——— येथे आहे.
अ) केरळ ब) महाराष्ट्र
क) ओडिशा ड) गुजरात
- ३) पृथ्वीवरील सर्वात मोठी परिसंस्था कोणती आहे?
अ) वाळवंट ब) जंगल
क) गवताळ प्रदेश ड) महासागर
- ४) ——— म्हणजे पाण्याचा तात्पुरता अतिप्रवाह जो जमिनीला पाण्याखाली बुडवतो, ज्यामुळे सजीव आणि निर्जीव वस्तूवर लहान किंवा मोठा विनाशकारी परिणाम होऊ शकतो.
अ) भूकंप ब) ज्वालामुखी
क) पूर ड) मृदा धूप
- ५) CNG चा पूर्ण अर्थ काय आहे?
अ) कॉम्प्रेस्ड नॅचरल गॅस (दाबलेला नैसर्गिक वायू)
ब) कोरोसिव्ह नॅचरल गॅस (संक्षारक नैसर्गिक वायू)
क) केमिकल न्यूट्रल गॅस (रासायनिक उदासीन वायू)
ड) चीप नॅचरल गॅस (स्वस्त नैसर्गिक वायू)

६) बिश्रोई, जे शेकडो वर्षापासून पश्चिम ——— मध्ये राहतात, वनस्पती आणि प्राण्यांचे संरक्षण करतात, यासाठी त्यांनी पर्यावरणाचे रक्षण करण्यासाठी आपल्या प्राणांचे बलिदानही दिले आहे.

अ) राजस्थान

ब) कर्नाटक

क) हिमालय

ड) महाराष्ट्र

प्र.२ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही दोन)

०६

अ) परिसंस्थेबद्दल लिहा.

ब) मृदा क्षरणाची (soil erosion) कोणतीही दोन कारणे लिहा.

क) जैवविविधता (biodiversity) या शब्दाची व्याख्या लिहा.

ड) अक्षय ऊर्जा स्रोत (renewable energy sources) म्हणजे काय?

प्र.३ थोडक्यात टिपा लिहा.

०६

जागतिक तापमान वाढ (global warming) म्हणजे काय? त्याचे परिणाम लिहा.

प्र.४ खालील प्रश्नांची उत्तरे लिहा. (कोणताही एक)

१२

अ) जैवविविधतेचे 'इन-सिटू' (In-situ) आणि 'एक्स-सिटू' (Ex-situ) संवर्धन याबद्दल सविस्तर वर्णन करा.

ब) जलप्रदूषणाची (water pollution) कारणे आणि त्यावर नियंत्रण कसे मिळवावे हे स्पष्ट करा.

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Set **P**

**B.Sc. (Plain) (Semester-II) (New) (NEP CBCS) Examination:
March/April – 2026
Environmental Studies (ENS-24)**

Day & Date: Tuesday, 07-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams and equations wherever necessary.

Q.1 Choose the correct alternatives from the options. 06

- 1) In which unit sound is measured?

a) Kilometer	b) Pascal
c) Kilogram	d) Decibel

- 2) Silent Valley is a national park located _____ in India.

a) Kerala	b) Maharashtra
c) Odisha	d) Gujarat

- 3) Which is the largest ecosystem on Earth?

a) Desert	b) Forest
c) Grassland	d) Oceans

- 4) _____ temporary overflow of water that submerges land, which may have small or large destructive impact on living and non living things.

a) Earthquake	b) Volcano
c) Flood	d) Soil erosion

- 5) CNG stands for?

a) Compressed Natural Gas	b) Corrosive Natural Gas
c) Chemical Neutral Gas	d) Cheap Natural Gas

- 6) The Bishnois, living in western _____ for centuries, have been conserving the flora and fauna to the extent of sacrificing their lives to protect the environment.

a) Rajasthan	b) Karnataka
c) Himalaya	d) Maharashtra

Q.2 Answer the following questions. (Any Two) 06

- a) Write about ecosystem.
- b) Write any two causes of soil erosion.
- c) Define the term biodiversity.
- d) What are renewable energy sources?

- Q.3 Write short note.** **06**
What is mean of global warming? Write its effects.
- Q.4 Answer the following questions. (Any One)** **12**
- a)** Describe in detail about In-situ and Ex-situ conservation of biodiversity.
 - b)** Explain causes and control of water pollution.

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Set P

B.Sc. (Plain) (सत्र - II) (नवीन) (NEP CBCS) परीक्षा: मार्च/एप्रिल - २०२६
Co-Curricular Course
National Service Scheme (CC-201)

वार, दिनांक: बुधवार, ०८-०४-२०२६
वेळ: दुपारी ०३:०० ते ०४:३०

कमाल गुण: ३०

सूचना : १) सर्व प्रश्न अनिवार्य आहेत.
२) उजवीकडील अंक पूर्ण गुण दर्शवितात.

- प्र.१ खालील दिलेले योग्य पर्याय निवडून गाळलेल्या जागा भरा. ०६
- १) "मी माझ्यासाठी नसून इतरांसाठी" हे घोषवाक्य ——— चे आहे.
अ) राष्ट्रीय सेवा योजना ब) रोजगार हमी योजना
क) एनजीओ ड) स्वयं बचत गट
- २) राष्ट्रीय सेवा योजनेच्या एका वर्षात ——— तास काम करणे अपेक्षित असते.
अ) १०० ब) २४०
क) ८० ड) १५०
- ३) विशेष शिबिराचे गाव महाविद्यालयापासून ——— असावे.
अ) जवळ ब) अतिदूर
क) दूर ड) वरील सर्व
- ४) ——— हा दिवस जागतिक लोकसंख्या दिन म्हणून साजरा केला जातो.
अ) २४ सप्टेंबर ब) ११ जुलै
क) १५ ऑगस्ट ड) ०५ जून
- ५) रा.से.यो. चिन्ह चक्र हे ——— रंगाचे आहे.
अ) हिरवा ब) लाल
क) पिवळा ड) निळा
- ६) राष्ट्रीय सेवा योजनेची सुरुवात ——— या वर्षी झाली.
अ) १९७५ ब) १९५०
क) १९६९ ड) १९४७

- प्र.२ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही तीन) 0६
- अ) राष्ट्रीय सेवा योजनेच्या डायरी (नोंदवही) ची देखभाल लिहा.
 ब) जनजागृती रॅलीची गरज का आहे?
 क) प्रथमोपचार कौशल्याची माहिती सांगा.
 ड) रा.से.या.कार्यक्रमाचे वर्गीकरण सांगा.
 इ) रक्तदानाची आवश्यकता का आहे?
- प्र.३ खालील प्रश्नांची थोडक्यात उत्तरे लिहा. (कोणतेही दोन) 0६
- अ) रा.से.यो.चा इतिहास लिहा.
 ब) दत्तक खेड्यामध्ये नियमित उपक्रमावर चर्चा करा.
 क) मतदान जनजागृती आणि नावनोंदणी शिबीर यावर चर्चा करा.
- प्र.४ दीर्घोत्तरी प्रश्नांची उत्तरे लिहा. (कोणताही एक) 0६
- अ) वृक्षारोपण आणि स्वच्छता मोहीम स्पष्ट करा.
 ब) रा.से.यो. चे महत्व स्पष्ट करा.
- प्र.५ दीर्घोत्तरी प्रश्नाचे उत्तर लिहा. 0६
- विशेष शिबिर कार्यक्रमातील नियोजन, पूर्वतयारी, संघटना आणि प्रशासन स्पष्ट करा.

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Set	P
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**B.Sc. (Plain) (Semester-II) (New) (NEP CBCS) Examination:
March/April – 2026
Co-Curricular Course
National Service Scheme (CC-201)**

Day & Date: Wednesday, 08-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative.

06

- 1) "Not me but you" is a motto of _____.
a) N.S.S.
b) Employment Guarantee Scheme
c) N.G.O.
d) Self-Saving Group
- 2) _____ is the number of hours the N.S.S. volunteers expected to work during the year.
a) 100
b) 240
c) 80
d) 150
- 3) The special camping village should be _____ from college.
a) Near
b) Far away
c) Away
d) All of these
- 4) _____ is celebrated as the World Population Day.
a) 24th September
b) 11th July
c) 15th August
d) 05th June
- 5) The N.S.S. emblem, the chakra bears _____ colour.
a) Green
b) Red
c) Yellow
d) Blue
- 6) The National Service Scheme is started in the year of _____.
a) 1975
b) 1950
c) 1969
d) 1947

Q.2 Write answer of the following questions. (Any Three)

06

- a) Write the maintenance of NSS dairy.
- b) Why need is Awareness of Rallies?
- c) State of First Aid Skill Activity.
- d) State the Classification of NSS Programme.
- e) Why is important of Blood Donation?

- Q.3 Write Short answers to questions. (Any Two) 06**
- a) Write the History of NSS.
 - b) Discuss the Regular activities in Adopted Village.
 - c) Discuss the Voter Awareness and Registration Camp.
- Q.4 Write answers to broad questions. (Any One) 06**
- a) Explain the Tree Plantation and Cleanup drive.
- OR**
- b) Explain the Importance of NSS.
- Q.5 Write answers to broad question. 06**
- Explain the Planning, Preparation, Organization and Administration of Special Camping Programme.

Seat No.	
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Set **P**

B.Sc. (Plain) (सत्र - II) (नवीन) (NEP CBCS) परीक्षा: मार्च/एप्रिल - २०२६
Co-Curricular Course
National Cadet Corps (CC-202)

वार, दिनांक: बुधवार, ०८-०४-२०२६
 वेळ: दुपारी ०३:०० ते ०४:००

कमाल गुण: १५

सूचना : १) सर्व प्रश्न अनिवार्य आहेत.
 २) उजवीकडील अंक पूर्ण गुण दर्शवितात.

प्र.१ खालील दिलेल्या योग्य पर्याय निवडून गाळलेल्या जागा भरा. ०४

- १) एखाद्याला ---- मार्फत व्यक्त करता येते.
 अ) तोंडी ब) हावभाव
 क) लेखी ड) यापैकी सर्व
- २) काही गुण बदलता येत नाहीत.
 अ) नविन ब) दत्तक
 क) जन्मजात ड) नैसर्गिक
- ३) स्वतःला खूप वेगळे समजणे म्हणजे ----.
 अ) अतिअहंकारी व्यक्तिमत्त्व ब) स्वयंप्रेरित
 क) आनंदी ड) वास्तव
- ४) व्यक्तिमत्त्व ---- नुसार बदलते.
 अ) प्रत्येक व्यक्ती ब) वेळ
 क) काम ड) यापैकी नाही

प्र.२ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही दोन) ०४

- अ) व्यक्तिमत्त्व विकासाचे कोणतेही दोन घटक सांगा.
 ब) प्रामाणिकपणाची दोन उदाहरणे सांगा.
 क) व्यक्तिमत्त्व विकासाचे दोन प्रकार सांगा.
 ड) 'समर्थन आणि आदर' ची उदाहरणे सांगा.

प्र.३ चारित्र्य कसे सुधारावे? यावर टिप लिहा. ०३

प्र.४ उत्तम नेतृत्वासाठी महत्वाची मूल्ये स्पष्ट करा. ०४

किंवा

व्यक्तिमत्त्व विकासामध्ये एन.सी.सी. छात्रांची भूमिका स्पष्ट करा.

Seat No.	
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Set **P**

**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April – 2026
Co-Curricular Course
National Cadet Corps (CC-202)**

Day & Date: Wednesday, 08-04-2026
Time: 03:00 PM To 04:00 PM

Max. Marks: 15

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative from the options. 04

- 1) One can express thought _____.

a) oral	b) gestures
c) written	d) all of the above
- 2) Few _____ traits can not changed.

a) New	b) adopted
c) inborn	d) natural
- 3) Thinking oneself very different is _____.

a) superego	b) self motivation
c) pleasure	d) reality
- 4) The personality vary as per _____.

a) individuals	b) time
c) work	d) none of these

Q.2 Attempt the following questions. (Any Two) 04

- a) State any two factors for personality development.
- b) Give examples of honesty.
- c) Mention any two types of personality development.
- d) Give examples of support and respect.

Q.3 Write a note on “How to improve character”? 03

Q.4 Explain importance values for a good leader. 04

OR

Explain role of NCC cadet in personality development.

Seat No.	
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Set **P**

B.Sc. (Plain) (सत्र - II) (नवीन) (NEP CBCS) परीक्षा: मार्च/एप्रिल - २०२६
Co-Curricular Course
Sports (CC-203)

वार, दिनांक : बुधवार, ०८-०४-२०२६

कमाल गुण: १५

वेळ: दुपारी ०३:०० ते ०४:००

सूचना : १) सर्व प्रश्न अनिवार्य आहेत.
 २) उजवीकडील अंक पूर्ण गुण दर्शवितात.

- प्र.१ खालील दिलेल्या योग्य पर्याय निवडून गाळलेल्या जागा भरा. ०४
- १) खो खो खेळात एकूण ——— खेळाडू असतात.
 अ) १० ब) ९
 क) १२ ड) ११
- २) खेळ हा ——— प्रकाराचा उपक्रम आहे.
 अ) मानसिक ब) शारीरिक
 क) सामाजिक ड) वरील सर्व
- ३) नीरज चोप्रा ——— हा खेळातील प्रसिद्ध खेळाडू आहे.
 अ) गोळाफेक ब) भालाफेक
 क) क्रिकेट ड) लांब उडी
- ४) क्रिकेट, बेसबॉल आणि हॅन्डबॉल हे ——— प्रकारचे खेळ आहे.
 अ) वैयक्तिक ब) सांघिक
 क) मनोरंजक ड) अन्य
- प्र.२ टिपा लिहा. ०६
- अ) खेळाचे शारीरिक फायदे
 ब) खेळाची संकल्पना
 क) खेळाची मानसिक फायदे
- प्र.३ दीर्घोत्तरी प्रश्न. (कोणताही एक) ०५
- अ) खेळाचा इतिहास सांगा.
 ब) खेळाचे विविध प्रकार स्पष्ट करा.

Seat No.	
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Set P

**B.Sc. (Plain) (Semester-II) (New) (NEP CBCS) Examination:
March/April – 2026
Co-Curricular Course
Sports (CC-203)**

Day & Date: Wednesday, 08-04-2026
Time: 03:00 PM To 04:00 PM

Max. Marks: 15

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct Alternative and fill in the blanks **04**

- 1) The total number of players in the game of Kho-Kho is _____.
a) 10 b) 9
c) 12 d) 11

- 2) Sports is a _____ type of activity.
a) Mental b) Physical
c) Social d) All of the above

- 3) Neeraj Chopra is a famous player in _____.
a) Shot put b) Javelin throw
c) Cricket d) Long jump

- 4) Cricket, baseball, and handball are _____ type of games.
a) Individual b) Team
c) Recreational d) Other

Q.2 Write short notes. **06**

- a) Physical benefits of sports
- b) Concept of sports
- c) Mental benefits of sports

Q.3 Board question answer. (Any One) **05**

- a) Explain the history of sports.
- b) Explain the different types of sports.

Seat No.	
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Set P

B.Sc. (Plain) (सत्र - II) (नवीन) (NEP CBCS) परीक्षा: मार्च/एप्रिल - २०२६
Co-Curricular Course
Culture (CC-204)

वार, दिनांक: बुधवार, ०८-०४-२०२६
वेळ: दुपारी ०३:०० ते ०४:३०

कमाल गुण: ३०

- सूचना : १) सर्व प्रश्न अनिवार्य आहेत.
२) उजवीकडील अंक पूर्ण गुण दर्शवितात.

- प्र.१ खालील दिलेले योग्य पर्याय निवडून गाळलेल्या जागा भरा. ०६
- १) कायिक अभिनय, ज्याला ——— अभिनय असेही म्हणतात.
अ) आहार्य ब) सात्विक
क) वाचिक ड) आंगिक
 - २) ——— अभिनय म्हणजे आवाज आणि शब्दांच्या माध्यमातून पात्राची भूमिका साकारणे.
अ) आहार्य ब) सात्विक
क) वाचिक ड) आंगिक
 - ३) मुकनाट्य म्हणजे असा नाट्यप्रयोग ज्यामध्ये कोणताही ——— नसतो.
अ) ध्वनि ब) संवाद
क) अभिनय ड) विषय
 - ४) रस्त्यावर सादर केल्या जाणाऱ्या कला प्रकाराला ——— म्हणतात.
अ) पथनाट्य ब) वगनाट्य
क) एकांकिका ड) लघुनाटिका
 - ५) एकांकिका नाट्यप्रकारात ——— अंक असतात.
अ) एक ब) अनेक
क) दोन ड) तीन
 - ६) ——— म्हणजे लिखित मजकूर अर्थपूर्ण आणि प्रभावीपणे वाचणे.
अ) एकांकिका ब) अभिवाचन
क) लघुनाटिका ड) पथनाट्य

- प्र.२ खालील प्रश्नांची थोडक्यात उत्तरे लिहा. (कोणतेही दोन) 0६
- अ) मुकनाट्याचा थोडक्यात परिचय द्या.
ब) साहित्यकलेच्या सादरीकरणाचे प्रकार लिहा.
क) कथाकथन कसे करावे? स्पष्ट करा.
ड) वकृत्व करतांना कोणती तयारी करावी?
- प्र.३ टिप्पणी लिहा. 0६
काव्यवाचन
- प्र.४ खालील प्रश्नाचे तपशीलवार उत्तर लिहा. (कोणताही एक) १२
- अ) अभिनयाची संकल्पना स्पष्ट करा.
किंवा
ब) साहित्यकलेचे स्वरूप स्पष्ट करा.

Seat No.	
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Set	P
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**B.Sc. (Plain) (Semester-II) (New) (NEP CBCS) Examination:
March/April – 2026
Co-Curricular Course
Culture (CC-204)**

Day & Date: Wednesday, 08-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative. 06

- 1) Physical acting, also known as _____ acting.
 - a) Aaharya
 - b) Sattvic
 - c) Vachik
 - d) Angik
- 2) _____ Acting is the portrayal of a character through voice and words.
 - a) Aaharya
 - b) Sattvic
 - c) Vachik
 - d) Angik
- 3) Mime is a theatrical performance in which there is no _____.
 - a) Sound
 - b) Dialogue
 - c) Acting
 - d) Subject
- 4) The art form performed on the street is called _____.
 - a) Street play
 - b) Vagnatya
 - c) One-act play
 - d) Short play
- 5) One-act drama has _____ numbers.
 - a) One
 - b) Many
 - c) Two
 - d) Three
- 6) _____ means reading a written text meaningfully and effectively.
 - a) One-act play
 - b) Recitation
 - c) Short play
 - d) Street play

Q.2 Write a short answer. (Any Two) 06

- a) Give a brief introduction to Mime.
- b) Write the types of presentation of literary art.
- c) How to do storytelling? Explain.
- d) What preparation should be done while giving a speech?

Q.3 Write short note. 06

Poetry Reading

Q.4 Write a detail answer. (Any One)

12

a) Explain the concept of acting.

OR

b) Explain the nature of literary art.

Seat No.	
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Set P

B.Sc. (Plain) (सत्र - II) (नवीन) (NEP CBCS) परीक्षा: मार्च/एप्रिल – २०२६
Co-Curricular Course
Health, Wellness and Fitness (CC-205)

वार, दिनांक: बुधवार, ०८-०४-२०२६
वेळ: दुपारी ०३:०० ते ०४:००

कमाल गुण: १५

सूचना : १) सर्व प्रश्न अनिवार्य आहेत.
२) उजवीकडील अंक पूर्ण गुण दर्शवितात.

प्र.१ योग्य पर्याय लिहा. ०४

- १) एन. आय. एच. ही संस्था ——— संबंधित कार्य करते.
अ) आरोग्य ब) खेळ
क) व्यवसाय ड) यापैकी नाही
- २) ——— हा जीवनसत्त्वाचा प्रकार नाही.
अ) अ ब) ब
क) क ड) टी
- ३) जागतिक आरोग्य संघटनेचे मुख्यालय ——— या ठिकाणी आहे.
अ) दिल्ली ब) रोम
क) जिनेव्हा ड) कतार
- ४) ——— याला वैयक्तिक स्वच्छता म्हणता येईल.
अ) आंघोळ करणे ब) नखे काढणे
क) स्वच्छ कपडे घालणे ड) वरील सर्व

प्र.२ खालील प्रश्नांची थोडक्यात उत्तरे लिहा. (कोणतेही तीन) ०६

- अ) तंदुरुस्ती म्हणजे काय?
- ब) व्यायामाचा स्नायूवर होणारा परिणाम सांगा.
- क) आरोग्याची व्याख्या लिहा.
- ड) समतोल आहार म्हणजे काय?

प्र.३ सविस्तर उत्तरे लिहा. (कोणताही एक) ०५

- अ) वैयक्तिक स्वच्छता मधील घटक लिहा आणि सविस्तर स्पष्ट करा.
- ब) जागतिक आरोग्य संघटनेचे कार्य सविस्तर लिहा.

Seat No.	
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Set	P
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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April – 2026
Co-Curricular Course
Health, Wellness and Fitness (CC-205)**

Day & Date: Wednesday, 08-04-2026
Time: 03:00 PM To 04:00 PM

Max. Marks: 15

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative from the options. 04

- 1) NIH is an organization that works in the field of _____.
 - a) Health
 - b) Sports
 - c) Business
 - d) None of these

- 2) _____ is not type of vitamin.
 - a) A
 - b) B
 - c) C
 - d) T

- 3) The headquarter of the World Health Organization is located in _____.
 - a) Delhi
 - b) Rome
 - c) Geneva
 - d) Qatar

- 4) _____ can be called as personal hygiene.
 - a) Washing hands
 - b) Cutting nails
 - c) Wearing clean clothes
 - d) All of the above

Q.2 Write short answers. (Any Three) 06

- a) What is mean by fitness?
- b) Write the effect of exercises on Muscles.
- c) Write the definition of Health.
- d) What is mean by Balance diet?

Q.3 Answer the following question in detail. (Any One) 05

- a) Write the components of personal hygiene and explain them in detail.
- b) Write the detailed work of the World Health Organization.

Seat No.	
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Set **P**

B.Sc. (Plain) (सत्र - II) (नवीन) (NEP CBCS) परीक्षा: मार्च/एप्रिल – २०२६
Co-Curricular Course
Yoga Edu. / Performing Arts (CC-206)

वार, दिनांक: बुधवार, ०८-०४-२०२६
वेळ: दुपारी ०३:०० ते ०४:००

कमाल गुण: १५

सूचना : १) सर्व प्रश्न अनिवार्य आहेत.
२) उजवीकडील अंक पूर्ण गुण दर्शवितात.

प्र.१ योग्य पर्याय निवडा. ०४

- १) — योग करण्याची योग्य वेळ कोणती?
अ) दुपारचे सत्र
क) संध्याकाळचे सत्र
ब) सकाळी लवकर
ड) रात्रीचे सत्र
- २) — योग शब्दाचा अर्थ काय आहे?
अ) अभ्यास
क) ध्यान
ब) जोडणे व एकत्र आणणे
ड) विश्रांती
- ३) अनुलोम विलोम प्राणायाम करताना श्वास कसा घ्यावा?
अ) एका नाकपुडीने श्वास घेणे आणि दुसऱ्या नाकपुडीतून श्वास सोडणे
ब) दोन्ही नाकपुड्यांमधून श्वास आत घेणे आणि बाहेर सोडणे
क) तोंडाने श्वास घेणे
ड) श्वास रोखून धरणे
- ४) योग दिवस — साजरा केला जातो?
अ) २१ जून
क) २५ जून
ब) २२ जून
ड) २८ जून

प्र.२ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही तीन) ०६

- अ) योगाची कोणतीही तीन उद्दिष्टे लिहा.
ब) आसने कोणत्या प्रकारे केली जाऊ शकतात?
क) मानवी जीवनात योगाची काय गरज आहे?
ड) प्राणायामात श्वास स्वीकारणे, श्वास रोखून ठेवणे आणि श्वास सोडणे या प्रक्रियांची नावे काय आहेत?

प्र.३ सविस्तर उत्तर लिहा. (कोणताही एक)

०५

अ) योगाचे महत्त्व स्पष्ट करा.

किंवा

ब) प्राणायामाचे महत्त्व स्पष्ट करा.

Seat No.	
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Set	P
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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
Co-Curricular Course
Yoga Edu. / Performing Arts (CC-206)**

Day & Date: Wednesday, 08-04-2026
Time: 03:00 PM To 04:00 PM

Max. Marks: 15

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative. 04

- 1) _____ is the right time to do Yoga?
 - a) Afternoon session
 - b) Early morning
 - c) Evening session
 - d) Night session

- 2) _____ is the meaning of Yoga word?
 - a) Exercise
 - b) Join & bring together
 - c) Meditation
 - d) Rest

- 3) How should one breathe while performing Anulom Vilom Pranayama?
 - a) Inhale through one nostril and exhale through the other
 - b) Inhale and exhale through both nostrils
 - c) Breathe through the mouth
 - d) Hold your breath

- 4) _____ is Yoga day celebrated?
 - a) 21 June
 - b) 22 June
 - c) 25 June
 - d) 28 June

Q.2 Write short answer. (Any Three) 06

- a) Write any three objectives of yoga.
- b) In what ways can asanas be performed?
- c) What is the need of yoga in human life?
- d) What are the names of the processes of inhalation, holding the breath and exhalation in pranayama?

Q.3 Write the detail answer. (Broad answer type question) (Any One) 05

- a) Explain the importance of yoga.
- OR**
- b) Explain the importance of pranayama.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April – 2026
PHYSICS – II
Electricity, Magnetism and Basic Electronics (G04-0201)**

Day & Date: Thursday, 09-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw Neat labelled diagrams wherever necessary.
4) Use of log table and calculator is allowed.

Q.1 Choose the correct alternatives. 06

- 1) As the current in a parallel resonant circuit at the resonant frequency is minimum and has almost zero value, such a circuit is known as _____ circuit.

a) acceptor	b) band pass
c) rejector	d) voltage magnification
- 2) Charging of capacitor takes _____ time to reach its maximum value.

a) finite	b) infinite
c) zero	d) medium
- 3) The bridge rectifier consists of _____ diodes

a) 2	b) 3
c) 4	d) 6
- 4) _____ is not a type of transistor configuration.

a) Common Base (CB)	b) Common Emitter (CE)
c) Common Collector (CC)	d) Common Resistance (CR)
- 5) Ballistic galvanometer is used to measure _____.

a) resistance	b) mass
c) reactance	d) charge
- 6) The junction barrier potential difference for a germanium diode is of the order of _____.

a) 1.5 V	b) 0.7V
c) 0.3 V	d) 1 V

- Q.2 Attempt the following. (Any Three) 06**
- a) Define the time constant of the RC circuit.
 - b) Write the relation between α and β for a transistor.
 - c) In a series L-C-R circuit, $L = 50 \mu H$, $C = 100 \mu F$. What is the frequency of the a.c. source so that the circuit resonates?
 - d) What is the function of a clamping circuit?
 - e) Define:
 - i) Voltage sensitivity
 - ii) Current sensitivity of a ballistic galvanometer
- Q.3 Attempt the following. (Any Two) 06**
- a) State and explain Biot and Savart's law.
 - b) Obtain an expression for charging of capacitor through resistor.
 - c) Explain the principle and working of an Owen's bridge.
- Q.4 Attempt the following. (Any Two) 06**
- a) Explain the terms: reactants, susceptance and impedance.
 - b) Explain construction of ballistic galvanometer with neat diagram.
 - c) Derive an expression for the decay of current in a circuit containing an inductance (L) and resistance (R) and source of constant emf (E) in series.
- Q.5 Attempt the following. (Any One) 06**
- a) How does a Zener diode regulate voltage?
 - b) Discuss how a CE transistor configuration works as an amplifier.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
CHEMISTRY - II
Organic and Analytical Chemistry (G04-0202)**

Day & Date: Friday, 10-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternatives.

06

- 1) Double headed arrow is used to show _____.
 - a) resonance structure
 - b) movement of electron
 - c) heat transfer
 - d) inductive effect
- 2) _____ effect involves σ & π electrons.
 - a) Inductive
 - b) Hyperconjugation
 - c) Resonance
 - d) Steric
- 3) _____ is strongest acid.
 - a) CH_3COOH
 - b) ClCH_2COOH
 - c) Cl_2CHCOOH
 - d) Cl_3CCOOH
- 4) The ability of substance to rotate plane of plane polarised light is known as _____.
 - a) chirality
 - b) optical isomerism
 - c) optical activity
 - d) stereoisomerism
- 5) _____ is an ionic compound.
 - a) CCl_4
 - b) NaCl
 - c) Cl_2
 - d) He_2
- 6) Halogen in organic compound is detected by _____ method.
 - a) Carius
 - b) Combustion
 - c) Kjeldahl's
 - d) Dumas

Q.2 Answer the following. (Any Three)

06

- a) Define heterolytic bond cleavage with example.
- b) Define carbocation & carbanion.
- c) Define bond length & bond angle.
- d) Define radius ratio & lattice energy.
- e) Define molecular formula & empirical formula.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain plane of symmetry.
 - b) Explain hybridization in ethene.
 - c) Define viscosity, additive property & dipole moment.
- Q.4 Answer the following. (Any Two) 06**
- a) What is addition reaction? Explain nucleophilic addition reaction with example.
 - b) Explain enantiomers.
 - c) Draw the diagram of Born-Haber cycle.
- Q.5 Answer the following. (Any One) 06**
- a) How will you estimate nitrogen from organic compound by Kjeldahl's method?
 - b) How will you determine surface tension of liquid experimentally?

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April – 2026
MATHEMATICS - II
Geometry and Differential Equation (G04-0210)**

Day & Date: Saturday, 11-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options. **06**

- 1) The Angle between the planes $2x - y + z = 6$ & $x + 2y + 2z = 7$ is _____.
- | | |
|--------------------|--------------------|
| a) $\frac{\pi}{2}$ | b) $\frac{\pi}{4}$ |
| c) $\frac{\pi}{3}$ | d) $\frac{\pi}{5}$ |
- 2) Identify the conic if $\Delta \neq 0, a = b,$ & $h = 0$
- | | |
|-------------|--------------|
| a) Circle | b) Ellipse |
| c) Parabola | d) Hyperbola |
- 3) The I.F. of the equation $\frac{dx}{dy} + Py = Q$ is _____.
- | | |
|---------------------|---------------------|
| a) $e^{\int p dy}$ | b) $e^{\int p dx}$ |
| c) $e^{-\int p dx}$ | d) $e^{-\int p dy}$ |
- 4) $\frac{1}{\int(D)} \cdot e^{ax} v = \underline{\hspace{2cm}}$.
- | | |
|---|---|
| a) $\frac{1}{\int(D-a)} \cdot e^{ax} v$ | b) $e^{ax} \frac{1}{\int(D+a)} \cdot v$ |
| c) $\frac{1}{\int(D-a)} \cdot e^{ax}$ | d) None of these |
- 5) The Number of Arbitrary constants in the equation $Ax + By + Cz + D = 0$ is _____.
- | | |
|------|------|
| a) 1 | b) 2 |
| c) 3 | d) 4 |

- 6) If the Transformation formulae $x = \frac{1}{2}x' + \frac{\sqrt{3}}{2}y'$ & $y = \frac{\sqrt{3}}{2}x' + \frac{1}{2}y'$ then angle θ through which the axes is rotated is _____.
- | | |
|--------------------|--------------------|
| a) $\frac{\pi}{6}$ | b) 0 |
| c) $\frac{\pi}{4}$ | d) $\frac{\pi}{3}$ |

Q.2 Answer the following. (Any Three) 06

- a) Solve $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = 0$
- b) Find the direction cosines of the line joining the points $(1,2,3), (-1, -2, -3)$.
- c) Identify the conic given by equation $x^2 + xy + y^2 = 0$
- d) Solve $\frac{1}{D^3 - D^2}x$
- e) Transform the equation $4x^2 - 2\sqrt{3}xy + 2y^2 = 1$ when axes are rotated through an angle 60° .

Q.3 Answer the following. (Any Two) 06

- a) Solve $\frac{d^3y}{dx^3} + y = \sin ax$
- b) Find the equation of Plane through the points $(1,1,0), (-2,2, -1), (1,2,1)$.
- c) Show that $(D - \alpha)(D - \beta)y = (D - \beta)(D - \alpha)y$ where $D = \frac{d}{dx}$

Q.4 Answer the following. (Any Two) 06

- a) If by rotation of axes, the expression $\alpha x + \beta y$ changes to $\alpha'x + \beta'y$ then $\alpha^2 + \beta^2 = \alpha'^2 + \beta'^2$
- b) Solve $(D^3 + 3D^2 + 3D + 1)y = e^{-x} + e^{2x}$
- c) Derive the equation of Plane in Intercept form.

Q.5 Answer the following. (Any One) 06

- a)
 - i) Show that the length of perpendicular from point $p(x_1, y_1, z_1)$ to a plane $Ax + By + Cz + D = 0$ is $\frac{Ax_1 + By_1 + Cz_1 + D}{\sqrt{A^2 + B^2 + C^2}}$
 - ii) Find the equation of plane through the point $(1, -3, 2)$ & perpendicular to the plane $x + 2y + 2z = 5$ & $3x + 3y + 2z = 8$
- b) Define Linear Differential Equation & Explain the method of solving it.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April – 2026
MICROBIOLOGY – II
Applied Microbiology (G04-0206)**

Day & Date: Saturday, 11-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat labelled diagrams wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives. (MCQ) 06

- 1) Sneezing and coughing spreads microorganisms through _____.
a) Droplet nuclei b) Water
c) Soil d) Food
- 2) In SPC the colonies count is measured in _____ unit.
a) CFU/100ml b) CFU/ml
c) PFU/ml d) PFU/100ml
- 3) _____ is a typical coliform.
a) *Enterobacter aerogenes* b) *Escherichia coli*
c) *Salmonella* d) *Shigella*
- 4) Phosphatase test is used to check the efficiency of _____.
a) Sterilization b) Radiation
c) Pasteurization d) Sanitation
- 5) When the disease occurs in very large population throughout the world is _____.
a) epidemic b) sporadic
c) endemic d) pandemic
- 6) _____ is waterborne disease.
a) Typhoid b) Rabies
c) Tuberculosis d) AIDS

Q.2 Answer the following. (Any Three) 06

- a) Define Aerosol.
- b) Enlist sources of Contamination of Water.
- c) Define Pathogenicity.
- d) Define COD.
- e) Enlist the types of sewage.

- Q.3 Answer the following. (Any Two) 06**
- a) Write a note on MBRT.
 - b) Explain in short indicators of Fecal pollution of water.
 - c) Mixed and reinfection
- Q.4 Answer the following. (Any Two) 06**
- a) Write in short composition of milk.
 - b) Write a note on primary sewage treatment.
 - c) Describe Liquid impingement Method.
- Q.5 Answer the following. (Any One) 06**
- a) Describe in detail the Routine Bacteriological analysis of water.
 - b) Explain in detail mode of transmission of disease.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
STATISTICS - II
Elementary Statistics (G04-0211)**

Day & Date: Monday, 13-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of Calculator is allowed.

Q.1 Choose the correct alternative.

06

- 1) The complementary event of an impossible event is _____.
 a) Impossible event b) Sure event
 c) Random event d) None of these

- 2) The probability of getting 5 Sundays in the month of May is _____.
 a) $\frac{2}{7}$ b) $\frac{3}{7}$
 c) $\frac{1}{7}$ d) $\frac{6}{7}$

- 3) In A_1, A_2, A_3 are mutually independent, then they are _____.
 a) mutually exclusive
 b) pairwise independent
 c) partition of the sample space
 d) None of these

- 4) If A and B are independent events with $P(A) = \frac{1}{2}, P(B) = \frac{1}{3}$, then $P(A \cap B) =$ _____.
 a) $\frac{2}{3}$ b) 1
 c) $\frac{1}{6}$ d) None of these

- 5) For a group of 8 students, the sum of squares of differences in ranks for Mathematics and Statistics marks was found to be 50. What is the value of rank correlation coefficient?
 a) 1 b) 0.80
 c) 0.40 d) 0.75

- 6) Let the two regression lines be $y = -2x + 3$ and $8x = -y + 3$. Then correlation coefficient between x and y is _____.
- a) $\frac{1}{2}$ b) $-\frac{1}{3}$
 c) $\frac{1}{3}$ d) $-\frac{1}{2}$

Q.2 Answer the following. (Any Three) 06

- a) Define impossible event and sure event.
 b) Define axiomatic definition of probability.
 c) Define mutual independence of events A, B and C .
 d) Define positive correlation with one example.
 e) If the $V(X) = 25, r_{xy} = 0.25$ and $b_{yx} = 0.5$ Find the covariance between X and Y .

Q.3 Answer the following. (Any Two) 06

- a) If a die and a coin are tossed simultaneously, write down sample space and the event of getting
 i) head and prime number
 ii) tail and an even number
 b) State and prove addition theorem on probability.
 c) What is the effect of change of origin and scale on regression coefficient?

Q.4 Answer the following. (Any Two) 06

- a) There are 20 tickets numbered 1, 2, ..., 20. One ticket is drawn at random. Find the probability that the ticket bears a number which is
 i) even
 ii) a perfect square
 b) If A, B and C are said to be mutually independent events then $A \cup B$ and C are also independent.
 c) Explain the concept of lines of regression.

Q.5 Answer the following. (Any One) 06

- a) The conditional probability satisfies the axioms of probability measure.
 b) Derive the formula for acute angle between two regression lines.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
BOTANY - II
Plant Ecology and Taxonomy of Angiosperm (G04-0203)**

Day & Date: Monday, 13-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative. 06

- 1) _____ is a stage of xerosere.

a) Phytoplankton	b) Submerged
c) Crustose lichen	d) Amphibian

- 2) P^H of neutral soil is _____.

a) 8	b) 7
c) 10	d) 13

- 3) Example of hydrophyte plant is _____.

a) Hydrilla	b) Argemone
c) Casia	d) Grass

- 4) Sir J. C. Bose Garden is situated at _____.

a) Calcutta	b) Delhi
c) Jaipur	d) Ranchi

- 5) Dicotyledons is divided into _____ subclasses.

a) Polypetalae	b) Gamopetalae
c) Monochlamydeae	d) All of these

- 6) The succession start from water is called _____.

a) Xerosere	b) Hydrosere
c) Both a & b	d) None of these

Q.2 Answer the following. (Any Three) 06

- a) Define plant ecology.
- b) What is xerophyte?
- c) Define taxonomy.
- d) Write the long form of ICBN.
- e) Enlist the parts of flower.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the edaphic factor.
 - b) Write the anatomical adaptation of hydrophytes plant.
 - c) Describe the primitive characters of flower.
- Q.4 Answer the following. (Any Two) 06**
- a) Give the reproductive characters of family Amaryllidaceae.
 - b) Write the morphological adaptation of xerophytes plant.
 - c) Explain the general characters of angiosperms.
- Q.5 Answer the following. (Any One) 06**
- a) Explain the vegetative and reproductive characters family Solanaceae.
 - b) Write a note on climatic factors.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
ZOOLOGY – II
Animal Diversity - II Chordates (G04-0204)**

Day & Date: Wednesday, 15-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.

06

- 1) The notochord extends along the length of body in _____.
 - a) Herdmania
 - b) Balanoglossus
 - c) Amphioxus
 - d) Myxine

- 2) The larva of Petromyzon is _____.
 - a) Tornaria
 - b) Nauplius
 - c) Ammocoete
 - d) Trochophore

- 3) An edible fresh water teleost is _____.
 - a) Catlacatla
 - b) Shark
 - c) Hilsahilsa
 - d) Ray and skate

- 4) Immovable eyelids is characteristics of _____.
 - a) Snakes
 - b) Lizards
 - c) Crocodile
 - d) Turtles

- 5) In Amphibian respiration takes place by _____.
 - a) Gills, lungs, skin and buccal lining
 - b) Gills and lung only
 - c) Skin and gills only
 - d) Gills, lungs, skin and buccal lining only

- 6) The study of reptiles is known as _____.
 - a) Herpetology
 - b) Ornithology
 - c) Ichthyology
 - d) Osteology

Q.2 Answer the following. (Any Three)

06

- a) Write general characters of Petromyzon.
- b) Write general characters of Reptiles with suitable example.
- c) Define parental care and write purpose of it.
- d) Explain Poisonous glands of snake.
- e) Write general characters of class Mammalia one example.

- Q.3 Answer the following. (Any Two) 06**
- a) With suitable diagram explain ammocoetes larva.
 - b) Explain general features of class Mammalia and write special characters of order Rodentia (Rat).
 - c) Explain Parental care in fishes.
- Q.4 Answer the following. (Any Two) 06**
- a) Describe in detailed Adaptive radiation in mammals.
 - b) Write general characters of class Aves and explain any four orders with examples.
 - c) With diagram explain Venomous and non-venomous snakes.
- Q.5 Answer the following. (Any One) 06**
- a) What is venom? Write its types, symptoms and treatments of snakebite.
 - b) Describe Flight adaptations in birds.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April – 2026
ENVIRONMENTAL SCIENCE - II
Environmental Physics and Chemistry (G04-0212)**

Day & Date: Wednesday, 15-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives. (MCQ)**06**

- 1) Which inorganic component in soil can contribute to poor drainage and aeration?

a) Sand	b) Silt
c) Clay	d) Gravel

- 2) The least random state of the water system is _____.

a) ice	b) liquid water
c) steam	d) randomness is same

- 3) Which of the following is NOT an example of force?

a) Weight	b) Friction
c) Temperature	d) Tension in a rope

- 4) Which of the following is an example of a strong base?

a) Ammonia	b) Sodium hydroxide
c) Calcium hydroxide	d) Baking soda

- 5) What is the phenomenon called when light is bent as it passes from one medium to another?

a) Reflection	b) Refraction
c) Diffraction	d) Interference

- 6) What is the approximate percentage of oxygen in the Earth's atmosphere?

a) 10%	b) 20%
c) 30%	d) 40%

Q.2 Answer the following. (Any Three)**06**

- a) Define hardness of water.
- b) What is matter?
- c) Explain refraction of light.
- d) Define soil humus.
- e) Define molarity and normality.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain cation and anion exchange reactions in soil.
 - b) Write note on phenolic compounds in soil.
 - c) Write importance of potassium in soil.
- Q.4 Answer the following. (Any Two) 06**
- a) Write a note on concept spectroscopy.
 - b) Write note on redox reactions.
 - c) Explain role of CFCs in ozone depletion.
- Q.5 Answer the following. (Any One) 06**
- a) Explain types of chemical reactions.
 - b) Write note on composition of atmosphere.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April – 2026
GEOLOGY – II
Mineralogy (G04-0209)**

Day & Date: Thursday, 16-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagram wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Multiple choice question.

06

- 1) Which of the following mineral shows twinning property?
 - a) Andalusite
 - b) Calcite
 - c) Phlogopite
 - d) none of these
- 2) Lower nicol prism is called as _____.
 - a) polarizer
 - b) Analyzer
 - c) condenser
 - d) Pillar
- 3) Quartz shows _____ sets of cleavages.
 - a) I
 - b) II
 - c) III
 - d) None
- 4) _____ mineral belongs to the feldspar group.
 - a) Orthoclase
 - b) Plagioclase
 - c) Microcline
 - d) All of these
- 5) Cleavages in calcite is _____ set.
 - a) 1
 - b) 3
 - c) 2
 - d) 8
- 6) Feldspar minerals having _____ hardness.
 - a) 10
 - b) 7
 - c) 5
 - d) 6

Q.2 Answer the following. (Any Three)

06

- a) Name feldspar group of minerals.
- b) Give the physical properties of hornblende mineral.
- c) Name the parts of upper nicol prism polarizing microscope.
- d) Define streak of mineral, How can it determine?
- e) Define mineral.

- Q.3 Answer the following. (Any Two) 06**
- a) What is 'Hardness and Mohs' scale of hardness?
 - b) Describe physical and optical properties of hornblende and augite.
 - c) Explain relief of minerals.
- Q.4 Answer the following (Any Two) 06**
- a) Describe the form of mineral in physical properties of minerals.
 - b) Describe is pleochroism of minerals.
 - c) Describe Isotropism and Anisotropism in minerals.
- Q.5 Answer the following (Any One) 06**
- a) Describe luster, cleavage and Hardness of minerals.
 - b) Describe optical properties form, twinkling and extension of minerals.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April – 2026
COMPUTER SCIENCE – II
Operating System Fundamentals (G04-0208)**

Day & Date: Thursday, 16-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.**06**

- 1) The layer between the hardware and the user program is _____.
 - a) Operating environment
 - b) System environment
 - c) Operating system
 - d) None of these
- 2) The degree of Multiprogramming is controlled by _____.
 - a) CPU Scheduler
 - b) Context Switching
 - c) Medium term Scheduler
 - d) Long-term Scheduler
- 3) The priority scheduling algorithm suffers by _____.
 - a) Starvation
 - b) Aging
 - c) Deadlock
 - d) All of these
- 4) Virtual memory can be implemented with _____.
 - a) Segmentation
 - b) Paging
 - c) Both A and B
 - d) none of the above
- 5) The operating system where fixed time slot is allocated to each active process is _____.
 - a) real time O.S
 - b) multiprogramming O.S
 - c) batch O.S
 - d) time-sharing O.S
- 6) Which is not the state of a process of the following?
 - a) New
 - b) Old
 - c) Waiting
 - d) Running

Q.2 Answer the following. (Any Three)**06**

- a) What is Time Sharing Operating System?
- b) What is Context Switching?
- c) Define Process Synchronization.
- d) What is Deadlock?
- e) What is Segmentation?

- Q.3 Answer the following. (Any Two) 06**
- a) Explain FCFS scheduling algorithm with Example?
 - b) Explain Swapping with block diagram?
 - c) Explain Dining Philosopher Problem
- Q.4 Answer the following (Any Two) 06**
- a) Explain different Services Provided by Operating System.
 - b) Explain Process Concept with Process states.
 - c) Explain different Characteristics of Deadlock?
- Q.5 Answer the following (Any One) 06**
- a) Explain First in First out Page Replacement policies in Memory Allocation?
 - b) Explain Priority Scheduling Algorithms with example?

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April – 2026
GEOGRAPHY- II
Geomorphology - II (G04-0207)**

Day & Date: Friday, 17-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

- Instructions:**
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Draw neat diagrams wherever necessary.
 - 4) Use of maps stencil is allowed.

Q.1 Choose the correct alternative from the options. 06

- 1) The word Igneous has been derived from a _____ word 'ignis'.

a) French	b) Latin
c) Greek	d) American

- 2) _____ is formed due to the erosional work of wind.

a) Mushroom rock	b) Waterfall
c) Delta	d) Flord

- 3) The moving ice mass down slope under the impact at gravity is called _____.

a) Wind	b) Glacier
c) River	d) Under ground water

- 4) _____ is not an agent of Biological weathering.

a) Animal	b) Human
c) Plant	d) Oxygen

- 5) Cycle of Erosion by postulated by _____.

a) W.M. Davis	b) Jems Hutton
c) Worcester	d) Moore

- 6) _____ rocks are formed by mechanical and chemical weathering process.

a) Organic	b) Metamorphic
c) Inorganic	d) Igneous

Q.2 Answer the following questions. (Any Three) 06

- a) Write the name of erosional landforms of river.
- b) Define the Barkhans.
- c) Characteristics of the Igneous rocks.
- d) Write the name of erosional landforms associated with Aeolian.
- e) What is mean by biotic weathering.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Describe the causes of mass wasting in brief.
 - b) Define the erosional landforms associated with coastal in brief.
 - c) Describe the types of sedimentary rock in brief.
- Q.4 Answer the following questions. (Any Two) 06**
- a) State the stages of cycle of erosion.
 - b) Describe the erosional landform associated with glacial.
 - c) Importance and uses of metamorphic rocks.
- Q.5 Answer the following question. (Any One) 06**
- a) State the types of weathering and describe the physical weathering.
 - b) Describe the landforms associated with depositional work of sea waves.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April – 2026
ELECTRONICS – II
Basic Circuit Theory and Network Analysis (G04-0205)**

Day & Date: Saturday, 18-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.
4) Use of Logarithmic table and scientific calculator is allowed.

Q.1 Choose the correct alternative.

06

- 1) The working principle of a coil is based on _____.
a) self-induction b) mutual induction
c) opposition d) conduction
- 2) The unit of inductive reactance is _____.
a) Farad b) Ohms
c) Henry d) Ampere
- 3) The internal resistance of the ideal voltage source is _____.
a) finite b) infinite
c) zero d) All of these
- 4) An AC quantity has peak value of voltage is 100 V then its RMS value is _____.
a) 0.700 b) 700
c) 7.07 d) 70.7
- 5) The Y parameters are same as _____ circuit parameters.
a) hybrid b) short
c) open d) All of these
- 6) In pure capacitive circuit the relation of applied voltage and current is _____.
a) both are in Phase b) both are out of Phase
c) current is leading d) current is lagging

Q.2 Answer the following. (Any Three)

06

- a) Define resistance. State its practical unit.
- b) Define ideal and practical voltage source.
- c) Define impedance. State its unit.
- d) State maximum power transfer theorem.
- e) Draw the symbol of fixed and variable inductor

Q.3 Answer the following. (Any Two) 06

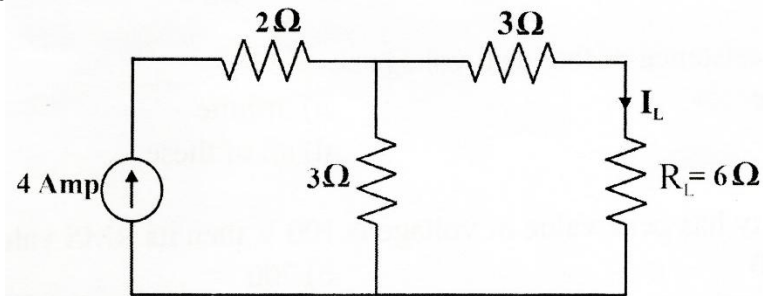
- State Kirchoff's voltage and current law.
- State any four application of capacitor.
- Define active and passive components with their examples.

Q.4 Answer the following (Any Two) 06

- Explain in brief step-down transformer.
- Compare Series and parallel resonance circuit.
- A series LCR circuit has $L = 100 \text{ mH}$, $C = 100 \mu\text{F}$ and $R = 10 \Omega$ which connected to AC source having frequency of 50 Hz. Calculate capacitive reactance.

Q.5 Answer the following (Any One) 06

- Calculate current flowing through load resistance R_L of a following dc network by using Norton's theorem.



- Describe the voltage-current phase relationship in a pure resistor and a capacitor.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
Physics
Need of Electricity in Daily Life (G04-GE-OE-301)**

Day & Date: Thursday, 02-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat labeled diagrams wherever necessary.
4) Use of log table and calculator allowed.

Q.1 Multiple Choice Questions.

06

- 1) _____ is the NOT a use of electricity in daily life.
 - a) Heating our homes
 - b) Powering appliances
 - c) Growing plants
 - d) Lighting our homes

- 2) The practical unit of electrical energy used in household billing is the _____.
 - a) Watt
 - b) Kilowatt-hour
 - c) Kilowatt
 - d) Joule

- 3) _____ is the Ohm's law.
 - a) $P = IV$
 - b) $I = P/V$
 - c) $V = IR$
 - d) $R = V/I$

- 4) An electrical energy generated through _____ is called as green energy.
 - a) Coal
 - b) natural gas
 - c) Wind
 - d) Oil

- 5) _____ is a renewable organic material that comes from living organism such as plants and animal.
 - a) Oil
 - b) Batteries
 - c) Coal
 - d) Biomass

- 6) The purpose of an electric meter is to in a household is to _____.
 - a) generate electric energy
 - b) protect against electric shocks
 - c) control the flow of electricity
 - d) measure the amount of electric energy used

- Q.2 Answer the following. (Any Three) 06**
- a) A 12-Volt battery is connected to a circuit with resistance of 4 ohms. Calculate the current flowing through the circuit.
 - b) What is electricity and how it is measured?
 - c) List any two methods of electricity generation.
 - d) Draw the circuit diagram to verify Ohm's law.
 - e) List any two ways to save electricity.
- Q.3 Answer the following. (Any Two) 06**
- a) Discusses the advantages and disadvantages of electric energy.
 - b) Explain the use of electricity in entertainment,
 - c) Distinguish between Direct current (DC) and Alternating current (AC).
- Q.4 Answer the following. (Any Two) 06**
- a) Write a short note on advantages non-conventional energy sources.
 - b) Discuss how electricity transmitted from power plants to home.
 - c) State any three applications of electricity highlighting their significance.
- Q.5 Answer the following. (Any One) 06**
- a) State and explain the methods of electricity conservation.
 - b) Discuss the commercial and residential energy audit.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
Chemistry
Chemistry for Competitive Examination - I (G04-GE-OE-302)**

Day & Date: Thursday, 02-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.**06**

- 1) Proton is a ____ subatomic particle in the atomic nucleus.
 - a) negatively charged
 - b) positively charged
 - c) electrically neutral
 - d) both a & b
- 2) ____ is non-crystalline allotrope of carbon.
 - a) Diamond
 - b) Graphite
 - c) Fullerene
 - d) Coal
- 3) Generally, bonds in carbon compound are _____.
 - a) Covalent
 - b) Ionic
 - c) co-ordinate
 - d) Mdetallic
- 4) Neutron was discovered by _____.
 - a) J.J Thomson
 - b) Chadwick
 - c) Rutherford
 - d) Priestley
- 5) ____ is number of moles of solute dissolved in one liter solution.
 - a) Molarity
 - b) Normality
 - c) Polarity
 - d) Molality
- 6) The bond formed by donation of electron pair by one atom to other is called as _____.
 - a) covalent bond
 - b) ionic bond
 - c) coordinate bond
 - d) None of these

Q.2 Answer the following. (Any Three)**06**

- a) Define the terms atomic number and atomic mass.
- b) Give electron-dot structure and line structure of methane molecule.
- c) What are functional groups of alcohol, aldehyde, carboxylic acid and amine.
- d) What is critical temperature?
- e) Explain octet rule

- Q.3 Attempt the following. (Any Two) 06**
- a) State and explain Aufbau principle.
 - b) What is hydrocarbon? Give one example each of saturated and unsaturated hydrocarbons.
 - c) Explain the terms: normality and molality.
- Q.4 Answer the following. (Any Two) 06**
- a) Give any two chemical reactions of carbon compound.
 - b) Explain characteristics of different states of matter.
 - c) What are sigma and pi bonds?
- Q.5 Attempt the following. (Any One) 06**
- a) Explain Rutherford's nuclear model and Thomson's model of atom.
 - b) Discuss in detail covalent and ionic bond.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
GEOLOGY
Geomorphology (G04-GE-OE-309)**

Day & Date: Thursday, 02-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagram wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Multiple Choice Question: (MCQ) 06

- 1) The study of the earth is known as _____.
 - a) Geology
 - b) Geodetic
 - c) Geometry
 - d) None of these

- 2) The final product of physical and chemical weathering of rocks is _____.
 - a) Soil
 - b) Murum
 - c) Tors
 - d) Talus

- 3) Landscapes reflect a balance between _____ forces including tectonics, volcanic, and earthquake.
 - a) Exogenic
 - b) Endogenic
 - c) External
 - d) None of these

- 4) Every landform has history and is the product of _____.
 - a) River
 - b) Wind
 - c) Glacier
 - d) All of these

- 5) Continental drift theory put forward by _____.
 - a) A. Homes
 - b) Frank B
 - c) Alfred Wegener
 - d) None of these

- 6) The plate tectonic suppose that the sphere of the Earth is made up of _____ major plates and several minor plates.
 - a) 7
 - b) 13
 - c) 10
 - d) 9

Q.2 Answer the following questions. (Any Three) 06

- a) Name the plate boundaries.
- b) What is plate boundary and margin?
- c) Name agent of weathering.
- d) Define geomorphology.
- e) What are the final product of rock weathering?

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain divergent plate boundary.
 - b) What is mid oceanic ridge?
 - c) Describe the geological work of wind.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Describe the sea floor spreading.
 - b) Describe the geological work of river.
 - c) Describe the basic principles of geomorphology.
- Q.5 Answer the following question. (Any One) 06**
- a) Describe the continental drift theory.
 - b) Describe endogenic process.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
Botany
Terrace Garden (G04-GE-OE-303)**

Day & Date: Thursday, 02-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat labeled diagram wherever necessary.
3) Figures to the right indicate full marks.
4) Use of Log tables and calculator is allowed.

Q.1 Choose the correct alternatives from the options.**06**

- 1) _____ is the primary purpose of a trowel in terrace gardening.
 - a) Digging and transplanting plants
 - b) Watering plants
 - c) Pruning plants
 - d) fertilizing plants

- 2) _____ composting suitable for terrace gardening.

a) Vermicomposting	b) Hot composting
c) Cold composting	d) Anaerobic composting

- 3) _____ is a common pest in terrace garden.

a) Earthworms	b) Beneficial insects
c) Aphids	d) Ladybugs

- 4) _____ method is used to control whiteflies in a terrace garden.

a) Neem oil	b) Yellow sticky traps
c) Insecticidal soap	d) All the above

- 5) Terrace gardening is also known as _____.

a) Hydroponics	b) Rooftop gardening
c) Indoor gardening	d) Backyard farming

- 6) _____ is essential for good drainage in terrace gardening.

a) Cement	b) Stone and pebbles
c) Sandbags	d) Sand only

Q.2 Answer the following questions. (Any Three)**06**

- a) What is purpose of terrace gardening?
- b) What type of soil is best for container gardening?
- c) Enlist methods of composting.
- d) Write any 2 precautions taking during terrace gardening.
- e) Name any four plants suitable for terrace gardens.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Describe applications of fertilizers.
 - b) What are the benefits of terrace gardening?
 - c) How to prepare organic garden soil for terrace gardening?
- Q.4 Answer the following questions. (Any Two) 06**
- a) Describe the natural parameters for the terrace gardening.
 - b) What is composting? Describe its types.
 - c) Describe any one method of terrace gardening.
- Q.5 Answer the following question. (Any One) 06**
- a) Describe the disease management strategies in terrace gardening.
 - b) Explain in detail equipment and their uses in Terrace gardening.

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Set **P**

B.Sc. (Plain) (Semester - III) (New) (NEP CBCS)
Examination: March/April – 2026
Zoology
Forensic Science (G04-GE-OE-304)

Day & Date: Thursday, 02-04-2026
 Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
 2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives. (MCQ)**06**

- 1) In ____ stage of dead body decaying the insects deposit their eggs on dead body to feeds their maggots.
 - a) Dry stage
 - b) Bloated stage
 - c) Decay stage
 - d) Fresh stage
- 2) Use of scientific methods and techniques in criminal investigations is known _____.
 - a) Forensic Science
 - b) Data Science
 - c) Foreign Science
 - d) Gemology Science
- 3) First Forensic science laboratory in India was established in _____ in year 1952.
 - a) Maharashtra
 - b) Kolkata
 - c) Goa
 - d) Kerela
- 4) Which of the following is a biological evidence used in forensic investigation.
 - a) Paint
 - b) Cloth fibers
 - c) Blood
 - d) Gun shot residues
- 5) Environmental crime includes _____.
 - a) Cyber Extortion
 - b) wildlife trafficking
 - c) Digital arrest
 - d) Glidding
- 6) _____ is the study of the harmful effects of chemicals, physical agents, and biological substances on living organisms.
 - a) Palentology
 - b) Pathology
 - c) Ornithology
 - d) Toxicology

- Q.2 Answer the following questions. (Any Three) 06**
- a) Discuss scope of forensic science.
 - b) What is forensic pathology.
 - c) What is wildlife trafficking.
 - d) Define toxicology.
 - e) What is Environmental crime.
- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain forensic science in wild life protection and investigation.
 - b) Write on physical evidences in forensic analysis.
 - c) Explain chemical evidence in forensic investigations.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Write on DNA profiling in technique used in forensic science.
 - b) Write on digital forensic science.
 - c) Discuss use of insects in forensic studies.
- Q.5 Answer the following question. (Any One) 06**
- a) Write on biological evidences in forensic analysis.
 - b) Discuss on forensic laboratories in India.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
MATHEMATICS
Boolean Algebra (G04-GE-OE-310)**

Day & Date: Thursday, 02-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative for each of the following. **06**

- 1) In D_{70} i.e. the set of all positive integers which are divisors of 70, unity element is _____.

a) 1	b) 0
c) 70	d) 2

- 2) Let B denote the Boolean Algebra then for all $x, y \in B$ the symmetric difference is defined as $x \oplus y =$ _____.

a) $(x - y) + (y - x)$	b) $(x - x') + (y - y')$
c) $(x + y) + (y - x)$	d) $(x + x') + (y + y')$

- 3) If b and c are distinct atoms then $b \cdot c =$ _____.

a) 1	b) 0
c) ϕ	d) B

- 4) An OR gate receives inputs x_1 and x_2 then $x_1 + x_2 =$ _____.

a) $\begin{cases} 1 & \text{if } x_1 = 1 \text{ or } x_2 = 1 \\ 0 & \text{otherwise} \end{cases}$	b) $\begin{cases} 0 & \text{if } x_1 = 1 \text{ or } x_2 = 1 \\ 1 & \text{otherwise} \end{cases}$
c) $\begin{cases} 1 & \text{if } x_1 = 0 \text{ or } x_2 = 1 \\ 0 & \text{if } x_1 = 1 \text{ or } x_2 = 1 \end{cases}$	d) $\begin{cases} 1 & \text{if } x_1 = 1 \text{ and } x_2 = 1 \\ 0 & \text{otherwise} \end{cases}$

- 5) If a fundamental product P is contained in another fundamental product Q then $P + Q =$ _____.

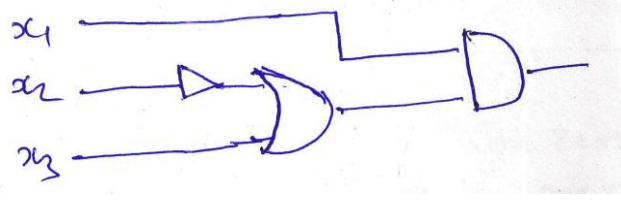
a) Q	b) PQ
c) P	d) Q'

- 6) In logic circuits the expression $(x \cdot y) + (x \cdot y') =$ _____.

a) x	b) y
c) 1	d) 0

Q.2 Attempt any three of the following. **06**

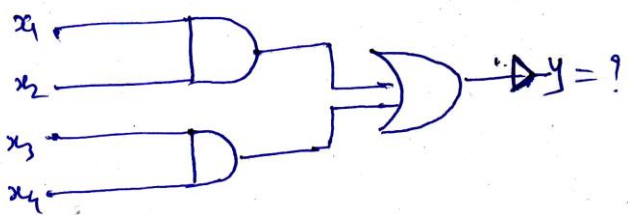
a) Write the Boolean expression for the following.



- b) Explain the NOR-GATE with suitable example.
- c) Reduce the expression to the sum of products form
 $E_1(x, y, z) = (x'y)'(x' + xyz')$
- d) For all $x, y \in B$ prove that
 $x \cdot (x' + y) = x \cdot y$
- e) Prove that $x \oplus z = 0$ iff $x = z$

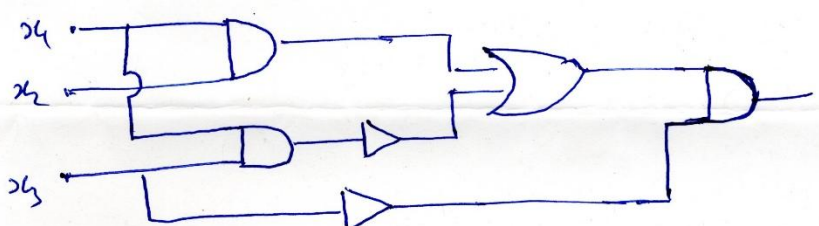
Q.3 Attempt any two of the following. **06**

- a) State and prove Absorption laws.
- b) Prove the lattice diagram of D_{70}
- c) Write the Boolean expression for the following.



Q.4 Attempt any two of the following. **06**

a) Simplify the logic circuit and draw the equivalent logic circuit.



- b) Prove that every non zero element of a finite Boolean Algebra B is preceded by at least one atom.
- c) Define AND GATE with suitable example.

Q.5 Attempt any one of the following. **06**

- a) For $x, y \in B$ where B is Boolean Algebra prove that $(x + y)' = x' \cdot y'$
- b) Reduce the following expression to the sum of products from
 $E(x, y, z) = ((x y)'z)'((x' + z)(y' + z))'$

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
Statistics
Probability Theory (G04-GE-OE-311)**

Day & Date: Thursday, 02-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of calculator is allowed.

Q.1 Choose the correct alternative from the options. (MCQ) 06

- 1) The sample space of a deterministic experiment contains _____.
 - a) Only one sample point
 - b) More than one sample point
 - c) Countably infinite number of sample point
 - d) Infinite sample points

- 2) In tossing of three coins, probability of getting at most one head is _____.

a) $\frac{3}{8}$	b) $\frac{7}{8}$
c) $\frac{1}{2}$	d) $\frac{1}{8}$

- 3) Conditional probability $P(A/B)$ is defined only when _____.

a) A is a sure event	b) B is a sure event
c) B is an impossible event	d) B is not an impossible event

- 4) If A and B are two independent events then $P(A/B)$ is equal to _____.

a) $P(A)$	b) $P(B)$
c) $P(A \cap B)$	d) $P(A \cup B)$

- 5) Consider the following probability distribution of X .

X	:	0	1	2
$P(x)$:	k	$2k$	k

 The value of k is

a) $\frac{1}{2}$	b) $\frac{3}{4}$
c) $\frac{1}{4}$	d) 1

- 6) If $\mu'_1 = 4$ and $\mu'_2 = 25$, then variance is _____.

a) 1	b) 2
c) 5	d) 9

Q.2 Answer the following. (Any Three) 06

- Define sure event with suitable example.
- An urn contains 25 tickets numbered 1,2,3,425. One ticket is drawn at random. Compute the probability that it is a multiple of 5 or 7.
- Define mutually independent events.
- Define probability mass function of r.v. X .
- Define expectation of r.v. X .

Q.3 Answer the following. (Any Two) 06

- A class of 100 students appeared for two examinations 60 passed the first examination, 50 passed the second examination and 30 passed both examinations. Find the probability that a student selected at random has failed in both the examination.
- If A and B are mutually exclusive events. Then prove that
 - $P(A/B) = 0$
 - $P(A/\bar{B}) = \frac{P(A)}{1-P(B)}$
- With usual notations, prove that
 - $E(aX + b) = aE(X) + b$
 - $V(aX + b) = a^2V(X)$

Q.4 Answer the following. (Any Two) 06

- If $P(A) = 0.3, P(\bar{B}) = 0.22, P(A \cap B) = 0.16$. Evaluate
 - $P(A \cap \bar{B})$
 - $P(\bar{A} \cap \bar{B})$
- Show that if A and B are independent events, then \bar{A} and \bar{B} are also independent events.
- If the p.g.f. of X is given by $P_x(s) = \frac{s^2+s+1}{3}$ Find mean and variance of X .

Q.5 Answer the following. (Any One) 06

- A r. v. X has the following probability distribution.

X	:	1	2	3	4	5	6	7
$P(x)$:	$\frac{1}{8}$	$\frac{2}{8}$	$\frac{3}{8}$	$\frac{1}{64}$	$\frac{9}{64}$	$\frac{2}{64}$	$\frac{4}{64}$

Find

- $P(2 < X < 6)$
 - $P(X \geq 5) P(X \geq 5)$
 - distribution function of X
- State and prove Baye's theorem on probability.

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Set **P**

B.Sc. (Plain) (Semester - III) (New) (NEP CBCS)
Examination: March/April - 2026
COMPUTER SCIENCE
Software Engineering (G04-GE-OE-308)

Day & Date: Thursday, 02-04-2026
 Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
 2) Figures to right indicate full marks.

Q.1 Choose correct alternative.**06**

- 1) In ____ Model, where the output of one phase is the input to the next one phase.
 - a) Process Model
 - b) Waterfall Model
 - c) Prototyping
 - d) Spiral
- 2) The specific techniques used for collecting data are called as _____.
 - a) Interview
 - b) Feasibility Study
 - c) Fact Finding Technique
 - d) None of these
- 3) HIPO stands for Hierarchical Input Processing Outstanding.
 - a) True
 - b) False
- 4) Which of the following is not element of Data Dictionary (DD)?
 - a) Range
 - b) Data group
 - c) Data type
 - d) Length
- 5) Which of the following feasibility is related to cost benefit analysis aspects?
 - a) Operational
 - b) Technical
 - c) Economical
 - d) None of these
- 6) The objective of testing is _____.
 - a) To uncover errors
 - b) Debugging
 - c) to gain modularity
 - d) to analyze system

Q.2 Answer the following questions. (Any Three)**06**

- a) What is System Analysis?
- b) What is RAD model?
- c) Write down any four Advantages of Prototype model.
- d) What is Probabilistic system?
- e) What are the roles of system analyst.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain V-shape model with diagram.
 - b) Explain Questionnaire Fact finding technique.
 - c) What are the types of risk?
- Q.4 Answer the following questions. (Any Two) 06**
- a) Discuss Spiral model in details.
 - b) Short note on Data Dictionary.
 - c) Explain types of software maintenance.
- Q.5 Answer the following question. (Any One) 06**
- a) What are the fact finding techniques? Describe Interview and Observation technique.
 - b) Explain HIPO chart with example.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
Electronics
Solar Energy and Electronics (G04-GE-OE-305)**

Day & Date: Thursday, 02-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative (MCQ) 06

- 1) The major source of solar energy is _____.
 - a) Sunlight
 - b) Moonlight
 - c) Wind
 - d) Earth's core
- 2) The unit of solar radiation measurement is _____.
 - a) Watt per square meter
 - b) Joule
 - c) Lumen
 - d) Ampere
- 3) _____ type of solar cell has highest efficiency.
 - a) Thin film
 - b) Polycrystalline
 - c) Monocrystalline
 - d) Amorphous
- 4) The I-V characteristics of solar cell are influenced mainly by _____.
 - a) Wind speed
 - b) Temperature and irradiance
 - c) Pressure
 - d) Humidity
- 5) The function of MPPT in PV system is _____.
 - a) Reduce heat
 - b) Track maximum voltage
 - c) Extract maximum power
 - d) Store charge
- 6) Which storage device is commonly used in solar systems?
 - a) Inductor
 - b) Capacitor
 - c) Battery
 - d) Transformer

Q.2 Answer the following questions. (Any Three) 06

- a) Define solar spectrum.
- b) State any two applications of solar energy.
- c) Write principle of photovoltaic effect.
- d) List different types of solar cells.
- e) What is the role of charge controller in PV system?

- Q.3 Answer the following questions. (Any Two) 06**
- a) Differentiate between standalone and grid-connected solar PV system.
 - b) Explain the importance of sizing PV modules.
 - c) State advantages of IoT-based solar monitoring systems.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain IV characteristics of a solar cell.
 - b) Write a short note on simulation tools for solar projects.
 - c) Explain solar lighting systems with neat sketch.
- Q.5 Answer the following question. (Any One) 06**
- a) Discuss the role of power converters in solar PV systems.
 - b) Explain the integration of smart solar systems with microgrids.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
MICROBIOLOGY
Microbiology in Agriculture (G04-GE-OE-306)**

Day & Date: Thursday, 02-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.

Q.1 Choose correct alternative. (MCQ) 06

- 1) What is the primary role of nitrogen-fixing bacteria in agriculture?
 - a) Photosynthesis
 - b) Nitrogen fixation
 - c) Respiration
 - d) Cell division

- 2) Which microorganism is commonly used in the production of biofertilizers?
 - a) *Escherichia coli*
 - b) *Klebsiella*
 - c) *S. cerevisiae*
 - d) *Azotobacter*

- 3) Which of the following is an example of a biopesticide?
 - a) Glyphosate
 - b) Malathion
 - c) *Bacillus thuringiensis*
 - d) Paraquat

- 4) Mycorrhizae are symbiotic associations between plant roots and _____.
 - a) Fungi
 - b) Bacteria
 - c) Viruses
 - d) Nematodes

- 5) Which of the following is not fertilizer producing bacteria?
 - a) *Nostoc*
 - b) *Anabena*
 - c) *Azotobacter*
 - d) *Clostridium*

- 6) What is the main purpose of using microbial inoculants in agriculture?
 - a) Soil sterilization
 - b) Pest control
 - c) Disease prevention
 - d) Enhancing plant growth

Q.2 Answer the following questions. (Any Three) 06

- a) Define Pesticides.
- b) Define Chemical fertilizers.
- c) Define Nitrogen fixation.
- d) Define Biopesticides.
- e) What is decomposition?

- Q.3 Answer the following questions. (Any Two) 06**
- a) Nitrogen Fixers.
 - b) Viral Biopesticide.
 - c) Organic matter decomposers.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Write a note on Advantages and disadvantages of Biofertilizers.
 - b) Explain the harmful effects of Pesticides.
 - c) Explain the role of *Bacillus thuringiensis* as Biopesticide.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain in brief the mass production of *Rhizobium* and *Azotobacter*.
 - b) Write a detailed note on Preparation on Bioinoculants and its application.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
GEOGRAPHY
Tourism Geography (G04-GE-OE-307)**

Day & Date: Thursday, 02-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.
3) Draw neat diagrams & give equations wherever necessary.

Q.1 Choose correct alternative. (MCQ)**06**

- 1) Tourism Geography is a sub branch of ____ Geography.
 - a) Population
 - b) Economic
 - c) Social
 - d) Cultural
- 2) ____ is nature of tourism.
 - a) Production
 - b) Trade
 - c) Composite
 - d) Unproductive
- 3) ____ is a main objectives of Eco-tourism.
 - a) Conservation of Nature
 - b) Trade
 - c) Consumer
 - d) Production
- 4) ____ Physical factor is affecting on tourism.
 - a) Hotel
 - b) Industry
 - c) Climate
 - d) Transportation
- 5) Tourism is formed a _____.
 - a) Employment
 - b) Poverty
 - c) Poor
 - d) None of these
- 6) The word 'tourist' first used in the world in the year of _____.
 - a) 1970
 - b) 1971
 - c) 1972
 - d) 1973

Q.2 Answer the following questions. (Any Three)**06**

- a) Define the concept of Tourism.
- b) What is Tourism Geography?
- c) Define the concept of Ecotourism.
- d) Define the concept of marketing tourism.
- e) Define the concept of Agro-tourism.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain the cultural factor affecting on tourism.
 - b) Explain the significance of Tourism Geography.
 - c) Explain the nature of Tourism Geography.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain the different tour agencies.
 - b) Explain the tourism planning process.
 - c) Explain the Indian tourism centre.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain the types of Tourism.
 - b) Explain the scope of Tourism Geography.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
ENVIRONMENTAL SCIENCE
Life and Its Environment (G04-GE-OE-312)**

Day & Date: Thursday, 02-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative.**06**

- 1) Which of the following scientists conducted the famous experiment simulating early Earth's atmosphere?
 - a) Charles Darwin
 - b) Louis Pasteur
 - c) Stanley Miller and Harold Urey
 - d) Alexander Oparin
- 2) The Earth is estimated to be about _____.
 - a) 3.5 billion years old
 - b) 4.5 billion years old
 - c) 2.5 billion years old
 - d) 6.5 billion years old
- 3) The theory that life originated from non-living matter is called _____.
 - a) Biogenesis
 - b) Abiogenesis
 - c) Panspermia
 - d) Evolution
- 4) The main mechanism of evolution proposed by Charles Darwin is _____.
 - a) Genetic drift
 - b) Mutation
 - c) Natural selection
 - d) Hybridization
- 5) The concept of inheritance of acquired characters was given by _____.
 - a) Lamarck
 - b) Darwin
 - c) Wallace
 - d) Mendel
- 6) The five kingdoms proposed by Whittaker are _____.
 - a) Monera, Protista, Fungi, Plantae, Animalia
 - b) Bacteria, Fungi, Plants, Animals, Algae
 - c) Prokaryotes, Eukaryotes, Plants, Animals, Fungi
 - d) Archaea, Bacteria, Protista, Plantae, Animalia

Q.2 Answer the following questions. (Any Three)**06**

- a) What is abiogenesis?
- b) What did Miller's experiment demonstrate?
- c) What is natural selection?
- d) What is the "struggle for existence"?
- e) Why was Whittaker's classification significant?

- Q.3 Answer the following questions. (Any Two) 06**
- a) Write a short note on the nature of the earliest organisms?
 - b) Explain Darwin's theory of natural selection?
 - c) What is meant by species evolution?
- Q.4 Answer the following questions. (Any Two) 06**
- a) What is phylogenetic relationship? How is it determined?
 - b) What is astrobiology? What is its importance?
 - c) Mention the merits of Whittaker's classification?
- Q.5 Answer the following questions. (Any One) 06**
- a) Describe the chemical evolution of life on Earth?
 - b) Describe the general characteristics and economic importance of bacteria?

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
Plant Protection
Terrace Garden (G04-GE-OE-313)**

Day & Date: Thursday, 02-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.

Q.1 Choose correct alternatives: 06

- 1) Where are the types of terrace farming _____.
 - a) Bench farming
 - b) Ridge farming
 - c) All of the above
 - d) None of these
- 2) Terrace gardening or farming is practiced in the areas where land is _____.
 - a) too hot
 - b) too wet
 - c) too steep
 - d) prone to insects
- 3) Terrace farming is a vital method for conserving _____.
 - a) Natural resources
 - b) Sand
 - c) Stone
 - d) None of these
- 4) Terrace farming is practiced in mountainous region to prevent _____.
 - a) Soil erosion
 - b) Soil binding
 - c) Colouring
 - d) None of these
- 5) Main function of biofertilizer is _____.
 - a) To increase chemical process
 - b) To increase physiological process
 - c) To increase biological process
 - d) To increase photosynthetic process
- 6) In which one of the following states is terrace gardening or cultivation practiced?
 - a) Haryana
 - b) Punjab
 - c) Uttarakhand
 - d) Planes of U.P.

Q.2 Answer the following questions. (Any Three) 06

- a) What is terrace gardening or roof gardening?
- b) What is purpose of terrace gardening?
- c) Write on composting for roof gardening.
- d) Which vegetables can be grown in the terrace gardening?
- e) What are the things required for a terrace garden?

- Q.3 Answer the following questions. (Any Two) 06**
- a) Which equipment's required for terrace gardening?
 - b) How to prepare the pesticides & manures for the terrace garden?
 - c) What kind of soil & fertilizers used for terrace gardening?
- Q.4 Answer the following. (Any Two) 06**
- a) Which type of plants are suitable for terrace gardening?
 - b) What are the benefits of a terrace garden?
 - c) How do you maintain the terrace garden?
- Q.5 Answer the following. (Any One) 06**
- a) How will you take, precaution, during the terrace gardening?
 - b) How will you maintain, terrace gardens plant diseases?

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
ENGLISH
Reading Texts in Indian English - I (G04-ENG-301)**

Day & Date: Saturday, 04-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative from the options:**06**

- 1) Where is Miss Pushpa departing to?
 - a) Another city in India
 - b) Foreign country
 - c) Her hometown
 - d) Back to her office

- 2) What does the narrator mean by "the sweat of the soul"?
 - a) Physical tiredness
 - b) Emotional and spiritual effort during the journey
 - c) Fear of the sun
 - d) Dirt on the body

- 3) What is the main message of the poem "The Ghaghra in Spate"?
 - a) Nature is gentle and kind
 - b) Humans should respect nature's power and endure its challenges
 - c) Floods can be stopped by prayers
 - d) Villagers live without any fear

- 4) What is the first step mentioned in the poem to kill a tree?
 - a) Uproot it entirely
 - b) Cut the bark and cut the roots
 - c) Burn the leaves
 - d) Water it less

- 5) Mulk Raj Anand was born in _____ year.
 - a) 1905
 - b) 1910
 - c) 1915
 - d) 1920

- 6) The narrator spent his time in the banyan tree by _____.
 - a) Flying kites
 - b) Reading books
 - c) Writing stories
 - d) Watching birds

Q.2 Answer the following. (Any Two)**06**

- a) Describe the fight between the mongoose and the cobra.
- b) Describe the friendship between Dr. Raman and Gopal?
- c) Write in brief about the poem "On Killing A Tree"
- d) What difficulties did the pilgrims face during the journey?

Q.3 Write short notes. (Any One) 06

- a) Write a summary of the poem "Goodbye Party for Miss Pushpa T.S"
- b) What is the main message of the poem "The Ghaghra in Spate"?

Q.4 Answer the following. (Any One) 12

- a) What quality of Dr. Raman is highlighted in the story "The Doctor's Word"?
- b) What is the central theme of the story "The Lost Child"?

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
PHYSICS - III
General Physics (G04-DSC1-0301)**

Day & Date: Monday, 06-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Multiple choice questions:**06**

- 1) Scalar triple product is also known as ____ product.
 - a) volume
 - b) box
 - c) plane
 - d) cross
- 2) Divergence of vector field is ____ quantity.
 - a) vector
 - b) scalar
 - c) non-zero
 - d) negative
- 3) In precessional motion, the precessional torque has its axis ____ with the axis of rotation of the disc.
 - a) perpendicular
 - b) parallel
 - c) inclined at 30°
 - d) inclined at 60°
- 4) Gyrocompass is used to determine _____.
 - a) angle of dip
 - b) geographic north south direction
 - c) distance between two places
 - d) magnetic north south
- 5) Bending moment of a beam is _____.
 - a) directly proportional to modulus of rigidity
 - b) inversely proportional to modulus of rigidity
 - c) directly proportional to radius of curvature
 - d) inversely proportional to radius of curvature
- 6) Searle's Viscometer is used to determine the viscosity of _____.
 - a) highly viscous liquid
 - b) low viscous liquid
 - c) any liquid
 - d) gas

Q.2 Answer the following questions. (Any Three)**06**

- a) Define the term terminal velocity.
- b) What is nutation?
- c) Define vector triple product.
- d) What do you mean by:
 - i) neutral axis
 - ii) neutral surface
- e) Write SI and CGS unit of coefficient of viscosity.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain Divergence of a vector.
 - b) Obtain an equation for period of a gyroscope.
 - c) Derive an expression for bending moment of a uniformly bent beam.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain construction and working of Searle's viscometer.
 - b) Explain scalar triple product.
 - c) Show that torque is necessary for precession.
- Q.5 Answer the following question. (Any One) 06**
- a) Describe Ostwald viscometer and explain how the coefficient of viscosity of two liquids can be compared by the method of capillary flow.
 - b) Describe Searle's method to determine young's modulus and modulus of rigidity of material of a wire.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
CHEMISTRY - III
Organic Chemistry (G04-DSC1-0303) / (G04-DSC1-0325) /
(G04-DSC1-0327)**

Day & Date: Monday, 06-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative. (MCQ) 06

- 1) Shift of absorption maxima to a longer wavelength is known as ____ shift.

a) Bathochromic	b) Hypsochromic
c) Hyperchromic	d) Hypochromic

- 2) In Beckmann transformation the product obtained is _____.

a) Oxime	b) Ketone
c) Aldehyde	d) N- substituted amide

- 3) E and Z nomenclature is used to determine the configuration of ____ isomers.

a) Optical	b) Conformational
c) Geometrical	d) None of these

- 4) In ethylene chlorohydrin, the position of –Cl and –OH with respect to each other is _____.

a) 1:2	b) 1:3
c) 1:4	d) 1:5

- 5) Aldehydes and ketones undergo ____ type of reactions.

a) Electrophilic addition	b) Nucleophilic addition
c) Elimination	d) All of these

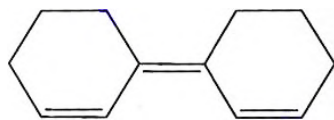
- 6) Absorption of UV radiations by organic molecules leads to ____ transitions.

a) Vibrational	b) Rotational
c) Electronic	d) No transition occurs

Q.2 Answer the following questions. (Any Three)

06

a) Calculate λ_{max} for the following compound.



- b) Write uses of malic acid.
- c) What is Grignard reagent? How is it prepared?
- d) What is crossed Aldol condensation reaction?
- e) Write the names of different types of electronic transitions in UV spectroscopy.

Q.3 Attempt the following questions. (Any Two)

06

- a) Describe use of UV spectroscopy in determination of stereochemistry of organic compounds.
- b) How will you determine the configuration of aldoximes?
- c) What is Benzoin condensation reaction? Write mechanism involved in it.

Q.4 Answer the following questions. (Any Two)

06

- a) Write note on Beer-Lambert's law.
- b) Write reactions involved in the bromination and oxidation of cinnamic acid.
- c) Explain Perkin's reaction with mechanism.

Q.5 Answer the following question. (Any One)

06

- a) Describe conformational analysis of n-butane with the help of energy profile diagram.
- b) Write two methods of formation of phthalic acid and its uses.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
BOTANY - III
Plant Anatomy (G04-DSC1-0305)**

Day & Date: Monday, 06-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat, labelled diagram wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Choose correct alternative:**06**

- 1) The meristem dividing in two vertical planes is called _____.
a) promeristem b) procambium
c) mass meristem d) plate meristem
- 2) Tunica- carpus theory is based on _____.
a) Direction of cell division b) Plane of cell division
c) Rate of shoot tip growth d) Regions of meristematic activity
- 3) Vessels are mostly present in _____.
a) Gymnosperms b) Angiosperms
c) Pteridophytes d) Bryophytes
- 4) Sclerenchyma is _____.
a) Living tissue b) Only dead tissue
c) Dead & mechanical d) Dead and non-mechanical
- 5) _____ tissues transport water and nutrients within the plant.
a) Epidermal tissue b) Ground tissue
c) Meristem d) Vascular tissue
- 6) Non-porous and soft wood is found in _____.
a) Gymnosperms b) Dicots
c) Monocots d) Pteridophytes

Q.2 Answer the following questions. (Any Three)**06**

- a) Define Meristem.
- b) Define vascular Bundle.
- c) Describe the structure of stomata.
- d) Give any two functions of epidermis.
- e) Define anomalous secondary growth.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Describe apical cell theory.
 - b) Describe any three types of vascular bundles, give example of each.
 - c) Give the detail account of Mechanical tissues.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Give brief account of basic structure of wood and its type.
 - b) Explain with neat labeled diagrams any three external secretory structures.
 - c) Draw a neat labeled diagram of monocot root.
- Q.5 Answer the following question. (Any One) 06**
- a) Describe in brief the anomalous secondary growth in *Dracaena* stem.
 - b) Describe in brief structure and functions of simple tissue.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
ZOOLOGY – III
Cell Biology (G04-DSC1-0307)**

Day & Date: Monday, 06-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative. (MCQ) 06

- 1) The energy generated from mitochondria is called _____.
 - a) ADP
 - b) MTP
 - c) ATP
 - d) GTP

- 2) Ribosomes are concerned with _____.
 - a) Energy formation
 - b) Protein synthesis
 - c) Carbohydrate synthesis
 - d) Lipid synthesis

- 3) _____ called hereditary material.
 - a) Peroxisomes
 - b) Ribosome
 - c) Lysosomes
 - d) Chromosomes

- 4) Which of the following is known as the suicide bag of cell?
 - a) Lysosome
 - b) Mitochondria
 - c) Golgi complex
 - d) Nuclei

- 5) In which of the following cell nucleus is not present _____.
 - a) Eukaryotic cell
 - b) Prokaryotic cell
 - c) Both of the above
 - d) None of the above

- 6) Ion carriers may be found in the following places _____.
 - a) Plasma membranes
 - b) Cell wall
 - c) Nucleus
 - d) Cellular space

Q.2 Answer the following questions. (Any Three) 06

- a) Virus
- b) Symport
- c) Mitochondria-semi-autonomous nature
- d) Microtubules
- e) Nucleolus

- Q.3 Answer the following questions. (Any Two) 06**
- a) Functions of Endoplasmic Reticulum.
 - b) Describe structure of nucleus.
 - c) Explain types of chromosomes.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Describe mitosis.
 - b) Explain ultrastructure and function of mitochondria.
 - c) Describe active transport and passive transport.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain eukaryotic cell.
 - b) Describe ultrastructure and function of Golgi apparatus.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
ELECTRONICS - III
Digital Electronics (G04-DSC1-0309)**

Day & Date: Monday, 06-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:**
- 1) All questions are compulsory.
 - 2) Draw neat diagram and give equation wherever necessary.
 - 3) Figures to the right indicate full marks.
 - 4) Use of Logarithmic table and scientific calculator is allowed.

Q.1 Choose the correct alternative.

06

- 1) A De-multiplexer are also called as _____.
 - a) data selectors
 - b) data adders
 - c) data distributors
 - d) data converters

- 2) Racing around condition of J-K flip flop means _____.
 - a) toggle single time
 - b) output is high
 - c) output is low
 - d) toggle more than once

- 3) In _____ type shift registers the output of last flip flop is connected to the data input of first flip flop.
 - a) ring
 - b) twisted ring
 - c) decade
 - d) up-down

- 4) The maximum number of flip flop required for Mod-6 counter is _____.
 - a) four
 - b) three
 - c) two
 - d) six

- 5) A memory chip has 10-bit address lines then its memory capacity is _____.
 - a) 4 KB
 - b) 2 KB
 - c) 1 KB
 - d) 6 KB

- 6) _____ type ADC has a very less conversion time.
 - a) Dual slope
 - b) Counter
 - c) SAR
 - d) Flash

- Q.2 Answer the following. (Any Three) 06**
- a) Define Multiplexer and De-Multiplexer circuits.
 - b) Give the four types shift register.
 - c) Give the difference between RAM and ROM.
 - d) Define accuracy and resolution of the digital to analog converter.
 - e) Draw the logic diagram of 4:1 multiplexer.
- Q.3 Answer the following questions. (Any Two) 06**
- a) Calculate the analog output for 4-bit binary weighted DAC, if 0 = 0 volt and 1 = 5volt for digital data 1100.
 - b) With suitable diagram explain in brief action of **D** flip-flop.
 - c) What is counter? Define asynchronous and synchronous counter.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Compare combinational and sequential circuit.
 - b) Write truth table and draw the timing diagram of decade counter.
 - c) With suitable diagram explain Flash type ADC.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain three-bit asynchronous counter.
 - b) What is encoder? What are its types? Explain in brief Octal to Binary encoder.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
MICROBIOLOGY - III
Microbial Macromolecules and Physiology (G04-DSC1-0311)**

Day & Date: Monday, 06-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw net diagram wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Choose correct alternative.**06**

- 1) In bacterial growth curve, the phase where cells are metabolically active but not dividing is _____.
a) Lag phase b) Log phase
c) Stationary phase d) Death phase
- 2) The protein part of an enzyme without cofactors is called as _____.
a) Holoenzyme b) Apoenzyme
c) Coenzyme d) Prosthetic group
- 3) The time required for a bacterial population to double is called as _____.
a) Growth rate b) Lag time
c) Generation time d) Stationary phase
- 4) Turbidity measurement of a culture is used to determine _____.
a) Cell mass b) Cell activity
c) Cell shape d) Cell number by DMC
- 5) Which of the following is the genetic material in most organisms?
a) Protein b) Lipid
c) DNA d) Carbohydrate
- 6) The major storage form of lipids in microbes is _____.
a) Steroids b) Triglycerides
c) Glycolipids d) Phospholipids

Q.2 Answer the following. (Any Three)**06**

- a) Define Lipids and give one example of it.
- b) Define Active Site.
- c) Write two functions of proteins in living organisms.
- d) Define Continuous growth.
- e) Enlist any one name of antibiotic acting on Cell wall.

- Q.3 Answer the following. (Any Two) 06**
- a) Describe secondary structure of proteins with diagrams.
 - b) Write in short Effect of pH on bacterial growth.
 - c) Write in short Induced Fit hypothesis of enzyme action.
- Q.4 Answer the following. (Any Two) 06**
- a) Differentiate between extracellular and intracellular enzymes with their examples.
 - b) Write a note on synchronous growth.
 - c) Write in short the effect of Oxygen on bacterial growth.
- Q.5 Answer the following. (Any One) 06**
- a) Describe in detail bacterial growth phases with a neat diagram.
 - b) Explain in detail the Watson and Crick model of DNA.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
GEOGRAPHY - III
Climatology - I (G04-DSC1-0313)**

Day & Date: Monday, 06-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Choose correct alternative.

06

- 1) Climatology is a branch of ____ Geography.
 - a) Human
 - b) Cultural
 - c) Physical
 - d) Soil
- 2) ____ is an element of Climate.
 - a) Air Pressure
 - b) Loo
 - c) Cyclone
 - d) Tornado
- 3) Ozone layer of the atmosphere absorb _____.
 - a) Gama rays
 - b) U.V. rays
 - c) Infra-red rays
 - d) X- rays
- 4) ____ factor that determines the amount of insolation received at a location.
 - a) Humidity
 - b) Altitude
 - c) Angle inclination of sunrays
 - d) Distance from a river
- 5) The sun is directly overhead at noon on 21st June at _____.
 - a) 90° N
 - b) 23.5° N
 - c) 23.5° S
 - d) 66.5° N
- 6) Nitrogen gas is found in ____ % quantity in the atmosphere.
 - a) 20.93
 - b) 0.03
 - c) 78.08
 - d) 0.3

Q.2 Answer the following. (Any Three)

06

- a) Define the concept of tropopause.
- b) Define the concept of Climatology.
- c) Define the concept of atmosphere.
- d) Define the concept of temperature.
- e) Define the concept of heat budget.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the difference between climate and weather.
 - b) Importance of Climatology.
 - c) Explain the factor affecting on distribution of temperature.
- Q.4 Answer the following (Any Two) 06**
- a) Explain the composition of the atmosphere.
 - b) Explain the scope of Climatology.
 - c) Explain the temperature inversion.
- Q.5 Answer the following (Any One) 06**
- a) Explain the structure of the atmosphere.
 - b) Explain the heat budget.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026**

COMPUTER SCIENCE - III

Introduction to Data Structures and Applications (G04-DSC1-0315)

Day & Date: Monday, 06-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.

Q.1 Choose correct alternative. 06

- 1) Which of the following is not a linear data structure?

a) Queue	b) Stack
c) Graph	d) Array

- 2) Stack is best suitable for _____.

a) Recursion	b) Sorting
c) Searching	d) Storing records

- 3) Binary search requires _____.

a) Random data	b) Sorted data
c) Tree data structure	d) Hash table

- 4) Which application uses linked list?

a) Polynomial manipulation	b) Binary search
c) Merge sort	d) Radix sort

- 5) DFS uses which data structure?

a) Tree	b) Queue
c) Priority Queue	d) Stack

- 6) A graph in which all vertices have equal degree is called _____.

a) Complete graph	b) Multigraph
c) Regular graph	d) Complementary graph

Q.2 Answer the following. (Any Three) 06

- a) Define Data structure.
- b) What is DQueue?
- c) What is searching?
- d) What is ADT?
- e) What is graph?

- Q.3 Answer the following. (Any Two) 06**
- a) Explain Minimum spanning tree.
 - b) Difference between Stack and Queue.
 - c) Explain types of linked List.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain operations available in queue Data Structure.
 - b) Write a program which implement Bubble Sort.
 - c) Explain BST with example.
- Q.5 Answer the following. (Any One) 06**
- a) Define following terms related to Graph
 - i) Graph
 - ii) Vertex
 - iii) Edges
 - iv) Cycle
 - v) Weighted graph
 - vi) Degree
 - b) Write a program to implement stack operation.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
GEOLOGY - III
Igneous Petrology (G04-DSC1-0317)**

Day & Date: Monday, 06-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:**
- 1) All questions are compulsory.
 - 2) Draw neat and labelled diagram and give equations wherever necessary.
 - 3) Figures to the right indicate full marks.
 - 4) Use of logarithmic table and non-programmable calculator is allowed.

Q.1 Select the most correct alternative from among those given below: 06

- 1) Rock is defined as _____.
 - a) Naturally occurring aggregate of minerals
 - b) Mixture of gases and liquids
 - c) Solidified organic matter
 - d) Man-made concrete

- 2) Granite is _____ igneous rock.

a) Volcanic	b) Plutonic
c) Hypabyssal	d) Extrusive

- 3) The igneous rock with glassy texture is _____.

a) Gabbro	b) Pumice
c) Obsidian	d) Pegmatite

- 4) The mutual arrangement of crystals and glass in igneous rocks is called _____.

a) Structure	b) Fabric
c) Texture	d) Pattern

- 5) Which process involves separation of liquid and crystals by pressure?

a) Filtration	b) Gravitational settling
c) Liquid immiscibility	d) Volatilization

- 6) In Bowen's discontinuous series, which mineral crystallizes first?

a) Biotite	b) Amphibole
c) Olivine	d) Quartz

- Q.2 Answer the following. (Any Three) 06**
- a) Define Eutectic point.
 - b) Give difference between lava and magma.
 - c) What is isotherm?
 - d) Define Porphyritic texture.
 - e) Define the batholith.
- Q.3 Answer the following. (Any Two) 06**
- a) Describe Vesicular and amygdaloidal structure.
 - b) Describe columnar joints.
 - c) Describe hypabyssal igneous rock with suitable example.
- Q.4 Answer the following. (Any Two) 06**
- a) Describe the differentiation of magma any two process.
 - b) Explain Intergrowth texture with neat labelled diagram.
 - c) Describe Assimilation of magma.
- Q.5 Answer the following (Any One) 06**
- a) Explain crystallization of unicomponent magma.
 - b) Classification of Igneous rocks based on mode of occurrence.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
 March/April – 2026
 MATHEMATICS - III
 Differential Calculus (G04-DSC1-0319)**

Day & Date: Monday, 06-04-2026
 Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
 2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative. 06

- 1) The intrinsic formula for radius of Curvature is _____.

a) $\rho = \frac{dy}{dx}$	b) $\rho = \frac{ds}{d\Psi}$
c) $\rho = \frac{1}{\rho} \cdot \frac{ds}{d\Psi}$	d) $\rho = \frac{dx}{dy}$

- 2) The radius of Curvature of the curve $p^2 = ar$ is _____.

a) $\frac{p^2}{a^2}$	b) $\frac{2p}{a^2}$
c) $\frac{2p^3}{a^2}$	d) $\frac{a^2}{p^2}$

- 3) If $x = r \cos \theta$ and $y = r \sin \theta$ then $\frac{\partial(r,\theta)}{\partial(x,y)} =$ _____.

a) x	b) y
c) r	d) $1/r$

- 4) If $u = x^2$ and $v = y^2$ then $\frac{\partial(u,v)}{\partial(x,y)} =$ _____.

a) $4xy$	b) $3xy$
c) $\frac{1}{xy}$	d) $\frac{x}{y}$

- 5) The Maximum Value of $\sin x + \cos x$ is _____.

a) 2	b) $\sqrt{2}$
c) 1	d) $\sqrt{3}$

- 6) A function $f(x)$ has minimum value at $x = c$ if _____.

a) $f'(c) = 0$ and $f''(c) > 0$	b) $f'(c) = 0$ and $f''(c) = 0$
c) $f'(c) = 0$ and $f''(c) < 0$	d) None of these

- Q.2 Answer the following questions. (Any Three) 06**
- Define Radius of Curvature.
 - Define Jacobian $J(u, v)$.
 - Define Maxima and Minima of function single variable.
 - Define Maxima and Minima of function two variables.
 - Find radius of Curvature at any point for $s = c \log(\sec \varphi)$
- Q.3 Answer the following questions. (Any Two) 06**
- Explain length of arc as a function.
 - If $u = x^2 - y^2$ and $v = x \cdot y$ then find $\frac{\partial(u,v)}{\partial(x,y)}$
 - Explain Necessary and Sufficient Condition for extreme values (statement only).
- Q.4 Answer the following questions. (Any Two) 06**
- Find radius of Curvature for the curve $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
 - Find the extreme values of $5x^6 + 18x^5 + 15x^4 - 10$
 - If $x = r \cos \theta$ and $y = r \sin \theta$ then find $\frac{\partial(x,y)}{\partial(r,\theta)}$
- Q.5 Answer the following question. (Any One) 06**
- Find the radius of Curvature for Cartesian equation of the curve $y = f(x)$
 - If $x = e^u \cdot \cos v$ and $y = e^u \cdot \sin v$ than show that $\frac{\partial(x,y)}{\partial(u,v)} \cdot \frac{\partial(u,v)}{\partial(x,y)} = 1$

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
STATISTICS - III
Discrete Probability Distributions (G04-DSC1-0321)**

Day & Date: Monday, 06-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the following. 06

- 1) If $E(X) = 5$ and $Var(X) = 5$, then $E(X + 6)$ and $Var(X + 6)$ are equal to _____.

a) 5, 4	b) 6, 6
c) 11, 5	d) 11, 10
- 2) A r. v. $X \sim B(n, p)$ distribution, then mean and variance of X are _____.

a) np, npq	b) p, q
c) np and np^2	d) None of these
- 3) If $X =$ number of candidates required to interview for the post of an officer, then X follows _____.

a) Binomial distribution	b) Bernoulli distribution
c) Geometric distribution	d) Poisson distribution
- 4) The second central moment of Poisson distribution with mean m is _____.

a) m	b) $3m$
c) m^2	d) m^3
- 5) If $X \sim NBD(k, p)$, then _____.

a) $E(X) < Var(X)$	b) $E(X) > Var(X)$
c) $E(X) = Var(X)$	d) $E(X) < SD(X)$
- 6) If X follows discrete uniform distribution on $0, 1, 2, \dots, n$ and the mean of X is 6, then the value of n is _____.

a) 6	b) 18
c) 36	d) 12

Q.2 Answer the following. (Any Three) 06

- a) Define mathematical expectation of a univariate discrete r. v. X .
- b) Define Hypergeometric distribution.
- c) Write definition of probability generating function (p. g. f).
- d) Write definition of Bernoulli distribution.
- e) Give any two real life situations of Geometric distribution.

Q.3 Answer the following. (Any Two)

06

- a) Suppose X and Y are two discrete r. v. with joint probability distribution.

$\{(x_i, y_j, p_{ij}); i = 1, 2, \dots, m; j = 1, 2, \dots, n\}$, then prove that

$$E(X + Y) = E(X) + E(Y)$$

- b) Find p.g.f. of Poisson distribution with parameter m .
- c) Let X be a discrete r.v. with following p.m.f.

X	0	1	2	3
$P(X)$	0.1	0.3	0.4	0.2

Find $E(X)$ and $Var(X)$

Q.4 Answer the following. (Any Two)

06

- a) Suppose X and Y are two discrete r.v.s. then, show that $Var(aX + bY) = a^2 Var(X) + b^2 Var(Y) + 2ab Cov(X, Y)$ where a and b are real constants.
- b) State and prove additive property of Negative Binomial distribution.
- c) Define conditional expectation and conditional variance of $X/Y = y$ for a bivariate r.v. (X, Y) .

Q.5 Answer the following. (Any One)

06

- a) Define discrete uniform distribution and also obtain its mean and variance.
- b) Find P.G.F. of NB (k, p) distribution.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
ENVIRONMENTAL SCIENCE – III
Fundamentals of Environmental Biology (G04-DSC1-0323)**

Day & Date: Monday, 06-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.

Q.1 Choose correct alternative.

06

- 1) Halophytes are the plants that: _____.
 - a) Are registrant to fire
 - b) Grow in saline soil
 - c) Are registrant to cold
 - d) Prefer dry sandy soil

- 2) Taxonomy is the science of _____.
 - a) Naming and classification of organism
 - b) Studding DNA sequences
 - c) Ecological interaction
 - d) Evolution of the study

- 3) Which Taxonomic rank come bellow kingdom and above class in animal?
 - a) Family
 - b) Genus
 - c) Phylum
 - d) Order

- 4) A Hydrophyte is _____.
 - a) A desert plant
 - b) An aquatic plant
 - c) A plant growing in saline soil
 - d) A terrestrial Plant

- 5) The Biological species concept says organisms are part of the same species if they _____.
 - a) Breed
 - b) Look the same
 - c) Can produce offspring than can also breed
 - d) Look the same and act the same

- 6) The Taxonomic aid which is collection of dried plant specimens is called _____.
 - a) Botanical Garden
 - b) Herbarium
 - c) Zoological Park
 - d) Museum

- Q.2 Answer the following. (Any Three) 06**
- a) Define Hydrophytes with suitable examples.
 - b) Write a note on Invasive species.
 - c) Define species Habitats.
 - d) Explain the types of species.
 - e) Define Xerophytes with suitable examples.
- Q.3 Answer the following. (Any Two) 06**
- a) Explain Bio-resources concept with suitable examples.
 - b) Explain Charles Darwin's Voyage of HMS Beagle Theory.
 - c) Explain causes for Loss of Biodiversity.
- Q.4 Answer the following (Any Two) 06**
- a) Describe Geological Continental Drift theory.
 - b) Explain major food plants in India.
 - c) Explain methods of extractions of Bio-resources.
- Q.5 Answer the following (Any One) 06**
- a) Explain theories of origin of Life.
 - b) Write in details on Bio-resources and their significance for sustainability.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
PHYSICS - IV
Electronic Devices and Applications (G04-DSC1-0302)**

Day & Date: Tuesday, 07-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative (MCQ) 06

- 1) The voltage gain of an amplifier with negative feedback is _____.
 - a) increased
 - b) decreased
 - c) not affected
 - d) None of the above
- 2) Barkhausen criterion is used for _____.
 - a) Amplification
 - b) Oscillation
 - c) Filtering
 - d) Attenuation
- 3) In FET, the current is controlled by _____.
 - a) Base voltage
 - b) Collector current
 - c) Gate voltage
 - d) Emitter resistance
- 4) A Colpitts oscillator uses _____.
 - a) Resistors only
 - b) Two inductors
 - c) Two capacitors and one inductor
 - d) One capacitor and one inductor
- 5) The device used to generate a voltage sweep is _____.
 - a) BJT
 - b) UJT
 - c) FET
 - d) CRO
- 6) CRO can be used to measure _____.
 - a) Temperature
 - b) Pressure
 - c) Voltage and frequency
 - d) Electric field

Q.2 Answer the following questions. (Any Three) 06

- a) Draw and explain the frequency response of a two-stage RC coupled amplifier.
- b) State Barkhausen criterion.
- c) What is the application of UJT as a voltage sweep generator?

- d) Calculate the intrinsic stand-off ratio (Γ) of a Unijunction transistor when $R_{B1}=10k\Omega$ and $R_{B2}=15k\Omega$.
- e) Write any two uses of CRO.

Q.3 Answer the following questions. (Any Two) 06

- a) Calculate the oscillation frequency for Hartley oscillator circuit. Given values $L_1=750 \mu H, L_2=750 \mu H, M = 75 \mu H$ and $C = 150 pF$.
- b) Describe the working and characteristics of FET.
- c) Compare normal amplifier and differential amplifier.

Q.4 Answer the following questions. (Any Two) 06

- a) Describe the construction and working of a cathode ray oscilloscope (CRO).
- b) Explain transistor series voltage regulator with a neat circuit diagram.
- c) Describe Phase shift oscillator with circuit diagram and working.

Q.5 Answer the following question. (Any One) 06

- a) With a neat diagram, explain voltage divider bias and derive the expression for stability factor.
- b) Explain Colpitts oscillator in detail with circuit diagram and derive the formula for its frequency of oscillation.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
CHEMISTRY - IV
Inorganic Chemistry (G04-DSC1-0304)**

Day & Date: Tuesday, 07-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat labelled diagram and give equations wherever necessary.
4) At. Wts : H = 1, C = 12, O = 16, Na = 23, Cl = 35.5

Q.1 Choose the correct alternative from the options. (MCQ)**06**

- 1) Coordinate bond is _____ bond.
 - a) weak
 - b) double
 - c) semipolar
 - d) van der Waal's
- 2) While naming bromide as a ligand, its name is changed to _____.
 - a) bromo
 - b) bromide
 - c) bromine
 - d) bromated
- 3) The chelating agents must have at least _____ donor groups.
 - a) 2
 - b) 4
 - c) 0
 - d) less than 2
- 4) _____ element belongs to second transition series.
 - a) U
 - b) Mo
 - c) W
 - d) Hf
- 5) The first transition elements show _____ stable oxidation states.
 - a) +2 and +3
 - b) +1 and +2
 - c) +3 and +4
 - d) +6 and +7
- 6) The ligand which forms metal chelate with metal ion is termed as _____ agent.
 - a) complexing
 - b) chelating
 - c) oxidizing
 - d) reducing

- Q.2 Answer the following questions. (Any Three) 06**
- a) Define the terms -
 - i) Complexing agents
 - ii) Chelation
 - b) Why d-block elements are called transition elements.
 - c) Give the general electronic configuration of 3d and 4d transition series elements.
 - d) Define primary valency and secondary valency.
 - e) Show the cis-trans isomers in $[\text{Co}(\text{NH}_3)_2\text{Cl}_2]$.
- Q.3 Answer the following questions. (Any Two) 06**
- a) Why transition elements show colour.
 - b) What are the basic structural requirements for stability of metal chelate?
 - c) Explain Effective Atomic Number with suitable example.
- Q.4 Answer the following questions. (Any Two) 06**
- a) On the basis of VBT, explain the formation of $[\text{CuCl}_4]^{-2}$ complex ion.
 - b) Explain catalytic behavior of transition elements.
 - c) Explain postulates of Werner's theory.
- Q.5 Answer the following question. (Any One) 06**
- a) Give name, atomic symbol and electronic configuration of 5d transition elements.
 - b) Explain Werner's theory with respect to $\text{CoCl}_3 \cdot 4\text{NH}_3$ and $\text{CoCl}_3 \cdot 3\text{NH}_3$ complexes.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
BOTANY - IV
Plant Metabolism (G04-DSC1-0306)**

Day & Date: Tuesday, 07-04-2026
Time: 9:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative.**06**

- 1) The element _____ is micronutrient.

a) Fe	b) N
c) P	d) K

- 2) Enzymes are _____.

a) Hormone	b) protein that acts as catalysts
c) Lipids	d) Carbohydrates

- 3) The plant hormone _____ is commonly used for artificial ripening of fruit.

a) Auxin	b) Cytokinin
c) Gibberellin	d) Ethylene

- 4) Biological nitrogen fixation is mainly divided into _____ types.

a) 4	b) 3
c) 2	d) 6

- 5) _____ is a monosaccharide.

a) Sucrose	b) Lactose
c) Glucose	d) None of these

- 6) ABA primarily act as _____.

a) Growth promoter	b) Ripening agent
c) Growth Inhibitor	d) Flowering Hormone

Q.2 Answer the following questions. (Any Three)**06**

- a) Define macronutrient with example.
- b) Define growth regulators.
- c) What is polysaccharides.
- d) Define biological nitrogen fixation.
- e) Enlist the classes of enzyme.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain the deficiency of potassium in plant.
 - b) Sketch and label nitrogen cycle.
 - c) State the physiological role of Gibberellin.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain the general characteristics of enzyme.
 - b) Write the properties of polysaccharides.
 - c) Give the significance of biological nitrogen fixation.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain the role and deficiency symptoms of nitrogen.
 - b) Explain the properties and example of disaccharides.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
ZOOLOGY - IV
Fundamentals of Biochemistry (G04-DSC1-0308)**

Day & Date: Tuesday, 07-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative. (MCQ) 06

- 1) _____ is a process which removes carbon dioxide from the atmosphere.
 - a) Combustion
 - b) Decomposition
 - c) Photosynthesis
 - d) Volcanic eruption

- 2) The process of converting nitrogen gas into ammonia is called _____.
 - a) Nitrification
 - b) Nitrogen fixation
 - c) Denitrification
 - d) Ammonification

- 3) _____ of the following is a monosaccharide.
 - a) Sucrose
 - b) Lactose
 - c) Glucose
 - d) Maltose

- 4) _____ are the building blocks of protein.
 - a) Carbohydrates
 - b) Amino acids
 - c) Lipids
 - d) Nucleic acids

- 5) _____ is essential for blood clotting.
 - a) Vitamin A
 - b) Vitamin D
 - c) Vitamin E
 - d) Vitamin K

- 6) _____ are that increase the rate of a chemical reaction in living organisms without change the reaction.
 - a) Enzymes
 - b) Vitamins
 - c) Minerals
 - d) Nucleic acids

Q.2 Answer the following questions. (Any Three) 06

- a) What are the biological importances of Oxygen?
- b) Define Monosaccharides.
- c) What are the functions of mRNA?
- d) Define the term enzyme.
- e) What is the composition of Nucleotide?

- Q.3 Answer the following questions. (Any Two) 06**
- a) Write a note on Nitrogen.
 - b) What is the phospholipid? Give its significances.
 - c) Write a note on amino acids.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Describe the primary structure of protein.
 - b) What are the different types of DNA.
 - c) Describe the structure of lipids.
- Q.5 Answer the following question. (Any One) 06**
- a) Describe the term conjugate protein with suitable examples.
 - b) Which are the factors affecting the mechanism of enzyme action.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
ELECTRONICS - IV
Semiconductor Devices (G04-DSC1-0310)**

Day & Date: Tuesday, 07-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative. (MCQ) 06

- 1) _____ material acts as Conductor only when temperature of material increases.

a) Silicon	b) Copper
c) Aluminum	d) Silver

- 2) _____ semiconductor is pure semiconductor without doping impurity.

a) Intrinsic	b) Extrinsic
c) N-type	d) P-type

- 3) The potential barrier of a Germanium P-N junction Diode is approximately _____.

a) 0.3 V	b) 0.7 V
c) 1.1 V	d) 2.2 V

- 4) In Forward bias, the current is mainly due to _____.

a) Majority carriers	b) Minority carriers
c) Both equally	d) Electrons only

- 5) The three terminals of MOSFET are _____.

a) Source, Drain, Gate	b) Anode, Cathode, Gate
c) Emitter, Base, Collector	d) Source, Base, Collector

- 6) Red, Yellow, Green Colour of LED depends on _____.

a) Voltage applied	b) Doping Material
c) Shape of LED	d) Current limiting Resistor

Q.2 Answer the following questions. (Any Three) 06

- a) Define Extrinsic semiconductor.
- b) Differentiate between N-type and P-type semiconductors.
- c) What is junction capacitance?
- d) What is Inversion layer in MOSFET?
- e) What is PIV of Diode?

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain P-type semiconductor with the help of doping process.
 - b) Explain forward biasing of a P-N junction diode with characteristics.
 - c) Explain the breakdown mechanism of a Zener diode.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Compare BJT and FET (any three points).
 - b) Explain the working of Enhancement type MOSFET with circuit diagram.
 - c) In transistor circuit, if $I_c = 92 \text{ mA}$, $I_E = 100 \text{ mA}$ then find α & β of transistor.
- Q.5 Answer the following question. (Any One) 06**
- a) Draw and explain the construction of N-Channel JFET. What is factor of JFET?
 - b) Explain the working of Bridge rectifier with circuit diagram. Derive its Ripple factor.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
MICROBIOLOGY - IV
Microbial Genetics (G04-DSC1-0312)**

Day & Date: Tuesday, 07-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.
3) Draw neat labeled diagrams wherever necessary.

Q.1 Choose correct alternative and alternative and rewrite the sentence again. 06

- 1) DNA replication occurs by _____ replicative mode.
 - a) Conservative
 - b) Semi-conservative
 - c) Dispersive
 - d) Fragmentation
- 2) The minimal genetic unit responsible for recombination is called as _____.
 - a) Muton
 - b) Cistron
 - c) Recon
 - d) Split genes
- 3) Z form of DNA consists _____ base pairs.
 - a) 10
 - b) 12
 - c) 9
 - d) 8
- 4) _____ is base analogue of Thymine.
 - a) 2 Amino purine
 - b) 5-Bromo uracil
 - c) Nitrous acid
 - d) Proflavin
- 5) A base pair substitution mutation in which a codon specifying for one amino acid is substituted by another codon which specify functionally different amino acid is called as _____ mutation.
 - a) Non sense
 - b) Missense
 - c) Silent
 - d) Neutral
- 6) The unwinding of DNA during replication is carried out by _____ enzyme.
 - a) DNA Primase
 - b) DNA gyrase
 - c) DNA Ligase
 - d) DNA Helicase

Q.2 Define the following. (Any Three) 06

- a) Define gene.
- b) Define transition and transversion.
- c) What is DNA repair?
- d) Define nucleotide.
- e) Define genotype and phenotype

- Q.3 Write Short notes. (Any Two)** **06**
- a) Give a detailed account on properties of genetic code.
 - b) Discuss in brief base excision repair mechanism.
 - c) Describe in brief activation of amino acids during translation in prokaryotes.
- Q.4 Answer the following. (Any Two)** **06**
- a) Describe in brief Watson crick model of DNA.
 - b) Describe in brief Griffith experiment.
 - c) Give a detailed account on inducible mutation caused by UV radiation and alkylating agent.
- Q.5 Answer the following. (Any One)** **06**
- a) Enlist enzymes involved in DNA replication. Discuss in detail Mechanism of DNA replication.
 - b) Explain in detail transcription process in prokaryotes.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
GEOGRAPHY - IV
Climatology - II (G04-DSC1-0314)**

Day & Date: Tuesday, 07-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to right indicate full marks.
3) Draw neat diagrams wherever necessary.

Q.1 Choose correct alternative:**06**

- 1) Humidity is measured by _____.
 - a) Meter
 - b) Hygrometer
 - c) Kilometer
 - d) Humidity meter
- 2) The snow changing into water vapor in the air this process is known as _____.
 - a) Sublimation
 - b) Evaporation
 - c) Condensation
 - d) Melting
- 3) Cirrus is a type of _____.
 - a) Air mass
 - b) Cyclone
 - c) Humidity
 - d) Clouds
- 4) _____ is a type of Rainfall.
 - a) Orographic
 - b) Conventional
 - c) Cyclonic
 - d) All the above
- 5) Evaporation is a process by which water is transformed from liquid to _____ state.
 - a) Snow
 - b) Liquid
 - c) Solid
 - d) Gas
- 6) _____ term is used for a tropical cyclone in the India and Indian Ocean.
 - a) Tornado
 - b) Typhoon
 - c) Hurricane
 - d) Cyclone

Q.2 Answer the following. (Any Three)**06**

- a) Define the concept of relative humidity.
- b) Define the concept of latent heat.
- c) Define the concept of cyclone.
- d) Define the fronts.
- e) Define the concept of fog.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the characteristics of cyclone.
 - b) Explain the types of air masses.
 - c) Explain the types of rainfall.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain the impact of tornado.
 - b) Explain the classification of tropical cyclone.
 - c) Explain the absolute humidity.
- Q.5 Answer the following. (Any One) 06**
- a) Explain the different types of clouds.
 - b) Explain sources of the atmospheric moisture.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
COMPUTER SCIENCE - IV
Fundamentals of Database Systems with SQL and PL/SQL
(G04-DSC1-0316)**

Day & Date: Tuesday, 07-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative.

06

- 1) The collection of information stored in the database at a particular moment is called _____.
 - a) schema
 - b) Instance
 - c) subschema
 - d) None of these

- 2) The process of minimizing the differences between entities by identifying their common characteristics is known as _____.
 - a) Specialization
 - b) Generalization
 - c) Multiplicity
 - d) None of the above

- 3) Which SQL keyword is used to sort the data returned by a SELECT statement?
 - a) Order By
 - b) Group By
 - c) Group
 - d) None of these

- 4) Exception handling can be performed under which of the following PL/SQL program block?
 - a) DECLARE
 - b) BEGIN
 - c) EXCEPTION
 - d) END

- 5) A phase during which all locks are requested is known as a _____.
 - a) Growing phase
 - b) Shrinking phase
 - c) Aborted phase
 - d) None of the above

- 6) Which of the following is not included in DML (Data Manipulation Language)?
 - a) UPDATE
 - b) CREATE
 - c) INSERT
 - d) DELETE

- Q.2 Answer the following. (Any Three) 06**
- a) Define the terms:
 - i) Domain
 - ii) Tuple
 - b) List the states of Transaction.
 - c) What is dirty read problem?
 - d) What is Procedure?
 - e) List out Aggregate functions.
- Q.3 Answer the following. (Any Two) 06**
- a) Explain 2 tier and 3 tier architecture.
 - b) Write note on Specialization.
 - c) What is Cursor? Explain with example.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain Alter command with example.
 - b) Write short note on Primary key and Foreign key.
 - c) Write a PL/SQL block to check given number is odd or even.
- Q.5 Answer the following (Any One) 06**
- a) What is Transaction? Explain ACID properties.
 - b) What is Trigger? Explain with example.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
GEOLOGY - IV
Sedimentary Petrology (G04-DSC1-0318)**

Day & Date: Tuesday, 07-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw net diagram wherever necessary.
3) Figures to the right indicates full marks.

Q.1 Select correct one.

06

- 1) Conglomerate is a _____ sedimentary rock
 - a) Argillaceous
 - b) Rudaceous
 - c) Arenaceous
 - d) Silt
- 2) Sandstone contains _____.
 - a) Sand
 - b) Boulder
 - c) Cobble
 - d) Micaceous material
- 3) Limestone formed by precipitation of _____.
 - a) Calcium carbonate
 - b) Iron
 - c) Magnesium sulphate
 - d) Manganese sulphate
- 4) Sediments in arkoses are _____.
 - a) Quartz & feldspar
 - b) Quartz & mica
 - c) Quartz & Amphibole
 - d) Feldspar & mica
- 5) Compaction of sediments means _____.
 - a) Removal of water
 - b) Removal of cement
 - c) Addition of water
 - d) None of these
- 6) Mud cracks occur in _____ rock.
 - a) Rudaceous
 - b) Arenaceous
 - c) Argillaceous
 - d) Chemical

Q.2 Answer the following. (Any Three)

06

- a) Describe fossiliferous limestone.
- b) What is bedding?
- c) Gives the name of different grade of sediments.
- d) Define sedimentary rock.
- e) Name two rocks of residual deposits of sedimentary rock.

- Q.3 Write the following. (Any Two) 06**
- a) Explain Residual sedimentary rock.
 - b) What is lithification?
 - c) Describe Argillaceous rocks with varieties.
- Q.4 Answer the following. (Any Two) 06**
- a) Describe any two various types of sandstones.
 - b) Describe the Pisolitic texture.
 - c) Describe the chemical sedimentary rock.
- Q.5 Answer the following. (Any One) 06**
- a) Describe the process of formation of sedimentary rock.
 - b) Describe any three kinds of structures in sedimentary rock.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
MATHEMATICS - IV
Laplace Transform (G04-DSC1-0320)**

Day & Date: Tuesday, 07-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative. (MCQ)**06**

- 1) If $L\{F(t)\} = f(p)$ then $L\{F'(t)\} =$ _____.
- a) $f(p) - PF(0)$ b) $Pf(p) - F(0)$
c) $Pf(p) + F(0)$ d) $f(p) + PF(0)$
- 2) $L\{t^3 e^{-3t}\} =$ _____.
- a) $\frac{1}{(P+3)^4}$ b) $\frac{2}{(P+3)^4}$
c) $\frac{6}{(P+3)^4}$ d) $\frac{6}{(P-3)^4}$
- 3) Find $L^{-1}\left\{\frac{4}{P-2}\right\} =$ _____.
- a) $2 e^{2t}$ b) $5 e^{-2t}$
c) e^{2t} d) $4 e^{2t}$
- 4) $1 * 1 * 1 * 1 * \dots * 1(n \text{ times}) =$ _____.
- a) $\frac{t^{n-1}}{(n-1)!}$ b) $\frac{t^{n-1}}{n!}$
c) $\frac{t^n}{n!}$ d) $\frac{t^{n+1}}{(n+1)!}$
- 5) $L\{\sin t \cdot \cos t\} =$ _____.
- a) $\frac{1}{P^2 + 4}$ b) $\frac{2}{P^2 + 4}$
c) $\frac{P}{P^2 + 4}$ d) $\frac{4}{P^2 - 4}$
- 6) If $y(x, t)$ is a function of x and t then $L\left\{\frac{\partial y}{\partial t}\right\} =$ _____.
- a) $\bar{y}(x, p) - y(x, 0)$ b) $p\bar{y}(x, p) - y(x, 0)$
c) $\bar{y}(x, p) + y(x, 0)$ d) $py(x, 0) + y(x, 0)$

Q.2 Answer the following questions. (Any Three) 06

- Evaluate $L^{-1}\left\{\frac{1}{(p+a)^n}\right\}$
- Evaluate $L^{-1}\left\{\frac{3p-2}{p^2-4p+20}\right\}$
- Find $L\{e^t \sin^2 t\}$
- Find $L\{\cosh^2 2t\}$
- Solve $\frac{d^2y}{dt^2} + y = 0$ under the condition that $y = 1, \frac{dy}{dt} = 0$ when $t = 0$

Q.3 Answer the following questions. (Any Two) 06

- If $L\{F(t)\} = f(p)$ then prove that $L\{F(at)\} = \frac{1}{a}f\left(\frac{p}{a}\right)$
- Find $L^{-1}\left\{\log\left(1 + \frac{1}{p^2}\right)\right\}$
- Solve $(D^2 + 9)y = \cos 2t$ if
 $y(0) = 1, y\left(\frac{\pi}{2}\right) = -1$

Q.4 Answer the following questions. (Any Two) 06

- Using Heaviside's expansion formula find $L^{-1}\left\{\frac{3p+1}{(p-1)(p^2+1)}\right\}$
- Find Laplace transform of the function $F(t)$ where

$$F(t) = \begin{cases} \int_0^{\sin t} & , 0 < t < \pi \\ & , t > \pi \end{cases}$$
- If $F(t)$ is a function of class A and if $L\{F(t)\} = f(p)$ then prove that
 $L\{tF(t)\} = -f'(p)$

Q.5 Answer the following question. (Any One) 06

- State and prove convolution theorem.
- Solve $ty'' + y' + 4ty = 0$ if $y(0) = 3, y'(0) = 0$
 - Show that

$$\int_0^{\infty} te^{-3t} \sin t dt = \frac{3}{50}$$

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
PHYSICS - III
Thermal Physics and Sound (G04-DSC2-0301)**

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative. (MCQ) 06

- 1) All natural processes are _____ processes.
 - a) Isothermal
 - b) Reversible
 - c) Adiabatic
 - d) Irreversible
- 2) In an isothermal process change in internal energy _____.
 - a) increases
 - b) decreases
 - c) remains constant
 - d) zero
- 3) Entropy is maximum in _____ state.
 - a) Gas
 - b) Solid
 - c) Liquid
 - d) Both b and c
- 4) Microphone Convert sound energy into _____ energy.
 - a) Sound
 - b) Electrical
 - c) Thermal
 - d) None of these
- 5) A normal conversation between people is typically around _____.
 - a) 20 dB
 - b) 60 dB
 - c) 100 dB
 - d) 120 dB
- 6) For making the hall acoustically good, the reverberation time must be _____.
 - a) Optimum
 - b) Large
 - c) Zero
 - d) Small

Q.2 Answer the following questions. (Any Three) 06

- a) State Zeroth law of thermodynamics.
- b) Define Entropy.
- c) Define Transducers.
- d) Define Reverberation time.
- e) Define the units Bel and Decibel.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Write a note on reversible processes.
 - b) Discuss the physical significance of entropy.
 - c) Write a note on pressure microphone.
- Q.4 Answer the following questions. (Any Two) 06**
- a) State acoustics of a hall and explain the requirements of good acoustics.
 - b) Draw and explain T-S diagram.
 - c) What is loudness of sound? How it measured?
- Q.5 Answer the following question. (Any One) 06**
- a) Derive an expression for the work done during isothermal and adiabatic processes with suitable diagrams.
 - b) Derive Sabine's formula for reverberation time.

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Set P

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026**

CHEMISTRY - III

General Physical Chemistry - I (G04-DSC2-0303) / (G04-DSC2-0335)

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagram and give equations wherever necessary.
3) Figures to the right indicate full marks.
4) Use of logarithmic table and calculator is allowed.
(At. Wt: H=1, C=12, O=16, N=14, Na=23, Ag=108, Cl=35.5)

Q.1 Choose correct alternative of the following and rewrite the sentences.

06

- The derivative of a constant term is always _____.
a) positive b) negative
c) zero d) constant
- Nernst distribution law is applicable when the two liquids are _____.
a) miscible in each other b) immiscible in each other
c) partly miscible d) volatile
- Weaker the acid, greater is the _____.
a) ionic product b) dissociation constant
c) hydrolysis constant d) degree of ionisation
- The values on x-axis are called _____.
a) abscissa b) ordinate
c) slope d) intercept
- In a cyclic process, where the initial and final states of the system are same, then _____.
a) $W = 0$ b) $q = 0$
c) $\Delta E = 1$ d) $\Delta E = 0$
- Strength of an acid depends upon _____.
a) the concentration of H^+ ions
b) the concentration of OH^- ions
c) the concentration of electrons
d) All of these

- Q.2 Answer the following questions. (Any Three) 06**
- a) Define graph and graph paper.
 - b) Define the Nernst distribution law.
 - c) What is hydrolysis?
 - d) Calculate % efficiency of heat engine operating between 400K and 300K.
 - e) Define pH. Give mathematical equation.
- Q.3 Answer the following questions. (Any Two) 06**
- a) What is buffer solution? Give Henderson equation for acidic buffer solutions.
 - b) Mention any three examples of spontaneous process.
 - c) Explain factors affecting degree of ionization.
- Q.4 Answer the following questions. (Any Two) 06**
- a) What are the limitations of distribution law?
 - b) Write any three rules of differentiation.
 - c) Distinguish between spontaneous and non-spontaneous processes.
- Q.5 Answer the following question. (Any One) 06**
- a) Define the term intercept. Discuss different forms of straight-line equations.
 - b) Discuss the modified distribution law when solute dissociated or associated in one of the solvent.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
General Chemistry - II
General Paint Chemistry (G04-DSC2-0334)**

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Multiple choice questions. 06

- 1) Which pigment is toxic and banned in many countries for safety reasons?
 - a) Zinc oxide
 - b) Lead chromate
 - c) Titanium dioxide
 - d) Hansa yellow
- 2) Which of the following pigments is known for its fluorescent properties?
 - a) Chrome green
 - b) Rubine toner
 - c) Fluorescent pigments
 - d) Iron oxide red
- 3) Which pigment is derived from phthalonitrile and is known for excellent stability?
 - a) Hansa yellow
 - b) Phthalocyanine blue
 - c) Toluidine red
 - d) Cadmium orange
- 4) Pigments are not based on _____.
 - a) Chemical composition
 - b) Color index
 - c) Particle size
 - d) Source (natural/synthetic)
- 5) Advantages of organic pigments over inorganic pigments include _____.
 - a) Brighter colors
 - b) Greater weather resistance
 - c) Low transparency
 - d) Greater solubility
- 6) High oil absorption in pigments indicates _____.
 - a) High binder demand
 - b) Better dispersion
 - c) Lower surface area
 - d) None of above

Q.2 Answer the following questions. (Any Three) 06

- a) Define chromium oxide and its typical use.
- b) What is the role of metallic pigments in coatings? Give examples.
- c) Define basic dye pigments and give one example.
- d) What are acid dye pigments? Where are they commonly used?
- e) Define white pigment and give two examples.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Mention two testing methods for identifying organic pigments.
 - b) List any four applications of miscellaneous pigments in industry.
 - c) Explain the classification and characteristics of the following pigment groups:
 - i) Hansa yellows
 - ii) Rubine and Para reds
 - iii) Toluidine pigments
- Q.4 Answer the following questions. (Any Two) 06**
- a) Write short on the following:
 - i) Toner pigments
 - ii) Para red pigments
 - b) Explain:
 - i) Fluorescent pigments
 - ii) Metallic effect pigments
 - iii) Testing of lightfastness
 - c) What is meant by lightfastness in pigment testing?
- Q.5 Answer the following question. (Any One) 06**
- a) What are treated pigments? Discuss how surface treatment improves pigment properties like dispersion, weather resistance, and chemical stability.
 - b) Explain the methods used for testing and identifying organic pigments, covering techniques like:
 - . Colour comparison
 - . Solubility test
 - . Chemical spot test
 - . Microscopy

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
BOTANY - III
Economic Botany (G04-DSC2-0305)**

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat labelled diagram whenever necessary.
3) Figures to the right indicate full marks.

Q.1 Multiple Choice Question.**06**

- 1) The _____ are the edible grains.

a) cereals	b) fibres
c) legumes	d) spices

- 2) Ground nut belongs to family _____.

a) Poaceae	b) Graminae
c) Fabaceae	d) Liliaceae

- 3) Vavilov proposed _____ centres of origin of crop plants.

a) 6	b) 8
c) 10	d) 12

- 4) The part used as drug of ginger plant is _____.

a) Seed	b) Leaf
c) Rhizome	d) Root

- 5) The cotton fibres are produced in _____.

a) cotton roots	b) cotton stem
c) cotton leaves	d) cotton balls

- 6) The chickpea is a _____ plant.

a) legume	b) fibre
c) spice	d) drug

Q.2 Answer the following questions. (Any Three)**06**

- a) Which part of coconut fruit gives coir?
- b) Enlist any two important spices with their botanical name.
- c) Write any two economic importance of Mehandi.
- d) Enlist the evolved new crop varieties.
- e) What is meant by germplasm?

- Q.3 Answer the following questions. (Any Two) 06**
- a) Write the morphology of clove.
 - b) Give economic importance of groundnut.
 - c) State the nutritive value of chick pea.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Give economic importance of cotton.
 - b) Write the cultivation method of Ginger.
 - c) Explain in brief Vavilov concept of center of origin of crop plants.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain in brief cultivation method and economic importance of jowar.
 - b) Give an account of products and byproducts of sugarcane industry.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
ZOOLOGY - III
Introduction to Genetics (G04-DSC2-0307)**

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat labelled diagrams wherever necessary.

Q.1 Choose correct alternative. (MCQ) 06

- 1) The process of transfer of characters from parents to offspring is referred to as _____.
 - a) Inheritance
 - b) Heritage
 - c) Genetics
 - d) Variation

- 2) _____ pairs of contrasting traits were studied by Mendel in pea plant.
 - a) 6
 - b) 7
 - c) 8
 - d) 10

- 3) Person having genotype IA IB would show the blood group as AB. This is because of _____.
 - a) pleiotropy
 - b) co-dominance
 - c) segregation
 - d) incomplete dominance

- 4) In _____ mode of inheritance, the F1 progeny exhibit characteristics of both the parents.
 - a) Complete dominance
 - b) Incomplete dominance
 - c) Codominance
 - d) Multiple allelism

- 5) The genetic disorders caused due to the presence of an additional copy of X- chromosome resulting into karyotype of 47 is _____.
 - a) Down's syndrome
 - b) Klinefelter's syndrome
 - c) Turner's syndrome
 - d) Thalassemia

- 6) _____ deserves the credit to discover Punnett square.
 - a) Reginald Punnett
 - b) Gregor Mendel
 - c) John Watson
 - d) Maurice Punnett

Q.2 Answer the following questions. (Any Three) 06

- a) Define Genotype and Phenotype.
- b) Explain Test cross with one example.
- c) Write importance of crossing over.

- d) Why Mendel selected pea plant for his work?
- e) Define Monohybrid and Dihybrid ratio.

Q.3 Answer the following questions. (Any Two) 06

- a) Define Multiple allele with any one example.
- b) Explain Turners syndrome.
- c) Explain Law of Independent Assortment with one example.

Q.4 Answer the following questions. (Any Two) 06

- a) Define Complete and Incomplete Linkage with suitable example.
- b) Explain complementary gene with example.
- c) Define Epistasis, enlist the different types with one example.

Q.5 Answer the following question. (Any One) 06

- a) Explain chromosomal mechanism of sex determination in Drosophila and Human.
- b) Explain mechanism of crossing over and write cytological proof of it.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
ELECTRONICS - III
Digital Techniques (G04-DSC2-0309)**

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative. (MCQ) 06

- 1) The output of an XOR gate is HIGH when _____.
 - a) Both inputs are HIGH
 - b) Both inputs are LOW
 - c) Inputs are different
 - d) Inputs are same
- 2) A 4-to-1 multiplexer requires _____ select lines.
 - a) 1
 - b) 2
 - c) 3
 - d) 4
- 3) An octal to binary encoder has _____.
 - a) 8 inputs and 3 outputs
 - b) 3 inputs and 8 outputs
 - c) 4 inputs and 3 outputs
 - d) 8 inputs and 4 outputs
- 4) JK flip-flop toggles when _____.
 - a) J=1, K=0
 - b) J=0, K=1
 - c) J=1, K=1
 - d) J=0, K=0
- 5) Left shift operation in shift register is _____ type.
 - a) SISO
 - b) SIPO
 - c) PISO
 - d) PIPO
- 6) The Johnson counter is also known as _____.
 - a) Twisted Ring Counter
 - b) Binary Counter
 - c) Gray Code Counter
 - d) Up Counter

Q.2 Answer the following questions. (Any Three) 06

- a) State the function of a magnitude comparator.
- b) Give IC number for BCD to 7-segment decoder & Priority Encoder.
- c) State the difference between synchronous and asynchronous counters.
- d) State two applications of IC7490.
- e) Define Johnson counter.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Draw logic diagram of a 4-bit magnitude comparator.
 - b) Explain octal to binary encoder.
 - c) Draw logic diagram and truth table of D flip-flop.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain basic counter operation with block diagram.
 - b) Explain working of IC7490 as MOD-5 counter.
 - c) Explain SISO and SIPO shift registers.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain Johnson counter with timing diagram.
 - b) Explain working of IC7447 BCD to 7-segment decoder with circuit diagram.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
MICROBIOLOGY - III
Microbial Macromolecules and Physiology (G04-DSC2-0311)**

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives. (MCQ)**06**

- 1) In bacterial growth curve, the phase where cells are metabolically active but not dividing is _____.
 - a) Lag phase
 - b) Log phase
 - c) Stationary phase
 - d) Death phase
- 2) Penicillin inhibits bacterial growth by interfering with _____.
 - a) Protein synthesis
 - b) DNA replication
 - c) Cell wall synthesis
 - d) RNA transcription
- 3) Which hypothesis explains enzyme-substrate interaction as a perfect fit, like a key in a lock?
 - a) Induced fit hypothesis
 - b) Lock and key hypothesis
 - c) Fluid mosaic model
 - d) Signal hypothesis
- 4) Which of the following is the genetic material in most organisms?
 - a) Protein
 - b) Lipid
 - c) DNA
 - d) Carbohydrate
- 5) The protein part of an enzyme without its cofactor is called _____.
 - a) Apoenzyme
 - b) Holoenzyme
 - c) Coenzyme
 - d) Prosthetic group
- 6) Turbidity measurement of a culture is used to determine _____.
 - a) Cell mass
 - b) Cell activity
 - c) Cell shape
 - d) Cell number by DMC

Q.2 Answer the following. (Any Three)**06**

- a) Write a note on types carbohydrates.
- b) Define Continuous growth.
- c) Differentiate between Coenzyme and Cofactor.
- d) Enlist type of enzyme with suitable example.
- e) Define Active Site.

- Q.3 Answer the following. (Any Two) 06**
- a) Write a short note on the functions of Proteins.
 - b) Explain the Induced fit hypothesis of enzyme action.
 - c) Write a short note on the effect of Temperature on bacterial growth.
- Q.4 Answer the following. (Any Two) 06**
- a) Write a short note on the structure of DNA.
 - b) Explain in detail Lock and key hypothesis.
 - c) Write a short note on the SPC for determination of cell number.
- Q.5 Answer the following. (Any One) 06**
- a) Explain the concept Bacterial growth Phases.
 - b) Describe in detail effect of oxygen on bacterial growth.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
GEOGRAPHY - III
Geography of India - I (G04-DSC2-0313)**

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw diagrams wherever necessary.

Q.1 Choose correct alternative. (MCQ)**06**

- 1) _____ is the oldest mountain range in India.
 - a) Himalayas
 - b) Satpura
 - c) Aravali
 - d) Nilgiri

- 2) _____ is the largest physiographic division of India.
 - a) The Northern Mountains
 - b) The Plains
 - c) The Peninsular Plateau area
 - d) The Islands

- 3) _____ type of soil found in Maharashtra.
 - a) Red soil
 - b) Alluvial soil
 - c) Laterite soil
 - d) Regur soil

- 4) India is located in the _____ hemisphere.
 - a) South and West
 - b) North and East
 - c) North and West
 - d) South and East

- 5) Thorny bushes are found in the _____ forest.
 - a) Evergreen
 - b) Deciduous
 - c) Arid
 - d) Mountains

- 6) Forests that are found on mountain slopes and vary with altitude are called _____.
 - a) Deciduous Forests
 - b) Mountain Forests
 - c) Mangrove Forests
 - d) Thorn Forests

Q.2 Answer the following. (Any Three)**06**

- a) Define the concept of Monsoon.
- b) Define the concept of Climate.
- c) Define the relative location of India.
- d) Define the Soil.
- e) Define the concept of forest conservation.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the Climatic region of India.
 - b) Importance of Monsoon in India.
 - c) Explain the soil conservation methods of India.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain the Northern Mountain of India.
 - b) Explain the types of soil of India.
 - c) Explain the types of Natural vegetation of India.
- Q.5 Answer the following. (Any One) 06**
- a) Explain the Peninsular Plateau region of India.
 - b) Explain the forest conservation methods of India.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
COMPUTER SCIENCE - III
Data Visualization (G04-DSC2-0315)**

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat labelled diagrams wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Multiple choice question.**06**

- 1) _____ allows combining multiple queries into a single result set by appending rows.
 - a) Merge Queries
 - b) Append Queries
 - c) Split Queries
 - d) Combine Columns
- 2) Which feature in Power BI allows creating relationships between tables?
 - a) Data View
 - b) Power Query
 - c) Report View
 - d) Model View
- 3) Which filter type in Power BI is applied to a single visual only?
 - a) Report-level filter
 - b) Page-level filter
 - c) Visual-level filter
 - d) Slicer
- 4) _____ are reusable calculations written using DAX in Power BI.
 - a) Columns
 - b) Filters
 - c) Measures
 - d) Queries
- 5) _____ is a visualization that shows data in rows and columns similar to Excel tables.
 - a) Table
 - b) Matrix
 - c) Card
 - d) KPI
- 6) In Power BI, _____ determines how visuals respond to filters and slicers.
 - a) Drill through
 - b) Edit Interactions
 - c) Cross Filtering
 - d) Manage Relationships

Q.2 Attempt the following. (Any Three)**06**

- a) What are Tooltips in Power BI visuals?
- b) Difference between Cross Filter Direction: Single vs Both.
- c) What is a Calculated Table in Power BI?
- d) Define "Drill-down" and "Drill-up" in Power BI charts.
- e) List any four advantages of using Power BI for Business Intelligence.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain Date DAX functions with examples.
 - b) Explain the Architecture of Power BI with diagram.
 - c) Difference between Donut chart and Pie chart.
- Q.4 Answer the following. (Any Two) 06**
- a) What is a scatter Chart? Explain its purpose and give examples of its use in business.
 - b) What is the Matrix visual and how is it different from a Table visual?
 - c) Explain any three DAX logical functions and their use.
- Q.5 Answer the following. (Any One) 06**
- a) What is a KPI visual? Explain its components and how it is used to monitor performance.
 - b) Describe Power Query transformations like Split Column, Merge Columns, Replace Values, and Remove Columns with examples.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
GEOLOGY - III
Elements of Rocks - I (Igneous Rocks) (G04-DSC2-0317)**

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:**
- 1) All questions are compulsory.
 - 2) Draw diagrams wherever necessary.
 - 3) Figures to the right indicate full marks.
 - 4) Use of logarithmic table and non-programmable calculator is allowed.

Q.1 Select the most correct alternatives from among those given below: 06

- 1) Igneous rocks are formed by _____.
 - a) Compaction of sediments
 - b) Alteration of pre-existing rocks
 - c) Cooling and solidification of magma/lava
 - d) Weathering of existing rocks

- 2) Magma differs from lava in being _____.
 - a) Fine-grained
 - b) Present on the surface
 - c) Beneath the Earth's surface
 - d) Always ultramafic

- 3) Columnar structure is best developed in _____.

a) Basalt	b) Granite
c) Diorite	d) Syenite

- 4) Granitic texture refers to _____.
 - a) Very coarse crystals with rare minerals
 - b) Equigranular, coarse-grained interlocking crystals
 - c) Intergrowth of quartz and feldspar
 - d) Glassy lava

- 5) Porphyritic texture is characterized by _____.
 - a) Large crystals in a fine groundmass
 - b) Flow structure in lava
 - c) Vesicles filled with minerals
 - d) Glassy conchoidal fracture

- 6) Amygdaloidal structure develops when _____.
- a) Vesicles are filled with secondary minerals
 - b) Quartz-feldspar intergrowth develops
 - c) Lava shows flow lines
 - d) Magma intrudes as dyke

Q.2 Answer the following. (Any Three) 06

- a) Define rock.
- b) What is a vesicular structure?
- c) What is meant by silica-oversaturated igneous rocks?
- d) Define Graphic texture.
- e) Define dyke.

Q.3 Answer the following. (Any Two) 06

- a) Write short notes on the rock cycle.
- b) Explain pillow structure with neat labelled diagram.
- c) Differentiate between rhyolite and basalt.

Q.4 Answer the following. (Any Two) 06

- a) What is ophitic texture? Give example.
- b) What are the mineral constituents of basalt?
- c) Write a short petrographic description of dolerite.

Q.5 Answer the following. (Any One) 06

- a) Describe the concordant form of igneous rocks with neat sketches.
- b) Describe any two structures of Igneous rocks with neat labelled diagram.

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B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
MATHEMATICS - III
Fundamentals of Differential Calculus (G04-DSC2-0319)

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Show all necessary steps in calculations.

Q.1 Choose the correct alternative. (MCQ)**06**

- 1) The Maximum value of $\sin x + \cos x$ is _____.
 - a) 2
 - b) $\sqrt{2}$
 - c) 1
 - d) None of these
- 2) If $u = p + q$ and $v = pq$ then $\frac{\partial(u,v)}{\partial(p,q)}$
 - a) $p - q$
 - b) $q - p$
 - c) 0
 - d) -1
- 3) The Pedal formula for the radius of curvature is _____.
 - a) $\rho = r + \frac{dr}{dp}$
 - b) $\rho = \frac{dp}{dr}$
 - c) $\rho = r \frac{dr}{dp}$
 - d) None
- 4) The function $F(x, y)$ has an extreme value at (a, b) then _____.
 - a) $AC - B^2 > 0$
 - b) $AC - B^2 < 0$
 - c) $AC - B^2 = 0$
 - d) None of these
- 5) If u, v are functions of x, y then Jacobian of u, v with respect to x, y is a determinant of order _____.
 - a) 4
 - b) 3
 - c) 2
 - d) n
- 6) The intrinsic formula for the radius of curvature is _____.
 - a) $\rho = \frac{dy}{dx}$
 - b) $\rho = \frac{ds}{d\psi}$
 - c) $\rho = \frac{1}{s} \frac{ds}{d\psi}$
 - d) None

Q.2 Answer the following questions. (Any Three) 06

- a) If $x = a(u + v)$, $y = b(u - v)$ and $u = r^2 \cos 2\theta$, $v = r^2 \sin 2\theta$ then find $\frac{\partial(x,y)}{\partial(r,\theta)}$
- b) Find the maximum & minimum value of the $f(x) = 2x^3 - 15x^2 + 36x + 10$.
- c) Find the radius of curvature at point $s = 4a \sin \psi$ at $\psi = 0$
- d) Show that the functions are dependent to each other
 $u = x + y + z$, $v = x - y + z$, $w = x^2 + y^2 + z^2 - 2yz$ are dependent.
- e) Find the radius of curvature at any point on the curve $y = c \cosh\left(\frac{x}{c}\right)$

Q.3 Answer the following questions. (Any Two) 06

- a) Show that maximum value at $\left(\frac{1}{x}\right)^x$ is $e^{1/e}$
- b) If $u^3 + v^3 = x + y$, $u^2 + v^2 = x^3 + y^3$ show that $\frac{\partial(u,v)}{\partial(x,y)} = \frac{1}{2} \frac{y^2 - x^2}{uv(u-v)}$
- c) Find the radius of curvature at any point of the curve
 $x = a \cos^3 \theta$, $y = a \sin^3 \theta$ at $\frac{\pi}{4}$

Q.4 Answer the following questions. (Any Two) 06

- a) If $u = x^2 + y^2 + z^2$, $v = x + y + z$ and $w = xy + yz + zx$
 Prove that $\frac{\partial(u,v,w)}{\partial(x,y,z)} = 0$
- b) Prove that ρ at the point on the curve
 $x = a(\cos t + t \sin t)$, $y = a(\sin t - t \cos t)$ is 'at'.
- c) Explain Lagrange's method of undetermined multiplier to find extreme value of $u = f(x, y)$ subject to condition $\phi(x, y) = 0$

Q.5 Answer the following question. (Any One) 06

- a) If J is Jacobian at u, v, w with respect to x, y, z & J' is a Jacobian of x, y, z with respect to u, v, w . Then show that $J \cdot J' = 1$.
- b) Derive the expression for radius of curvature (ρ) for the curve $y = f(x)$ i.e. Cartesian equation.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
STATISTICS - III**

Introduction to Discrete Probability Distributions (G04-DSC2-0321)

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.**06**

- 1) Which of the following is a condition of $P(X)$ to be probability mass function?
 - a) $P(x) \geq 0$
 - b) $\sum P(x) = 1$
 - c) Both a and b
 - d) Any one of a) and b)
- 2) Which of the following is a probability distribution?
 - a) (0.2, 0.2, 0.7)
 - b) (0.7, 0.2, 0.1)
 - c) (0.2, 0.1, 0.9)
 - d) (0.1, 0.6, 0.2)
- 3) For a discrete random variable X , the second moment about mean is called as second _____ moment.
 - a) Raw
 - b) Factorial
 - c) Central
 - d) None of these
- 4) Let X be a discrete uniform distribution taking values 5, 6, 7, ..., 14, then $P(X > 9)$ is _____.
 - a) 0.5
 - b) 0.6
 - c) 0.4
 - d) 0.7
- 5) For which distribution mean and variance are same?
 - a) Uniform distribution
 - b) Binomial distribution
 - c) Poisson distribution
 - d) Geometric distribution
- 6) If X and Y are independent r. v.s then _____.
 - a) $E(XY) = E(X).E(Y)$
 - b) $P(x, y) = P(x).P(y)$
 - c) $P(x + y)S = Px(S).Py(S)$
 - d) All of the above

- Q.2 Answer the following. (Any Three) 06**
- a) Define probability mass function (p.m.f.) of discrete random variable X .
 - b) Show that $E(aX + b) = a E(X) + b$
 - c) Define binomial distribution.
 - d) Define negative binomial distribution.
 - e) Define marginal probability distribution of X , when (X, Y) be a two dimensional discrete r. v.
- Q.3 Answer the following. (Any Two) 06**
- a) State and prove recurrence relation for probability of Binomial distribution.
 - b) State and prove lack of memory property of geometric distribution.
 - c) Let (X, Y) be two dimensional discrete random variable, state and prove addition theorem on expectation.
- Q.4 Answer the following. (Any Two) 06**
- a) State and prove recurrence relation for probability of Poisson distribution.
 - b) State the properties of cumulative distribution function.
 - c) Find mean of Hyper-geometric distribution.
- Q.5 Answer the following. (Any One) 06**
- a) Find probability generating function of binomial distribution. Hence find mean and variance.
 - b) Find mean and variance of Poisson distribution.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
ENVIRONMENTAL SCIENCE - III
Environmental Issues and Case Studies (G04-DSC2-0323)**

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.**06**

- 1) Which city is often cited as a case study for urban air pollution due to vehicular emissions?
 - a) Mumbai
 - b) Beijing
 - c) Kolkata
 - d) Chennai
- 2) The Ganga Action Plan is primarily aimed at _____.
 - a) Soil restoration
 - b) River pollution control
 - c) Air quality improvement
 - d) Biodiversity conservation
- 3) Melting glaciers in the Himalayas are considered indicators of _____.
 - a) Air pollution
 - b) Soil degradation
 - c) Climate change
 - d) Biodiversity loss
- 4) Groundwater depletion in India is often studied in relation to _____.
 - a) Industrial pollution
 - b) Water conservation strategies
 - c) Desertification
 - d) Climate adaptation
- 5) Swachh Bharat Abhiyan is primarily a case study of _____.
 - a) Renewable energy
 - b) Solid waste management
 - c) Disaster recovery
 - d) Biodiversity conservation
- 6) E-waste management is an example of _____.
 - a) Circular economy
 - b) Climate adaptation
 - c) Deforestation control
 - d) Groundwater conservation

Q.2 Answer the following. (Any Three)**06**

- a) Define air pollution.
- b) What is the objective of the Ganga Action Plan?
- c) Mention one major cause of groundwater depletion.
- d) What is solid waste management?
- e) Define circular economy.

- Q.3 Answer the following. (Any Two) 06**
- a) Discuss the consequences of groundwater depletion.
 - b) Explain desertification with an example.
 - c) Explain the importance of Project Tiger.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain one renewable energy initiative in India.
 - b) Describe disaster management and mitigation measures.
 - c) Explain the concept of green buildings.
- Q.5 Answer the following. (Any One) 06**
- a) Discuss water pollution and conservation with case studies of river pollution and groundwater depletion.
 - b) Discuss climate change, global impacts, and adaptation strategies.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
BIOCHEMISTRY - I
Biomolecules (G04-DSC2-0325)**

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw diagrams wherever necessary.

Q.1 Choose the correct alternatives.**06**

- 1) Which of the following is an Aldotriose?

a) Dihydroxyacetone	b) Glyceraldehyde
c) Ribulose	d) Erythrose

- 2) Which type of monosaccharide is majorly found in human body?

a) D type	b) L type
c) DL type	d) None of the above

- 3) Simplest amino acid is _____.

a) methionine	b) glycine
c) tyrosine	d) proline

- 4) Which ring is present in structure of Niacin?

a) Benzene	b) Furan
c) Pyridine	d) Pyrrole

- 5) How many hydrogen bonds Adenine make with Thymine?

a) 3	b) 2
c) 4	d) 1

- 6) Nucleotides are made of _____.

a) nitrogenous base	b) sugar
c) phosphate group	d) All of the above

Q.2 Answer the following. (Any Three)**06**

- a) Draw structure of stearic acid and linoleic acid.
- b) Write the structure of two aromatic amino acids.
- c) What are anomers?
- d) What is isoelectric pH?
- e) Define primary structure of protein.

- Q.3 Answer the following. (Any Two) 06**
- a) Define holoenzyme, prosthetic group and cofactor.
 - b) What are phospholipids? Give two examples of it.
 - c) Write a note on secondary structure of proteins.
- Q.4 Answer the following. (Any Two) 06**
- a) Write about structure and function of t-RNA.
 - b) Describe Watson and Crick model of DNA.
 - c) Write a note on Fluid mosaic model of plasma membrane.
- Q.5 Answer the following. (Any One) 06**
- a) Write the structure, biochemical role and deficiency disorder of riboflavin.
 - b) Define pentose and hexose monosaccharide. Write structure of ribose and glucose and their biological importance.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
GEOCHEMISTRY
Introduction to Geochemistry (G04-DSC2-0327)**

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.
4) Use of logarithmic table and calculator is allowed.

Q.1 Choose the correct alternatives for the following.**06**

- 1) Gibbs phase rule is represented as _____.
 - a) $F = C - P + 2$
 - b) $F = C + P - 2$
 - c) $F = C - P - 2$
 - d) $F = C + P + 2$
- 2) What is a characteristic feature of crystalline solids?
 - a) Random arrangement of particles
 - b) Long-range order of particles
 - c) High compressibility
 - d) Low melting point
- 3) Tyndall effect can be defined as _____.
 - a) The scattering of light by colloidal particles
 - b) The absorption of light by colloidal particles
 - c) The reflection of light by colloidal particles
 - d) The transmission of light by colloidal particles
- 4) What are the three phases that coexist at the triple point of water?
 - a) Ice, water, and water vapor
 - b) Ice, water, and steam
 - c) Water, water vapor, and ice
 - d) Ice, water vapor, and steam
- 5) The coordination number of Cl^- in the NaCl structure is _____.
 - a) 4
 - b) 6
 - c) 8
 - d) 12
- 6) Generally, clay minerals are _____.
 - a) A group of minerals that are typically coarse-grained and crystalline
 - b) A group of minerals that are typically fine-grained and colloidal
 - c) A group of minerals that are typically metamorphic
 - d) A group of minerals that are typically igneous

- Q.2 Answer the following. (Any Three) 06**
- a) What is Goldschmidt's Mineralogical phase rule?
 - b) What is a homologous series?
 - c) How many degrees of freedom are there in a one-component system with two phases in equilibrium?
 - d) Give the significance of silica in geological systems.
 - e) Mention different types of colloidal systems.
- Q.3 Answer the following. (Any Two) 06**
- a) Principles of crystal structure
 - b) Goldschmidt's Mineralogical phase rule
 - c) Empirical and molecular formula of organic compounds
- Q.4 Answer the following. (Any Two) 06**
- a) Write a brief note on radii of common ions in rock forming minerals.
 - b) Discuss the term clay minerals as colloids.
 - c) Describe different kinds of colloidal systems.
- Q.5 Answer the following. (Any One) 06**
- a) Describe phase diagram of sulphur system.
 - b) Explain the crystal structure of cesium Chloride.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
PLANT PROTECTION
Major Crops and Methods of Integrated Plant Protection
(G04-DSC2-0329)**

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative.**06**

- 1) Rose flowers are used to prepare _____.
 - a) Jam
 - b) Gulabjal
 - c) Jelly
 - d) None of these

- 2) Sugarcane crop is used to manufacture _____.
 - a) Jaggery
 - b) Straws
 - c) Steele
 - d) Dongue

- 3) The following is one of the algal biofertilizer _____.
 - a) Penicillium
 - b) Anabaena
 - c) Yeast
 - d) Pseudomonas culture

- 4) Field sanitation means _____.
 - a) Clean field with destruction or diseased debris
 - b) Field spraying
 - c) Field digging
 - d) None of these

- 5) Bordeaux mixture are used to kill _____.
 - a) Fungi
 - b) Algae
 - c) Viruses
 - d) Pteridophytes

- 6) Sticky bands are used to prevent _____.
 - a) Aves movement
 - b) Reptile movement
 - c) Birds' movement
 - d) Cawing insects' movement towards host

- Q.2 Answer the following questions. (Any Three) 06**
- a) Give the significance of Plant Protection.
 - b) Give the role of organic farming in agriculture.
 - c) What is crop dragging?
 - d) Why the need of soil solarization?
 - e) What is netting?
- Q.3 Answer the following questions. (Any Two) 06**
- a) Write on biological control of insect pests & diseases.
 - b) What are nematicides?
 - c) Use of sticky bonds
- Q.4 Answer the following questions. (Any Two) 06**
- a) Give the types of biofertilizers, with their applications.
 - b) Explain – rope dragging.
 - c) Fungicides
- Q.5 Answer the following question. (Any One) 06**
- a) Give the crop identification, soil type, tillage, seed rate & spacing, intercultural operation, fertilizer, irrigation, intercropping, yield & economic importance of Soyabean.
- OR**
- b) Give the crop identification, soil type, tillage, seed rate & spacing, intercultural operations, fertilizers, irrigation, intercropping, yield & economic importance of Brinjal.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April - 2026
METEOROLOGY
Climatology (G04-DSC2-0331)**

Day & Date: Wednesday, 08-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options.

06

- 1) The most abundant gas in the atmosphere is _____.
a) Oxygen b) Argon
c) Nitrogen d) Carbon dioxide
- 2) Which layer is the coldest?
a) Troposphere b) Stratosphere
c) Mesosphere d) Thermosphere
- 3) Westerlies blow between _____.
a) 0° - 30° b) 30° - 60°
c) 60° - 90° d) 90° - 120°
- 4) Monsoon winds are part of _____.
a) Primary circulation b) Secondary circulation
c) Tertiary circulation d) Local circulation
- 5) In the Southern Hemisphere, winds are deflected to the _____.
a) Left b) Right
c) East d) West
- 6) The layer important for radio communication is _____.
a) Stratosphere b) Mesosphere
c) Ionosphere d) Exosphere

Q.2 Answer the following. (Any Three)

06

- a) Differentiate between climatology and meteorology.
- b) Name the major gases of the atmosphere with their percentage.
- c) What is secondary circulation?
- d) Define trade winds.
- e) Why are winds deflected in the Northern Hemisphere?

Q.3 Answer the following. (Any Two) 06
a) Composition of atmosphere
b) Importance of climatology in human life
c) Ozone layer and its significance

Q.4 Answer the following. (Any Two) 06
a) Tertiary circulation with examples.
b) Differences between Northern and Southern hemisphere circulation.
c) Factors modifying the idealized general circulation.

Q.5 Answer the following. (Any One) 06
a) Explain the vertical structure of the atmosphere.
OR
b) Explain the nature and scope of climatology.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
PHYSICS - IV
Python Programming (G04-DSC2-0302)**

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.**06**

- 1) Who developed Python Programming Language?
 - a) Wick van Rossum
 - b) Rasmus Lerdorf
 - c) Guido van Rossum
 - d) Niene Stom
- 2) Which of the following is a valid variable name in Python?
 - a) @var
 - b) var 2
 - c) var_2
 - d) 2var
- 3) Which function is used to get input from the user in Python?
 - a) get()
 - b) input()
 - c) read()
 - d) scanf()
- 4) What is the correct syntax to create a tuple?
 - a) a=[1, 2, 3]
 - b) a={1, 2, 3}
 - c) a=(1, 2, 3)
 - d) tuple=[1, 2, 3]
- 5) Which module is used to generate random numbers?
 - a) Random
 - b) os
 - c) time
 - d) math
- 6) Dictionary keys must be _____.
 - a) Mutable
 - b) Unique
 - c) Both a) and b)
 - d) None of the above

Q.2 Answer the following. (Any Three)**06**

- a) What is Data Dictionary?
- b) What are the steps for executing a Python program?
- c) What is keyword?
- d) Define formal and actual parameters.
- e) Define global and local variables

- Q.3 Answer the following. (Any Two) 06**
- a) Write any three string functions and explain with examples.
 - b) What is data type? State its types.
 - c) Define list. Explain any two functions of list with example.
- Q.4 Answer the following. (Any Two) 06**
- a) What is a tuple? Difference between list and tuple.
 - b) What is function? state its types.
 - c) What is operator? Explain arithmetic operators in Python.
- Q.5 Answer the following. (Any One) 06**
- a) What is python? Explain the features of Python.
 - b) What is a module in Python? Explain any one module with example.

- Q.3 Write Short Notes. (Any Two)** **06**
- a) Titrimetric analysis
 - b) Occurrence of metals
 - c) Adulteration of pulses
- Q.4 Answer the following. (Any Two)** **06**
- a) Distinguish between Normality and Molarity.
 - b) Explain various types of paper chromatography.
 - c) Discuss various types of chemical reduction.
- Q.5 Answer the following. (Any One)** **06**
- a) Explain the terms:
 - i) polar and non-polar molecules
 - ii) dielectric constant and
 - iii) molar polarization
 - b) What is reduction of ore? Explain electrolytic reduction of aluminium.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
GENERAL CHEMISTRY- II
General Pharmaceutical Chemistry (G04-DSC2-0336)**

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives:**06**

- 1) _____ is the formula for calculating risk.
 - a) Hazard + Severity = Risk
 - b) Probability of event \times Severity of event = Risk
 - c) Hazard \times Risk = Severity
 - d) None of the above

- 2) The first step in risk assessment is _____.
 - a) Exposure assessment
 - b) Toxicity assessment
 - c) Hazard identification
 - d) Risk characterization

- 3) Ethambutol is primarily used in the treatment of _____.
 - a) Anxiety disorders
 - b) Parasitic worm infections
 - c) Tuberculosis
 - d) Fungal infections

- 4) The synthesis of diazepam is initiated by the reaction between 2-amino-5-chlorobenzophenone and _____.
 - a) Methyl isothiocyanate
 - b) Glycine ethyl ester
 - c) Benzyl chloride
 - d) 2,4-dichlorophenacylbromide

- 5) Quantitative analysis focuses on _____.
 - a) Determining what is present in a sample
 - b) Measuring the amount or concentration of a substance
 - c) Identifying the functional groups in a molecule
 - d) Studying the chemical bonding within a compound

- 6) _____ is a common chelating agent used in complexometric titrations.
 - a) Starch
 - b) Phenolphthalein
 - c) EDTA
 - d) Potassium permanganate

- Q.2 Answer the following. (Any Three) 06**
- a) Write a note on Material Safety Data Sheets (MSDS).
 - b) Give classification of hazards.
 - c) Define mole fraction and give its formula.
 - d) Enlist the names of indicators used in different titrations.
 - e) Give uses of:
 - 1) Ethambutol
 - 2) Miconazole
- Q.3 Answer the following. (Any Two) 06**
- a) Define:
 - 1) Molarity
 - 2) Molality
 - 3) Normality
 - b) Explain in detail synthesis of Epichlorohydrin from Propene.
 - c) Give differences between fire and explosions.
- Q.4 Answer the following. (Any Two) 06**
- a) Elaborate on evaluation and control for industrial hygiene.
 - b) Give different % composition by weight and by volume.
 - c) Explain in detail synthesis of Diazepam.
- Q.5 Answer the following. (Any One) 06**
- a) Explain in detail toxicology.
 - b) Explain in detail classification of titrimetric analysis.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
BOTANY - IV
Introduction to Plant Protection (G04-DSC2-0306)**

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative. (MCQ) 06

- 1) Soyabean crop is taken in _____ season.
 - a) Kharip
 - b) Rabbi
 - c) Summer
 - d) None of the above
- 2) Grape berries are used for preparing _____.
 - a) Asawa
 - b) Kishmish
 - c) Kadha
 - d) Churna
- 3) Bordeaux mixture is used to kill _____.
 - a) Bryophytes
 - b) Pteridophytes
 - c) fungi
 - d) Algae
- 4) Chemicals used to check bacteria are called _____.
 - a) Fungicides
 - b) Insecticides
 - c) Bactericides
 - d) Nematicides
- 5) Botanical name of brinjal is _____.
 - a) Egg plant
 - b) *Ciser sp.*
 - c) *Cajanus Cajan*
 - d) *Solanum melongena*
- 6) Soyabean belongs to family _____.
 - a) Fabaceae
 - b) Rutaceae
 - c) Rosasae
 - d) Bignoniaceae

Q.2 Answer the following. (Any Three) 06

- a) What is plant protection?
- b) Define crop hygiene.
- c) Define pest.
- d) What is bagging?
- e) Define irrigation.

- Q.3 Answer the following. (Any Two) 06**
- a) Write the significance of plant protection.
 - b) Write in brief account and uses of fungicides.
 - c) Explain in brief physical methods of plant protection.
- Q.4 Answer the following. (Any Two) 06**
- a) Write in brief account and uses of bactericides.
 - b) Describe in brief mechanical methods of plant protection.
 - c) Write brief account on biological control in plant protection.
- Q.5 Answer the following. (Any One) 06**
- a) Give the crop identification, soil types, seed rate and spacing, intercultural operations, fertilizers, irrigation, intercropping of brinjal.
 - b) Give the crop identification, soil types, seed rate and spacing, intercultural operations, fertilizers, irrigation, intercropping of Rose.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
ZOOLOGY - IV
Techniques in Biology (G04-DSC2-0308)**

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams wherever necessary.

Q.1 Choose correct alternative: 06

- 1) What is the primary ethical principle guiding the treatment of animals in research?
 - a) minimizing harm
 - b) maximizing benefits
 - c) ensuring animal welfare
 - d) All of these

- 2) Which of the following is NOT a component of a typical light microscope?
 - a) electron source
 - b) eyepiece
 - c) objective lens
 - d) condenser

- 3) Which of the following is used as spraying reagent in paper chromatography?
 - a) hydrochloric acids
 - b) ninhydrin solution
 - c) sodium chloride solution
 - d) copper sulphate solution

- 4) A hemocytometer is a special counting chamber designed for counting _____.
 - a) bones
 - b) nerves
 - c) blood cells
 - d) pulse rate

- 5) Beer's law states that the intensity of light decrease with respect to _____.
 - a) concentration
 - b) distance
 - c) composition
 - d) volume

- 6) Which technique separates charged particles using electric field?
 - a) Hydrolysis
 - b) Electrophoresis
 - c) Protein synthesis
 - d) Protein denaturing

Q.2 Answer the following. (Any Three) 06

- a) Significance of Biological technique in health
- b) Compound microscope
- c) Paper Chromatography
- d) Pasteurization
- e) Hemoglobinometer

- Q.3 Answer the following. (Any Two) 06**
- a) Significance of Colorimeter.
 - b) Gel electrophoresis.
 - c) Applications of centrifugation.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain principles of Microscopy.
 - b) Describe sterilization method in Biology by chemical disinfectants.
 - c) PAGE electrophoresis.
- Q.5 Answer the following. (Any One) 06**
- a) Describe thin layer chromatography.
 - b) Explain role of Biological techniques in research and industry.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
ELECTRONICS - IV
Analog Electronics (G04-DSC2-0310)**

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.**06**

- 1) The energy gap in a Semiconductor is typically _____.
 - a) Less than 1 eV
 - b) Around 1 eV
 - c) Between 3-7 eV
 - d) Zero
- 2) Doping a semiconductor with pentavalent impurities produces _____.
 - a) P-type
 - b) N-type
 - c) Intrinsic
 - d) Insulator
- 3) The depletion region in a P-N junction contains _____.
 - a) Free electrons only
 - b) Holes only
 - c) +ve & -ve Ions
 - d) Both electrons and holes
- 4) Forward bias in a P-N junction _____.
 - a) Widens the depletion region
 - b) Narrows the depletion region
 - c) Has no effect on depletion region
 - d) Creates more potential barrier
- 5) _____ is used as a voltage regulator.
 - a) LED
 - b) Zener diode
 - c) TRIAC
 - d) SCR
- 6) Majority carriers in N-type semiconductor are _____.
 - a) Holes
 - b) Electrons
 - c) Protons
 - d) None

Q.2 Answer the following. (Any Three)**06**

- a) Define intrinsic semiconductor.
- b) Differentiate between N-type and P-type semiconductors.
- c) What is junction capacitance?
- d) What is Inversion layer in MOSFET?
- e) Define avalanche breakdown.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain N-type semiconductor with the help of doping process.
 - b) Explain forward biasing of a P-N junction diode with characteristics.
 - c) Explain the breakdown mechanism of a Zener diode.
- Q.4 Answer the following. (Any Two) 06**
- a) Compare BJT and FET (any three points).
 - b) Explain the working of SCR with diagram.
 - c) Describe the operation of DIAC.
- Q.5 Answer the following. (Any One) 06**
- a) Draw and explain the construction of JFET.
 - b) Explain the working of an LDR with diagram.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
MICROBIOLOGY - IV
Microbial Genetics (G04-DSC2-0312)**

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative. 06

- 1) The mutation in which purine is replaced pyrimidine is called as _____.
 - a) Transition
 - b) Translocation
 - c) Deletion
 - d) Transversion

- 2) The T -T dimer formed after exposure of U.V. light is repaired by photolyase enzyme is known as _____.
 - a) Transduction
 - b) Photolysis
 - c) Photo reactivation
 - d) Transcription

- 3) Semi -conservative mode of replication experimentally proved by scientist _____.
 - a) Griffith
 - b) Meselson and Stahl's
 - c) Watson and Crick
 - d) Rosalind Franklin

- 4) The sigma subunit of the RNA polymerase involved during ____ stage of bacterial transcription.
 - a) Initiation
 - b) Elongation
 - c) Splicing
 - d) Termination

- 5) _____ enzyme synthesize short RNA primer during DNA replication.
 - a) DNA Primase
 - b) DNA gyrase
 - c) DNA Ligase
 - d) DNA Helicase

- 6) Which bond is used to stabilize the double helix of DNA?
 - a) Hydrophobic bond
 - b) Hydrogen bond
 - c) Covalent bond
 - d) Ionic bond

Q.2 Answer the following. (Any Three) 06

- a) Define Genome.
- b) What is Silent mutation?
- c) Write the function of RNA polymerase enzyme.
- d) Define Cistron.
- e) Define Mutagen.

- Q.3 Answer the following. (Any Two) 06**
- a) Discuss in short Griffith's experiment.
 - b) Give a brief account on Missense and nonsense mutation.
 - c) Explain Frame shift mutation.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain in detail Watson and Crick Model of DNA.
 - b) Give a brief account on replica plate technique.
 - c) Write an account on mechanism of Translation in bacteria.
- Q.5 Answer the following. (Any One) 06**
- a) Explain in detail Induced mutation by chemical mutagens.
 - b) What is mean by DNA repair? Give a detailed account on Dark repair Mechanism.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
GEOGRAPHY - IV
Geography of India - II (G04-DSC2-0314)**

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams wherever necessary
3) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives. (MCQ)

06

- 1) _____ state has the lowest population of India as per 2011 census.
 - a) Maharashtra
 - b) Sikkim
 - c) West Bengal
 - d) Bihar
- 2) _____ factors affecting the population distribution.
 - a) Physical setting
 - b) Availability of water
 - c) Climate
 - d) All of the above
- 3) _____ State of India has lowest sex ratio as per 2011 census.
 - a) Maharashtra
 - b) Haryana
 - c) Bihar
 - d) Kerala
- 4) _____ is consider highest quality of Iron ore.
 - a) Hematite
 - b) Magnetite
 - c) Siderite
 - d) Limonite
- 5) India has _____ rank to producer of iron ore in the world.
 - a) First
 - b) Second
 - c) Third
 - d) Fourth
- 6) _____ is a type of Kharif crop.
 - a) Rice
 - b) Wheat
 - c) Jawar
 - d) Sugarcane

Q.2 Answer the following. (Any Three)

06

- a) Define the concept of Resources.
- b) Define the concept of growth of population.
- c) State the any three physical factors affecting on population distribution.
- d) Define the concept of information technology.
- e) Define the concept of agriculture productivity.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the factor affecting on distribution of population in India.
 - b) Explain the production of Coal of India.
 - c) Explain the distribution of petroleum of India.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain the production of Rice in India.
 - b) Explain the age and sex composition of India.
 - c) Explain the population distribution of India.
- Q.5 Answer the following. (Any One) 06**
- a) Explain the causes of population growth of India.
 - b) Explain the distribution of Iron ore in India.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
COMPUTER SCIENCE - IV
PHP Programming (G04-DSC2-0316)**

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives. (MCQ)

06

- 1) Which of the following is/are a PHP code editor?
 - a) Notepad ++
 - b) VS Code Editor
 - c) Sublime Text
 - d) All of the above
- 2) Which one of the following property scopes is not supported by PHP?
 - a) public
 - b) final
 - c) friendly
 - d) static
- 3) Which function in PHP is used to get the length of string variable?
 - a) count()
 - b) strcount
 - c) strlen
 - d) len
- 4) Which of following is not a Superglobals in PHP?
 - a) \$_SERVER
 - b) \$_ENV
 - c) \$_FILES
 - d) \$_PUT
- 5) Which method retrieves each row from the prepared statement result and assigns the fields to the bound results?
 - a) get_row()
 - b) fetch_row()
 - c) fetch()
 - d) mysqli_fetch_row()
- 6) Which method rolls back the present transaction?
 - a) commit()
 - b) undo()
 - c) mysqli_rollback()
 - d) rollback()

Q.2 Answer the following. (Any Three)

06

- a) What is basic syntax of PHP?
- b) Include() function.
- c) History of PHP.
- d) List out different functions used for comparing string with example.
- e) MYSQL data types.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain different operators used in PHP.
 - b) What is function? types of function.
 - c) What is session?
- Q.4 Answer the following. (Any Two) 06**
- a) What is validation?
 - b) Explain different parameter passing technique used in PHP with example.
 - c) Explain Global variable in PHP.
- Q.5 Answer the following. (Any One) 06**
- a) Design web page which insert, delete and update records.
 - b) Explain MySQL Architecture in detail.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
GEOLOGY - IV
Elements of Rocks - II (Sedimentary Rocks) (G04-DSC2-0318)**

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw net diagram wherever necessary.

Q.1 Choose the correct alternative from the options.**06**

- 1) _____ is a rudaceous sedimentary rock.
 - a) Sandstone
 - b) Limestone
 - c) Breccia
 - d) Laterite

- 2) Shale contains _____.
 - a) Sand
 - b) Boulder
 - c) Cobble
 - d) Micaceous material

- 3) Limestone formed by precipitation of _____.
 - a) Calcium carbonate
 - b) Iron
 - c) Magnesium sulphate
 - d) Manganese sulphate

- 4) Sediments in Conglomerate are mostly _____.
 - a) Angular
 - b) Sub rounded
 - c) Polygonal
 - d) Cube

- 5) Graded bedding occur in _____ sedimentation.
 - a) Slow
 - b) Medium
 - c) Rapid
 - d) None of these

- 6) Mud cracks occur in _____ rock.
 - a) Rudaceous
 - b) Arenaceous
 - c) Argillaceous
 - d) Chemical

Q.2 Answer the following. (Any Three)**06**

- a) Describe Oolitic limestone.
- b) What is stratification?
- c) Describe bauxite.
- d) Define sedimentary rock.
- e) Describe petrography of shale.

- Q.3 Write the following. (Any Two) 06**
- a) Explain conglomerate and breccia.
 - b) What is cementation?
 - c) Argillaceous rocks with its varieties.
- Q.4 Answer the following. (Any Two) 06**
- a) Describe the bedding and lamination structures in sedimentary rock.
 - b) Describe the clastic texture.
 - c) Describe the Arenaceous sedimentary rock.
- Q.5 Answer the following. (Any One) 06**
- a) Describe the process of formation of sedimentary rock.
 - b) Describe any three various types of sandstones.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
MATHEMATICS - IV
Fundamentals of Laplace Transform (G04-DSC2-0320)**

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives for each of the following.

06

1) If $f(t) = e^{at}$, $a > 0$ then $\mathcal{L}\{e^{at}\} =$

a) $\frac{1}{p}$

b) $\frac{1}{p+a}$

c) $\frac{1}{p-a}$

d) $\frac{1}{p^2+a^2}$

2) $\mathcal{L}^{-1}\left\{\frac{p}{p^2+a^2}\right\} =$

a) $\cos at$

b) $\sin at$

c) $\cosh at$

d) $\sinh at$

3) $\mathcal{L}^{-1}\{f(p)\} = F(t)$ then $\mathcal{L}^{-1}\{pf(p)\} =$ _____

a) $pF(t)$

b) $F(pt)$

c) $F'(t)$

d) $tF(t)$

4) $\mathcal{L}\{e^{at}t^n\} =$ _____

a) $\frac{n!}{(p+a)^n}$

b) $\frac{n!}{(p-a)^n}$

c) $\frac{n!}{(p+a)^{n+1}}$

d) $\frac{n!}{(p-a)^{n+1}}$

5) $\mathcal{L}^{-1}\left\{\tan^{-1}\left(\frac{1}{p}\right)\right\} =$ _____

a) $\sin t$

b) $\frac{1}{t}\sin t$

c) $t \sin t$

d) None of these

6) The Final value Theorem is _____.

- a) $\lim_{t \rightarrow \infty} F(t) = \lim_{p \rightarrow 0} pf(p)$ b) $\lim_{t \rightarrow 0} F(t) = \lim_{p \rightarrow \infty} pf(p)$
 c) $\lim_{t \rightarrow \infty} F(t) = \lim_{t \rightarrow 0} pf(p)$ d) $\lim_{t \rightarrow 0} F(t) = \lim_{p \rightarrow 0} pf(p)$

Q.2 Attempt the following. (Any Three)

06

- a) State and Prove linearity property of Laplace Transform.
 b) Find $\mathcal{L}^{-1} \left\{ \frac{1}{p-2} + \frac{2}{p+5} + \frac{6}{p^4} \right\}$
 c) Find $\mathcal{L}^{-1} \left\{ \frac{1}{p^2-6p+10} \right\}$
 d) Solve $\frac{d^2y}{dt^2} + y = 0$ under the conditions that $y = 1, \frac{dy}{dt} = 0$ when $t = 0$
 e) Find $\mathcal{L}\{\sin t \cos t\}$

Q.3 Attempt the following. (Any Two)

06

- a) If $\mathcal{L}\{F(t)\} = f(p)$, then $\mathcal{L}\{F(at)\} = \frac{1}{a} f\left(\frac{p}{a}\right)$
 b) using Heaviside Expansion Formula, find, $\mathcal{L}^{-1} \left\{ \frac{p^2-6}{p^3+4p^2+3p} \right\}$
 c) State and prove First Translation or shifting Theorem for Inverse Laplace Transform.

Q.4 Attempt the following. (Any Two)

06

- a) State and Prove Second Translation or shifting Theorem for Laplace Transform.
 b) Solve $y'' + y = \cos t$ with initial conditions $y(0) = y'(0) = 0$
 c) Find $\mathcal{L}^{-1} \left\{ \log \left(\frac{p+3}{p+2} \right) \right\}$

Q.5 Attempt the following. (Any One)

06

- a) Let $F(t)$ and $G(t)$ be two functions of class A and let $\mathcal{L}^{-1}\{f(p)\} = F(t)$ and $\mathcal{L}^{-1}\{g(p)\} = G(t)$ then $\mathcal{L}^{-1}\{f(p)g(p)\} = \int_0^t F(x)G(t-x)dx = F * G$
 (Convolution Theorem)
 b) Let $F(t)$ be a periodic function with period $T > 0$, that is $F(u + T) = F(u)$ then show that $\mathcal{L}\{F(t)\} = \frac{1}{1-e^{-pT}} \int_0^T e^{-pt} F(t) dt$

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
STATISTICS – IV
Introduction to Continuous Probability Distribution
(G04-DSC2-0322)**

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of Calculator is allowed

Q.1 Choose the correct alternatives: 06

- 1) If X has p. d. f. $f_x(\cdot)$ and $Y = g(x)$, where $g(\cdot)$ is any real valued function then _____.
 a) $E(Y) = \int y f_y(y) dy$ b) $E(Y) = \int g(y) f_x(y) dy$
 c) $E(Y) = \int g(x) f_x(x) dx$ d) All of these
- 2) Which of the following statement is always true with respect to bivariate r. v. (X, Y) ?
 a) $f_{x,y}(x, y) = f_x(x) \times f_y(y) \forall x, y$
 b) $E(XY) = E(X) \cdot E(Y)$
 c) $E(X + Y) = E(X) + E(Y)$
 d) $E(X/Y)$ is a function of Y
- 3) If $X \sim U(-1, 1)$ then probability that X is negative is _____.
 a) 0 b) 1
 c) 0.5 d) None of these
- 4) If $f(x)$ denotes the p.d.f. and $F(x)$ represents the distribution function of an exponential variate X with mean 4, then $\frac{f(x)}{1-F(x)} =$ _____.
 a) 2 b) $\frac{1}{4}$
 c) 4 d) $\frac{1}{2}$
- 5) Suppose X, Y and Z are three independents $G(6, 2), G(6, 4), G(6, 3)$ variates respectively then the distribution of $U = X + Y + Z$
 a) $G(6, 9)$ b) $G(9, 4)$
 c) $G(12, 9)$ d) $G(9, 12)$

- 6) If X is a $\beta_1(2,3)$ and some results are given below _____.
- | | |
|--|-------------------------------------|
| i) $1 - X \sim \beta_1(3,2)$ | ii) $1 - X \sim \beta_1(2,3)$ |
| iii) $\frac{1-X}{X} \sim \beta_2(2,3)$ | iv) $\frac{1}{X} \sim \beta_2(2,3)$ |
| a) Only (i) | b) (iii) and (iv) |
| c) Only (iii) | d) (ii) and (iii) |

Q.2 Answer the following. (Any Three)

06

- Define cumulative distribution function of r. v. X
- Define conditional expectation of X given $Y = y$ in case of continuous r.v. (X, Y) .
- Define continuous uniform distribution.
- Define gamma distribution with parameters (α, λ) .
- Define beta distribution of second kind.

Q.3 Answer the following. (Any Two)

06

- a) Suppose the pdf of the magnitude X of a dynamic load on a bridge

(in newton's) is
$$f(x) = \begin{cases} \frac{1}{8} + \frac{3}{8}x & ; 0 \leq x \leq 2 \\ 0 & ; \text{otherwise} \end{cases}$$

What are $E(X)$ and $Var(X)$?

- Let X and Y be two continuous random variables, then show that $E(X + Y) = E(X) + E(Y)$
- Find mean and variance of exponential distribution.

Q.4 Answer the following. (Any Two)

06

- Find m.g.f. of gamma distribution with parameter α and λ .
- Find mode of beta distribution of second kind.
- Let random variable X has $U(0, \theta)$ distribution. Find c.d.f. of X , hence determine median of X .

Q.5 Answer the following. (Any One)

06

- a) A random variable X has the p.d.f.

$$f(x) = \begin{cases} 0 & ; x < 0 \\ \frac{3}{8}(x - 2)^2 & ; 0 < x < 2 \\ 0 & ; x > 2 \end{cases}$$

Find the expected value of X and its standard deviation.

- b) If X and Y are independent gamma variates with parameters (α, λ_1) and (α, λ_2) respectively.

Find the distribution of $U = X + Y$ and $V = \frac{X}{X+Y}$

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
Environmental Science – IV
Water and Land Resource Management (G04-DSC2-0324)**

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives. (MCQ)**06**

- 1) Roof top rainwater harvesting is a technique to recharge _____.
 - a) River water
 - b) Ground water
 - c) Lake water
 - d) Ocean water

- 2) Where is most of the Earth water located?
 - a) Polar Icecaps
 - b) Ground water
 - c) Ocean
 - d) Atmosphere

- 3) Approximately what percentage of Earths water is salty?
 - a) 3%
 - b) 70%
 - c) 79%
 - d) 97%

- 4) What is deforestation?
 - a) Planting more trees
 - b) Cutting down and removal of forest
 - c) Creating a new forest
 - d) None of these

- 5) Soil erosion is cause due to _____.
 - a) Water
 - b) Wind
 - c) Deforestation
 - d) All of these

- 6) What is water pollution?
 - a) Contamination of air by harmful gases
 - b) Contamination of water bodies by toxic substances
 - c) Increase the water flow in the river
 - d) Natural cleaning of water

- Q.2 Answer the following. (Any Three) 06**
- a) Define water pollution.
 - b) Define Desertification of soil.
 - c) Write short note on the sources of surface water pollution.
 - d) Write short note on Remote sensing tool for natural resource management.
 - e) Write down water quality parameters for Drinking purpose.
- Q.3 Answer the following. (Any Two) 06**
- a) Draw hydrological cycle diagram.
 - b) Describe the concept Environmental impact assessment.
 - c) Write down any one case studies on river pollution in India.
- Q.4 Answer the following. (Any Two) 06**
- a) Describe Causes of soil erosion.
 - b) Explain Rainwater harvesting system.
 - c) Describe the Causes of water pollution.
- Q.5 Answer the following. (Any One) 06**
- a) Explain and draw hydrological cycle.
 - b) Explain control measures of water pollution.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
BIOCHEMISTRY – II
Biochemical Techniques (G04-DSC2-0326)**

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat labeled diagrams wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Multiple choice questions.**06**

- 1) Sodium dodecyl sulfate used in SDS PAGE is _____.
a) an anionic detergent b) a cationic detergent
c) a nonionic detergent d) a zwitterionic detergent
- 2) In reverse phase chromatography the stationary phase is _____.
a) polar b) nonpolar
c) bipolar d) apolar
- 3) The visible light ranges from _____ in the electromagnetic spectrum.
a) 200 to 400 b) 400 to 800
c) 800 to 1000 d) 1000 to 1400
- 4) Transfer of protein bands onto a membrane can be done by the _____ blotting.
a) southern b) northern
c) western d) eastern
- 5) Which of the following is not an example of a Bioinformatics Data Retrieval tool?
a) Entrez b) SRS
c) DBGET d) ClustalW
- 6) DNSA reagent used for reducing sugar estimation contains _____.
a) 3,5 Di Nitro Salicylic Acid b) 3,6 Di Nitro Salicylic Acid
c) 2,4 Di Nitro Salicylic Acid d) 2,6 Di Nitro Salicylic Acid

Q.2 Answer the following. (Any Three)**06**

- a) Define saponification value of a lipid.
- b) Write names of modern biochemical techniques.
- c) What is BLAST? Write its application.
- d) What are the advantages of spectrophotometer over colorimeter?
- e) Which stains are used for visualizing DNA and protein bands after electrophoresis?

- Q.3 Answer the following. (Any Two) 06**
- a) Describe the factors affecting electrophoretic mobility.
 - b) Write a note on biochemical estimation of protein.
 - c) Write a note on mechanism of separation by gel permeation chromatography.
- Q.4 Answer the following. (Any Two) 06**
- a) Give different applications of bioinformatics.
 - b) Write a note on instrumentation of HPLC.
 - c) Explain the amplification of DNA by PCR.
- Q.5 Answer the following. (Any One) 06**
- a) Describe the technique and applications of southern blotting.
 - b) Describe the technique and applications of ELISA.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
GEOCHEMISTRY**

Introduction to Solar system and Geo-sphere (G04-DSC2-0328)

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.
4) Use of logarithmic table and calculator is allowed.
(At. Wts.: H=1, C=12, O=16, N=14, Na=23, Cl=35.5)

Q.1 Multiple choice questions.

06

- 1) Chondrites are consisting primarily of _____.
 - a) Olivine only
 - b) Pyroxene only
 - c) Olivine and/or pyroxene
 - d) Iron and Nickle
- 2) Siderites consist essentially of _____.
 - a) Nickle - iron alloy
 - b) Nickel-iron alloy and silicates
 - c) Silicates only
 - d) Silicates and graphite
- 3) According to the cosmic abundance which of the following element is abundant?
 - a) Iron
 - b) Carbon
 - c) Silicon
 - d) Hydrogen
- 4) Which of the following contains roughly 80% of the Earth's atmosphere?
 - a) Troposphere
 - b) Stratosphere
 - c) Mesosphere
 - d) Thermosphere
- 5) Who introduced the term siderophile, chalcophile, lithophile, and atmophile?
 - a) Goldschmidt (1923)
 - b) Clarke (1924)
 - c) Ringwood (1975)
 - d) Cameron (1737)
- 6) Which planets revolve around the sun in retrograde rotation?
 - a) Uranus and Venus
 - b) Earth and Mars
 - c) Neptune and Pluto
 - d) Mercury and Jupiter

- Q.2 Answer the following. (Any Three) 06**
- a) According to Clarke (1971), Which is the most abundant rocks in average composition of crust.
 - b) What is the average composition of Terrestrial water?
 - c) Define Widmanstatten Structure.
 - d) Name the types of aerolites
 - e) What is the average composition of Mantle?
- Q.3 Answer the following. (Any Two) 06**
- a) Describe the variable constituents of atmosphere.
 - b) Discuss in brief gains and losses of elements in the oceanic water.
 - c) Write a note on Cosmic abundance of elements.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain in brief composition of meteorites and its types.
 - b) Discuss the zonal structure of Earth.
 - c) Describe the evolution of the atmosphere and its composition.
- Q.5 Answer the following. (Any One) 06**
- a) Explain with suitable diagram the interior structure of the earth with composition of crust.
 - b) Discuss in brief geochemical classification of the elements.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
PLANT PROTECTION
Diseases and their Management (G04-DSC2-0330)**

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw a well diagram wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Multiple Choice Question.**06**

- 1) The ability of pathogen to cause the disease is known as _____.
 - a) Pathogenesis
 - b) Pathogenicity
 - c) Immunity
 - d) Susceptibility
- 2) _____ Diseases spreads throughout entire plant body.
 - a) Localised
 - b) Systemic
 - c) Epidemic
 - d) Sporadic
- 3) _____ disease is classified on the basis of symptoms.
 - a) Infectious
 - b) Non- infectious
 - c) Chlorosis
 - d) None of these
- 4) Causal organism of Grain smut of jowar is _____.
 - a) *Sphacelotheca sorghi*
 - b) *Xanthomonas citr*
 - c) *MLOS*
 - d) *Hibiscus*
- 5) Keeping inoculated micro-organisms on suitable medium at particular temperature and time is process called as _____.
 - a) Isolation
 - b) Infection
 - c) a) & b)
 - d) Incubation
- 6) The entry of plants, plant parts and their products is conditioned, regulated and restricted at national and international levels through _____.
 - a) National Act
 - b) International Act
 - c) Quarantine Act
 - d) None of these

Q.2 Answer the following. (Any Three)**06**

- a) Isolation
- b) Resistant
- c) Pathogenesis
- d) Mention any two fungal disease of plant.
- e) Mention causal organism of Rust of Ground nut.

- Q.3 Write short note on any Two of the following. 06**
- a) Methods of inoculation.
 - b) Control measures of Downy mildew of Grapes.
 - c) Kitchin's Postulates.
- Q.4 Answer the following. (Any Two) 06**
- a) Give an account on classification of plant diseases.
 - b) Write on Assessment of diseases in crop plant.
 - c) Describe the Little leaf of Brinjal.
- Q.5 Answer the following. (Any One) 06**
- a) Write the Principles of plant disease management.
 - b) Describe in details about Grain smut of jawar.

- d) Two locations on the earth separated by 100 m have a pressure difference of 4 mb. Calculate pressure gradient between these locations.
- e) Define gradient of a physical quantity.

Q.3 Answer the following. (Any Two) 06

- a) Discuss composition of the Earth's atmosphere.
- b) What are effects of scattering of light in the Earth's atmosphere?
- c) Write a note on pressure gradient force.

Q.4 Answer the following. (Any Two) 06

- a) Write a note on greenhouse effect.
- b) Discuss Effects of the Coriolis force in nature.
- c) Discuss geostrophic wind.

Q.5 Answer the following. (Any One) 06

- a) Describe scattering, absorption, and absorption of solar radiations in the earth's atmosphere.
- b) Write a note on Earth's rotational deflective force (Coriolis force).

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Set P

B.Sc. (Plain) (सत्र - III) (नवीन) (NEP CBCS) परीक्षा: मार्च / एप्रिल – २०२६
Co-Curricular Course
National Service Scheme (G04-CC-301)

वार, दिनांक: शनिवार, ११-०४-२०२६
वेळ: सकाळी ०९:०० ते १०:३०

कमाल गुण: ३०

सूचना : १) सर्व प्रश्न अनिवार्य आहेत.
२) उजवीकडील अंक पूर्ण गुण दर्शवितात.

प्र.१ खालील दिलेले योग्य पर्याय निवडून गाळलेल्या जागा भरा.

०६

- १) स्वयंसेवा (Volunteerism) म्हणजे ——— .
अ) पगारी सेवा
ब) कोणत्याही मोबदल्याची अपेक्षा न करता सेवा
क) शासकीय काम
ड) व्यावसायिक क्रिया
- २) स्वयंसेवेचे एक महत्त्वाचे वैशिष्ट्य म्हणजे ——— .
अ) स्वार्थ
ब) सामाजिक बांधिलकी
क) नफा मिळवणे
ड) स्पर्धा
- ३) प्रभावी संवाद म्हणजे ——— .
अ) फक्त बोलणे
ब) फक्त लेखन
क) विचार व माहितीची देवाणघेवाण
ड) वाचन
- ४) धोरणात्मक नियोजन (Strategic Planning) ——— वर लक्ष केंद्रित करते.
अ) अनियमित निर्णय
ब) दीर्घकालीन उद्दिष्टे
क) तात्काळ कृती
ड) उद्दिष्टांकडे दुर्लक्ष
- ५) सामाजिक-आर्थिक सर्वेक्षण ——— संबंधित आहे.
अ) हवामान
ब) सामाजिक व आर्थिक स्थिती
क) क्रीडा
ड) वाहतूक
- ६) जनगणना किती कालावधीनंतर घेतली जाते?
अ) दरवर्षी
ब) ५ वर्षांनी
क) १० वर्षांनी
ड) दरमहा

- प्र.२ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही दोन) 0६
- अ) सामाजिक-आर्थिक सर्वेक्षणावर टीप लिहा.
ब) संवादाचे प्रकार लिहा.
क) साक्षरता माहिती संकलनाकरिता प्रश्नावली तयार करा.
ड) नियोजनाचे महत्त्व व मर्यादा लिहा.
- प्र.३ खालील प्रश्नाचे थोडक्यात उत्तर लिहा. (कोणताही एक) 0६
- अ) मुलाखात पद्धतीची प्रक्रिया थोडक्यात स्पष्ट करा.
ब) अहवाल लेखन थोडक्यात स्पष्ट करा.
- प्र.४ खालील प्रश्नाचे सविस्तर उत्तर लिहा. (कोणताही एक) १२
- अ) कार्यक्रमाच्या यशस्वी अंमलबजावणीसाठी आवश्यक बाबी कोणत्या? स्पष्ट करा.
ब) स्वयंसेवेची संकल्पना, भारतातील आदर्श व्यक्तिमत्त्वे आणि प्रभावी स्वयंसेवेसाठी आवश्यक नेतृत्व गुण स्पष्ट करा.

Seat No.	
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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
Co-Curricular Course
National Service Scheme (G04-CC-301)**

Day & Date: Saturday, 11-04-2026
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options. 06

- 1) Volunteerism refers to _____.
 - a) Paid service
 - b) Service without expectation of reward
 - c) Government work
 - d) Business activity
- 2) Key characteristic of volunteerism is _____.
 - a) Self interest
 - b) Social commitment
 - c) Profit motive
 - d) Competition
- 3) Effective communication means _____.
 - a) speaking only
 - b) writing only
 - c) exchange of ideas and information
 - d) reading
- 4) Strategic planning focuses on _____.
 - a) Random decision
 - b) Long term goals
 - c) Immediate action only
 - d) Ignoring objectives
- 5) Socio economic survey related to _____.
 - a) weather
 - b) social and economic condition
 - c) sports
 - d) transport
- 6) Census conducted every _____.
 - a) year
 - b) 5 years
 - c) 10 years
 - d) month

Q.2 Answer the following questions. (Any Two) 06

- a) Write a note on socio economic survey.
- b) Give the types of communication
- c) Design of Questionnaire to collect Literacy data.
- d) Write the importance and limitation of planning.

- Q.3 Write Short answer to questions. (Any One)** **06**
- a) Explain in brief process of interview method.
 - b) Explain in brief report writing.
- Q.4 Broad Question. (Any One)** **12**
- a) What are the requirements of successful implementation of Programmes.
 - b) Explain the concept of volunteerism, role models in India, and leadership attributes required for effective volunteering.

Seat No.	
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Set **P**

B.Sc. (Plain) (सत्र - III) (नवीन) (NEP CBCS) परीक्षा: मार्च / एप्रिल - २०२६
Co-Curricular Course
National Cadet Corps (G04-CC-302)

वार, दिनांक: शनिवार, ११-०४-२०२६
वेळ: सकाळी ०९:०० ते १०:००

कमाल गुण: १५

सूचना : १) सर्व प्रश्न अनिवार्य आहेत.
२) उजवीकडील अंक पूर्ण गुण दर्शवितात.

- प्र.१ खालील दिलेले योग्य पर्याय निवडून गाळलेल्या जागा भरा. ०४
- १) — हा भारताचा सर्वोच्च नागरी सन्मान आहे.
अ) भारतरत्न ब) पद्मविभूषण
क) पद्मश्री ड) परमवीर चक्र
- २) वृक्षारोपण हा — चा एक भाग आहे.
अ) झिल ब) समाजसेवा
क) वेपन ट्रेनिंग ड) यापैकी एकही नाही
- ३) 'जय जवान, जय किसान' घोषणा — यांनी दिली.
अ) जवाहरलाल नेहरू ब) महात्मा गांधी
क) लाल बहादूर शास्त्री ड) यापैकी एकही नाही
- ४) भारतात एकूण — एन्. सी. सी. डायरेक्टरेट्स आहेत.
अ) १४ ब) १५
क) १६ ड) १७
- प्र.२ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही दोन) ०४
- अ) समाजसेवेचे उद्देश लिहा.
ब) एन्. सी. सी. मधील कॅम्पची नावे लिहा.
क) स्वच्छ भारत अभियानाची स्थापना कोणत्या वर्षी झाली.
- प्र.३ टिप लिहा. ०३
आदर्श नागरिकाचे गुण
- प्र.४ एन्. सी. सी. मध्ये केली जाणारी समाजसेवेची कामे सविस्तर लिहा. ०४
किंवा
नेतृत्वाचे मूलभूत गुण सविस्तर लिहा.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
Co-Curricular Course
National Cadet Corps (G04-CC-302)**

Day & Date: Saturday, 11-04-2026
Time: 09:00 AM To 10:00 AM

Max. Marks: 15

Instructions: 1) All questions are compulsory.
2) Right side number indicates marks.

Q.1 Choose the correct alternative from the options. 04

- 1) _____ is the highest civilian honor of India.

a) Bharat Ratna	b) Padma Vibhushan
c) Padma Shri	d) ParamVir Chakra

- 2) Tree plantation is a part of _____.

a) drill	b) weapon training
c) social service	d) None of these

- 3) _____ gave the slogan, 'Jai Jawan, Jai Kisan'.

a) Jawaharlal Nehru	b) Mahatma Gandhi
c) Lal Bahadur Shastri	d) None of these

- 4) There are _____ NCC directorates in India.

a) 14	b) 15
c) 16	d) 17

Q.2 Attempt any two of the following questions. 04

- a) Write down the aims of social service.
- b) Write down the names of camps in NCC.
- c) In which year Swachh Bharat Abhiyan was established?

Q.3 Write a short note. 03

Qualities of an Ideal citizen

Q.4 Describe the social services activity done in NCC. 04

OR

Describe the basic leadership traits.

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Set **P**

**B.Sc. (Plain) (Semester-III) (New) (NEP CBCS) Examination:
March/April - 2026
Co-Curricular Course
Sports (G04-CC-303)**

Day & Date: Saturday, 11-04-2026
Time: 09:00 AM To 10:00 AM

Max. Marks: 15

Instructions: 1) All questions are compulsory.
2) Right side number indicates marks.

Q.1 Multiple choice questions. 04

- 1) There are _____ types of competitions in athletics.
 - a) Running
 - b) Jumping
 - c) Throwing
 - d) All of above

- 2) The cloth of the Olympic flag is of _____ color.
 - a) Yellow
 - b) White
 - c) Sky Blue
 - d) Pink

- 3) In a 4 × 100 meter relay competition, a team consists of _____ players.
 - a) Three
 - b) Four
 - c) Five
 - d) Six

- 4) The five circles in the Olympic flag symbolize _____.
 - a) Five sports
 - b) Five countries
 - c) Five continents
 - d) Five sports teams

Q.2 Short Notes. (Any Three) 06

- a) Shot put
- b) Sprint (100m/200m run)
- c) Olympic competition
- d) Javelin throw

Q.3 Write the detail answer. (Any One) 05

- a) Write information about long jump.
- b) Write information with a diagram of the Olympic flag.

Seat No.	
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Set P

B.Sc. (Plain) (सत्र - III) (नवीन) (NEP CBCS) परीक्षा: मार्च / एप्रिल – २०२६
Co-Curricular Course
Health, Wellness and Fitness (G04-CC-304)

वार, दिनांक: शनिवार, ११-०४-२०२६
वेळ: सकाळी ०९:०० ते १०:००

कमाल गुण: १५

सूचना : १) सर्व प्रश्न अनिवार्य आहेत.
२) उजवीकडील अंक पूर्ण गुण दर्शवितात.

- प्र.१ योग्य पर्याय निवडून प्रश्नांची उत्तरे लिहा. ०४**
- १) खालीलपैकी कोणता घटक मानसिक आरोग्याचा भाग नाही?
अ) भावनिक स्वास्थ्य ब) बौद्धिक कार्यक्षमता
क) केसांचा रंग ड) सामाजिक संबंध
- २) कोणता घटक मानसिक आरोग्यावर नकारात्मक परिणाम करू शकतो?
अ) मजबूत सामाजिक आधार ब) दीर्घकालीन तणाव
क) नियमित व्यायाम ड) संतुलित आहार
- ३) खालीलपैकी कोणता मानसिक आरोग्य विकार आहे?
अ) मधुमेह ब) उच्च रक्तदाब
क) नैराश्य ड) दमा
- ४) फिटनेस ॲप्सचा मुख्य उद्देश काय असतो?
अ) आरोग्याचे निरीक्षण करणे ब) मोबाईलची बॅटरी वाढवणे
क) इंटरनेट स्पीड वाढवणे ड) गेम खेळणे
- प्र.२ खालील प्रश्नांची थोडक्यात उत्तरे लिहा. (कोणतेही तीन) ०६**
- अ) फिटनेस ॲप्स म्हणजे काय?
ब) ध्यान म्हणजे काय?
क) प्राथमिक उपचार म्हणजे काय?
ड) खोल श्वसन करण्याची एक पद्धत सांगा.
इ) मानसिक आरोग्य म्हणजे काय?
- प्र.३ खालील प्रश्नाचे सविस्तर उत्तर लिहा. (कोणताही एक) ०५**
- अ) तणाव म्हणजे काय? त्याची कारणे लिहा.
ब) व्यायाम करताना दुखापती होण्याची कारणे कोणती?

Seat No.	
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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
Co-Curricular Course
Health, Wellness and Fitness (G04-CC-304)**

Day & Date: Saturday, 11-04-2026
Time: 09:00 AM To 10:00 AM

Max. Marks: 15

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative from the options. 04

- 1) Which of the following is not a part of mental health?

a) Emotional well-being	b) Intellectual efficiency
c) Hair color	d) Social relationships

- 2) Which factor can negatively affect mental health?

a) Strong social support	b) Chronic stress
c) Regular exercise	d) Balanced diet

- 3) Which of the following is a mental health disorder?

a) Diabetes	b) High blood pressure
c) Depression	d) Asthma

- 4) What is the main purpose of fitness apps?

a) To monitor health	b) To increase mobile battery life
c) To boost internet speed	d) To play games

Q.2 Write Short Answers. (Any Three) 06

- a) What are fitness apps?
- b) What is meditation?
- c) What is first aid?
- d) Name one method of deep breathing.
- e) What is mental health?

Q.3 Answer the following question in detail. (Any One) 05

- a) What is stress? Write its causes.
- b) What are the causes of injuries during exercise?

Seat No.	
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Set P

B.Sc. (Plain) (सत्र - III) (नवीन) (NEP CBCS) परीक्षा: मार्च/एप्रिल - २०२६
Co-Curricular Course
Yoga Education (G04-CC-305)

वार, दिनांक: शनिवार, ११-०४-२०२६

कमाल गुण: १५

वेळ: सकाळी ०९:०० ते १०:००

सूचना : १) सर्व प्रश्न अनिवार्य आहेत.
 २) उजवीकडील अंक पूर्ण गुण दर्शवितात.

- प्र.१ खालील दिलेले योग्य पर्याय निवडून गाळलेल्या जागा भरा. ०४**
- १) आंतरराष्ट्रीय योग दिनाची सुरुवात —— वर्षी झाली.
 अ) २०१५ ब) २०१६
 क) २०१७ ड) २०१८
- २) —— या व्यक्तीने संयुक्त राष्ट्र संघात योग दिनाचे प्रस्ताव मांडले.
 अ) स्वामी विवेकानंद ब) नरेंद्र मोदी
 क) ए. पी. जे. अब्दुल कलाम ड) व्ही. पी. चंद्रशेखर
- ३) संयुक्त राष्ट्रसंघात योग दिनाच्या प्रस्तावाला —— देशांनी पाठिंबा दिला.
 अ) १७७ ब) २००
 क) २०२ ड) २५०
- ४) २१ जून या दिवसाचे तत्वज्ञानी महत्त्व स्पष्ट करा.
 अ) उत्तरायन → दक्षिणायन ब) वर्षातील मोठा दिवस
 क) वर्षातील शेवटचा दिवस ड) वरील सर्व पर्याय बरोबर आहेत
- प्र.२ खालील प्रश्नांची थोडक्यात उत्तरे लिहा. ०६**
- अ) आजच्या तणावग्रस्त जीवनशैलीत योगाचे महत्त्व थोडक्यात सांगा.
 ब) तणाव म्हणजे काय?
 क) तणाव मुक्तीसाठी कोणती दोन योगासने उपयुक्त आहेत?
- प्र.३ टिपा लिहा. (कोणतीही एक) ०५**
- अ) आधुनिक जीवनशैलीत तणावाचे स्रोत.
 ब) २१ जून या दिनाचे तत्वज्ञानाच्या दृष्टीकोनातून महत्त्व लिहा.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:
March/April – 2026
Co-Curricular Course
Yoga Education (G04-CC-305)**

Day & Date: Saturday, 11-04-2026
Time: 09:00 AM To 10:00 AM

Max. Marks: 15

Instructions: 1) All questions are compulsory.
2) Right side number indicates marks.

Q.1 Choose the correct alternative from the options. 04

- 1) International Yoga Day begins It's been _____ years.

a) 2015	b) 2016
c) 2017	d) 2018

- 2) _____ This person proposed Yoga Day at the United Nations.

a) Swami Vivekanand	b) Narendra Modi
c) A.P.J. Abdul Kalam	d) V.P. Chandrasekhar

- 3) _____ Countries supported the proposal for Yoga Day at the United Nations.

a) 177	b) 200
c) 202	d) 250

- 4) Explain the philosophical significance of the day 21st June.

a) Uttarayan → Dakshinayana	b) The biggest day of the year
c) Last day of the year	d) All of the above options They are right

Q.2 Write short answers to the following questions. 06

- a) Briefly explain the importance of yoga in today's stressful lifestyle?
- b) What is the meaning of stress?
- c) Write any two yoga possess that are useful for Stress Relief?

Q.3 Write the answers to the following questions. (Any One) 05

- a) Source of stress in modern life.
- b) Write the philosophical significance of June 21.

Seat No.	
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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
PHYSICS**

Physics in Everyday Life (G04-GE-OE-401)

Day & Date: Wednesday, 15-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat labeled diagrams wherever necessary.
4) Use of Log table and Calculator is allowed.

Q.1 Multiple choice question:**06**

- 1) _____ segment of GPS consist of receivers.
 - a) Control
 - b) User
 - c) Space
 - d) Navigation

- 2) The orbital height of GPS is _____.
 - a) 1000 km
 - b) 15000 km
 - c) 20180 km
 - d) 24280 km

- 3) All television content comes to TV set via _____.
 - a) Power signal
 - b) Odd signals
 - c) Broadcast signal
 - d) Analog signals

- 4) The material we should not use in microwave oven is _____.
 - a) Glass
 - b) Ceramic
 - c) Paper cup
 - d) Metal containers

- 5) The type of glass used to block UV rays is _____.
 - a) Soda-lime glass
 - b) Borosilicate glass
 - c) Crookes glass
 - d) Quartz glass

- 6) An engine which generates power by combustion of fuel inside the cylinder called _____.
 - a) Internal combustion engine
 - b) External combustion engine
 - c) Steam Engine
 - d) Electric Engine

Q.2 Answer the following. (Any Three)**06**

- a) What is the difference between LCD and LED?
- b) What is CCD? State use of it.
- c) What is induction stove? State use of it.
- d) What is the visible range of light? State the name of colors in visible range.
- e) State the four fundamental forces of flight.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain working mechanism of internal combustion engine.
 - b) Explain the types of lenses in detail.
 - c) Explain the working of:
 - i) Iron and
 - ii) Water heater in brief
- Q.4 Answer the following. (Any Two) 06**
- a) Explain optical recording in detail.
 - b) Describe the working principal of Microwave oven.
 - c) Write a note on GPS.
- Q.5 Answer the following. (Any One) 06**
- a) Describe working principle of LASER.
 - b) What is mechanical work? Explain the mechanics of flight.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
CHEMISTRY**

**Chemistry for Competitive Examination - II
(G04-GE-OE-402) / (G04-GE-OE-414) / (G04-GE-OE-415)**

Day & Date: Wednesday, 15-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagram and give equations wherever necessary.

Q.1 Choose the correct alternatives. 06

- 1) Elements belonging to the same group in the modern periodic table have the same _____.
 - a) Number of shells
 - b) Atomic size
 - c) Number of valence electrons
 - d) Atomic mass

- 2) Which noble gas is commonly used in electric bulbs due to its inert nature?

a) Helium	b) Neon
c) Argon	d) Krypton

- 3) Which of the following is a physical property of metals?

a) Brittle nature	b) Ductility
c) Poor conductor of heat	d) Low melting point

- 4) _____ is an example of a strong acid.

a) Acetic acid	b) Carbonic acid
c) Formic acid	d) Hydrochloric acid

- 5) Which factor increases the rate of a chemical reaction by lowering activation energy?

a) Temperature	b) Concentration
c) Particle size	d) Catalyst

- 6) Oxidation is defined as _____.

a) Gain of electrons	b) Loss of electrons
c) Gain of hydrogen	d) Loss of oxygen

- Q.2 Answer the following. (Any Three) 06**
- a) On what basis did Mendeleev classify elements in his periodic table?
 - b) State any two physical properties of metals.
 - c) What are salts?
 - d) What is an endothermic reaction?
 - e) State any two factors affecting the rate of a reaction.
- Q.3 Answer the following. (Any Two) 06**
- a) State Newlands' law of octaves. Mention any two limitations of this law.
 - b) What is metallurgy? Explain the steps involved in extraction of metals from their ores.
 - c) Explain Dobereiner's triads. State the law and give one suitable example.
- Q.4 Answer the following. (Any Two) 06**
- a) Differentiate between strong and weak acids. (any two points)
 - b) What is meant by rate of reaction? Explain any two factors affecting the rate of a chemical reaction.
 - c) Explain Arrhenius theory of acids and bases. Give one example each of an Arrhenius acid and an Arrhenius base.
- Q.5 Answer the following. (Any One) 06**
- a) Explain periodic trends with respect to atomic size, ionization energy, and electronegativity. Discuss their variation along a period and down a group.
 - b) Define chemical reaction. Explain the writing of chemical reactions with suitable examples and balanced equations.

- Q.2 Answer the following. (Any Three) 06**
- a) Define Tenor.
 - b) Name the earth resources.
 - c) What is the classification of energy?
 - d) Give the examples of ferrous minerals.
 - e) List the resources of oil and natural gas.
- Q.3 Answer the following. (Any Two) 06**
- a) Explain how magmatic segregation concentrates ores such as chromium.
 - b) Discuss the advantages of artificial recharge structures.
 - c) Describe the environment dimension of energy.
- Q.4 Answer the following. (Any Two) 06**
- a) Write the short note on Conventional and nonconventional energy source.
 - b) Explain in brief the rainwater harvesting technique.
 - c) Discuss the mineral deposits formed by hydrothermal fluids.
- Q.5 Answer the following. (Any One) 06**
- a) Define fossil fuel. Explain the origin and distribution of coal.
 - b) Describe the groundwater management strategies.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
BOTANY**

Analytical Techniques in Plant Science (G04-GE-OE-403)

Day & Date: Wednesday, 15-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.

06

- 1) _____ microscopy technique is used to obtain a topographical (3D) image of a sample.
 - a) Light
 - b) Fluorescence
 - c) Scanning electron
 - d) Transmission electron

- 2) Fluorescence microscopy is mainly used to _____.
 - a) Observe surface topography in 3D
 - b) Visualize specific cellular components using fluorescent dyes
 - c) Study internal ultrastructure of cells at atomic resolution
 - d) Observe living cells without staining

- 3) _____ centrifuge is most suitable for separating cell debris from plant extracts after homogenization.
 - a) Ultracentrifuge
 - b) Microcentrifuge
 - c) Low-speed centrifuge
 - d) Analytical ultracentrifuge

- 4) Paper chromatography is mainly used for the separation and analysis of _____.
 - a) Proteins
 - b) DNA
 - c) Plant pigments and amino acids
 - d) Lipoproteins

- 5) The first step in protein purification generally involves _____.
 - a) Cell disruption and extraction
 - b) Chromatography
 - c) Dialysis
 - d) Electrophoresis

- 6) The DNA in aqueous solution is precipitated using _____.
 - a) Acetone
 - b) Ethanol or Isopropanol
 - c) Methanol
 - d) Chloroform

- Q.2 Answer the following. (Any Three) 06**
- a) Enlist the types of chromatography.
 - b) What is light microscopy?
 - c) Define PAGE.
 - d) Define centrifugation.
 - e) What is the purpose of cell lysis in DNA isolation?
- Q.3 Answer the following. (Any Two) 06**
- a) Any two principles of chromatography.
 - b) Describe structure of electron microscopes.
 - c) Differentiate between sedimentation and centrifugation (any two points).
- Q.4 Answer the following. (Any Two) 06**
- a) Explain Scanning electron microscopy.
 - b) Describe isolation of DNA.
 - c) Write on isolation of proteins.
- Q.5 Answer the following. (Any One) 06**
- a) Enlist different types of centrifuges. Describe any one type of centrifuge.
 - b) Explain the steps involved in Thin Layer Chromatography. Add advantages and limitations.

Seat No.	
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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
ZOOLOGY**

Wild Life Photography (G04-GE-OE-404)

Day & Date: Wednesday, 15-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.

06

- 1) Wildlife photography mainly focuses on _____.
 - a) Studio portraits
 - b) Nature landscapes
 - c) Animals in their natural habitat
 - d) Urban life

- 2) _____ is most commonly used in wildlife photography.

a) Macro lens	b) Standard lens
c) Wide angle lens	d) Telephoto lens

- 3) _____ time of day is best for wildlife photography.
 - a) Early morning & late evening
 - b) Midday
 - c) Late night
 - d) Afternoon

- 4) Which camera setting helps freeze fast moving animals?

a) Slow shutter speed	b) High ISO
c) Fast shutter speed	d) Low aperture

- 5) Ethical wildlife photography means _____.
 - a) Feeding animals to attract them
 - b) Disturbing animals for better shots
 - c) Respecting animals and their habitat
 - d) Using flash close to animals

- 6) A tripod in wildlife photography is mainly used to _____.

a) Increase zoom	b) Stabilize the camera
c) Improve color	d) Reduce ISO

- Q.2 Answer the following. (Any Three) 06**
- a) Define Flash unit.
 - b) What is filter?
 - c) Enlist optional accessories for camera.
 - d) Importance of tripod stand
 - e) What is coral draw?
- Q.3 Answer the following. (Any Two) 06**
- a) Explain the brief history of photography.
 - b) Enlist the different types of photographic cameras.
 - c) Enlist the career opportunities in wild life photography.
- Q.4 Answer the following. (Any Two) 06**
- a) What are the different types of lenses? Describe their uses.
 - b) What is Photo Editing? Explain the role and installation of various photo editing software's.
 - c) What is the significance of ISO? Comment on correct focus and suitable white balance using ISO.
- Q.5 Answer the following. (Any One) 06**
- a) What is importance of wildlife photography? Comment on ethics of wildlife photography.
 - b) What is Video Editing? Explain the role and installation of various video editing software's.

Seat No.	
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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
MATHEMATICS
Finite Automata and Theory of Equation (G04-GE-OE-410)**

Day & Date: Wednesday, 15-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Q.1 Select the correct alternative for each of the following.**06**

- 1) A tree with n vertices has _____ edges.
 - a) $n + 1$
 - b) $n - 1$
 - c) n
 - d) n^2

- 2) In finite Automata M is designated as $M = \langle A, S, T, q_0, f \rangle$ where finite set ' S ' is called _____.
 - a) input symbol
 - b) internal state
 - c) initial state
 - d) accepting state

- 3) If $e = (u, v)$ is an edge in digraph then u is called as _____.
 - a) Isolated vertex
 - b) Terminal vertex
 - c) Initial vertex
 - d) All of above

- 4) One root of equation $x^3 - 6x^2 + 11x - 6 = 0$ is _____.
 - a) 2
 - b) 4
 - c) 6
 - d) -1

- 5) In quadratic equation $a_0x^2 + a_1x + a_2 = 0$, if α_1, α_2 are its roots then product of $\alpha_1 \cdot \alpha_2 =$ _____.
 - a) $\frac{a_1}{a_0}$
 - b) $\frac{-a_1}{a_0}$
 - c) $\frac{a_2}{a_0}$
 - d) $\frac{a_0}{a_2}$

- 6) How many real roots for equation $x^6 + x^4 - x^3 - 2x - 1 = 0$ _____.
 - a) 1
 - b) 3
 - c) 2
 - d) 4

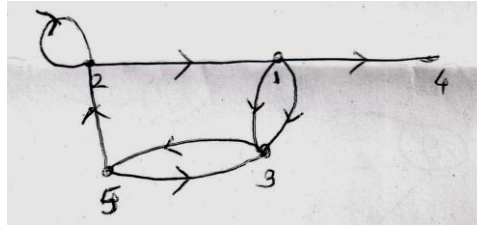
Q.2 Answer the following. (Any Three)**06**

- a) Draw all rooted trees with four vertices.
- b) Define finite state machine.
- c) Define strongly connected graph also draw a figure.
- d) Find the quotient and remainder when the polynomial.
 $2x^4 - 6x^3 + 7x^2 - 5x + 1$ is divided by $(x + 2)$
- e) Change the sign of the roots of the equation.
 $x^7 - 7x^6 - 3x^4 + 4x^2 - 3x - 2 = 0$

Q.3 Answer the following. (Any Two)

06

a) Find adjacency matrix of given digraph.



b) Find prefix and postfix form of given infix form

i) $(a + b).c$

ii) d/e

iii) $[(a + b).c] - (d/e)$

c) Solve the equation $32x^3 - 48x^2 + 22x - 3 = 0$ the roots being in A.P.

Q.4 Answer the following. (Any Two)

06

a) For state table draw the state graph.

f, g	a	b
q_0	q_1x	q_0y
q_1	q_2z	q_3z
q_2	q_3z	q_1y
q_3	q_1x	q_0z

b) Factorize into linear factors the polynomial $x^3 - 1$

c) If a polynomial $f(x)$ is divided by a linear polynomial $(x - c)$ then show that remainder is $f(c)$.

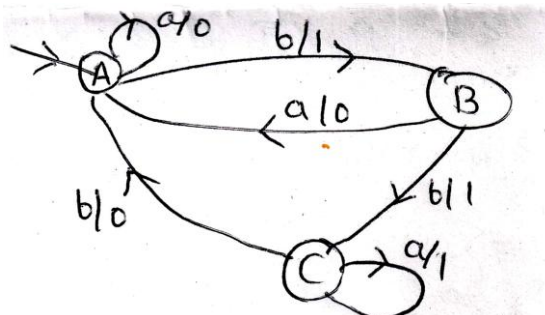
Q.5 Answer the following. (Any One)

06

a) Find the equation whose roots are of equation

$2x^5 - 2x^4 + 3x^3 - 2x^2 - x - 5 = 0$ decrease by 2 by Horner's method.

b) Find the sets A, S, Z the initial state and the table defining the next state and output function for finite state machine.



Also find output string for $aabbabaab$.

Seat No.	
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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
STATISTICS
Applications of Statistics (G04-GE-OE-411)**

Day & Date: Wednesday, 15-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of Calculator is allowed.

Q.1 Choose the correct alternatives.**06**

- 1) The eyes colour of 50 women is _____.
a) discrete variable b) continuous variable
c) constant d) attribute
- 2) With the three attributes A, B and C , the number of second order classes is _____.
a) 6 b) 9
c) 12 d) None of the above
- 3) If for two attributes A and B , relation $(AB)(\alpha\beta) = (A\beta)(\alpha\beta)$ holds good then, the attributes A and B are _____.
a) positively associated b) completely associated
c) completely disassociated d) independent
- 4) Index number is always expressed in _____.
a) percentage b) ratio
c) proportion d) None of the above
- 5) In Laspeyres price index number weight is considered as _____.
a) quantity in base year b) quantity during current year
c) prices in base year d) prices in current year
- 6) Which of the following formula satisfy the time reversal test?
a) Laspeyres b) Paasche's
c) Fishers d) None of the above

Q.2 Answer the following. (Any Three)**06**

- a) Define Yule's coefficient of association and coefficient of colligation.
- b) Define positive class frequency and negative class frequency.
- c) Define the term attribute and ultimate class frequencies.
- d) Define Paasche's price index number.
- e) What is index number?

- Q.3 Answer the following. (Any Two) 06**
- a) State any two fundamental sets of class frequencies if the data contains three attributes A, B and C .
 - b) Define index number and state the features of it.
 - c) Find the number of attributes ' n ' if total number of class frequencies of order 2 is 180 and the population is dichotomized according to n attributes.
- Q.4 Answer the following. (Any Two) 06**
- a) If $(A) = (B) = \frac{N}{2}$, then show that $(AB) = (\alpha\beta)$ and $(A\beta) = (\alpha\beta)$
 - b) Explain the weighted aggregate method of calculating index number.
 - c) Write a note on cost of living index number.
- Q.5 Answer the following. (Any One) 06**
- a) Find the conditions of consistency of data related to three attributes A, B and C .
 - b) What is time reversal test? Verify the same for Paasche's index number.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
COMPUTER SCIENCE
Fundamentals Data Communication and Network Systems
(G04-GE-OE-408)**

Day & Date: Wednesday, 15-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.**06**

- 1) ACK stands for _____.
 - a) Acknowledge
 - b) Access Key
 - c) Automatic Key
 - d) Advanced Knowledge
- 2) CRC is mainly used for _____.
 - a) Error correction
 - b) Error detection
 - c) Flow control
 - d) Framing
- 3) Which medium is most secure?
 - a) Radio waves
 - b) Twisted pair
 - c) Fiber optic
 - d) Microwave
- 4) Noise is _____.
 - a) Useful signal
 - b) Distortion
 - c) Unwanted signal
 - d) Attenuation
- 5) MAC address is _____.
 - a) Logical address
 - b) Physical address
 - c) Network address
 - d) Application address
- 6) Nyquist theorem gives _____.
 - a) Channel capacity
 - b) Maximum bit rate
 - c) Noise ratio
 - d) Signal power

Q.2 Answer the following. (Any Three)**06**

- a) What is Manchester coding?
- b) Define bit rate and baud rate.
- c) What is RARP?
- d) What are the functions of Session layer?
- e) What is a burst error?

- Q.3 Answer the following. (Any Two) 06**
- a) Explain modulation and its types (AM, FM, PM).
 - b) Explain types of transmission errors.
 - c) Explain network devices: Hub, Switch and Router
- Q.4 Answer the following. (Any Two) 06**
- a) Explain UDP and its features.
 - b) Explain types of transmission errors.
 - c) Explain Pulse Code Modulation (PCM).
- Q.5 Answer the following. (Any One) 06**
- a) Explain the TCP/IP Reference Model and compare it with the OSI model.
 - b) Explain CSMA/CD and CSMA/CA with working.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
ELECTRONICS**

Electronic Waste Management and Sustainability (G04-GE-OE-405)

Day & Date: Wednesday, 15-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives. 06

- 1) E-waste mainly consists of discarded _____.
 - a) Food materials
 - b) Electronic and electrical equipment
 - c) Plastic toys
 - d) Paper waste
- 2) _____ of the following is a hazardous material found in e-waste.
 - a) Gold
 - b) Silver
 - c) Lead
 - d) Copper
- 3) Informal recycling of e-waste may cause _____.
 - a) Improved air quality
 - b) Soil and water pollution
 - c) Increase in forest cover
 - d) Noise reduction
- 4) Incineration of e-waste leads to release of _____.
 - a) Oxygen
 - b) Nitrogen
 - c) Toxic gases
 - d) Steam
- 5) Mechanical recycling process mainly involves _____.
 - a) Burning
 - b) Shredding and separation
 - c) Chemical washing
 - d) Composting
- 6) Recovery of precious metals from e-waste includes extraction of _____.
 - a) Sand
 - b) Plastic
 - c) Gold
 - d) Rubber

Q.2 Answer the following. (Any Three) 06

- a) Define e-waste and explain its classification.
- b) which are sources of e-waste.
- c) Give environmental impacts of e-waste.
- d) which are the health risks to informal workers.
- e) Which are collection and segregation process of e-waste.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain composition of e-waste (hazardous and valuable materials).
 - b) Explain pollution caused by landfilling of e-waste.
 - c) Explain chemical recycling process.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain thermal recycling method.
 - b) Explain safe handling and disposal methods of e-waste.
 - c) Explain dismantling process in e-waste management.
- Q.5 Answer the following. (Any One) 06**
- a) Discuss e-waste management techniques in detail.
 - b) Discuss environmental and health impacts of e-waste with suitable examples.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
MICROBIOLOGY
Fermentation Technology (G04-GE-OE-406)**

Day & Date: Wednesday, 15-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.**06**

- 1) _____ is the result of the mashing process.
 - a) Finished beer
 - b) Wort
 - c) Malted barley
 - d) Spent grain
- 2) _____ micro-organism is mainly used for preparation of Curd.
 - a) *E. coli*
 - b) *Mycobacterium*
 - c) *Bacillus*
 - d) *Lactobacillus*
- 3) Wine making process, the sugar required is derived from _____.
 - a) Sugarcane
 - b) Molasses
 - c) Grapes
 - d) Invertase
- 4) _____ is primarily used in alcoholic fermentation to produce beer.
 - a) *Lactobacillus*
 - b) *Saccharomyces cerevisiae*
 - c) *Acetobacter*
 - d) *Streptococcus*
- 5) _____ is commonly used for coagulation in paneer production.
 - a) Citric acid/Lemon juice
 - b) Hydrochloric acid
 - c) Rennet
 - d) Sulfuric acid
- 6) _____ is the by-product of cheese manufacturing.
 - a) Skim milk
 - b) Cream
 - c) Whey
 - d) Butter

Q.2 Answer the following. (Any Three)**06**

- a) Enlist dairy products.
- b) What is must?
- c) Write two benefits of consumption of probiotics.
- d) Enlist alcoholic beverages.
- e) Name two microbial culture used in yogurt production.

- Q.3 Answer the following. (Any Two) 06**
- a) Define fermentation and explain fermented food products bread.
 - b) Write composition of milk.
 - c) Explain spoilage of wine.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain in production of champagne.
 - b) Write a note on types of beer.
 - c) Define Pasteurization and describe methods of pasteurization.
- Q.5 Answer the following. (Any One) 06**
- a) Explain in detail production of wine.
 - b) Describe in detail fermented food products Idli.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
GEOGRAPHY
Resource Geography of Maharashtra (G04-GE-OE-407)**

Day & Date: Wednesday, 15-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat labeled diagrams wherever necessary.
3) Use of Stencils is allowed.

Q.1 Multiple choice questions.**06**

- 1) _____ type of forest is mainly found in Vidarbha region.
 - a) Mangrove
 - b) Evergreen
 - c) Deciduous
 - d) Thorny
- 2) _____ is a biotic resource.
 - a) Plants
 - b) Bauxite
 - c) Iron ore
 - d) Petroleum
- 3) Fisheries come under the _____ type of resource.
 - a) Abiotic
 - b) Human
 - c) Biotic
 - d) Non-renewable
- 4) Population becomes a valuable resource when it is _____.
 - a) Large
 - b) Educated and skilled
 - c) Poor
 - d) Unhealthy
- 5) Improvement in human resource is called _____.
 - a) Conservation
 - b) Human Development
 - c) Industrialization
 - d) Urbanization
- 6) People moving from villages to cities is known as _____.
 - a) Growth
 - b) Distribution
 - c) Density
 - d) Migration

Q.2 Answer the following. (Any Three)**06**

- a) Define the biotic resources.
- b) What is a fishery?
- c) What is Optimum population?
- d) What is resource?
- e) Define forest conservation?

- Q.3 Answer the following. (Any Two) 06**
- a) Importance of forest
 - b) Human Resource development in Maharashtra
 - c) Role of fisheries in economic development of Maharashtra
- Q.4 Answer the following. (Any Two) 06**
- a) Explain the types of forest in Maharashtra.
 - b) Explain the types of Fisheries.
 - c) Describe the causes of population migration in Maharashtra.
- Q.5 Answer the following. (Any One) 06**
- a) Explain the causes of population growth in Maharashtra.
 - b) Describe the need of forest conservation.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
ENVIRONMENTAL SCIENCE
Wild Life Conservation and Management (G04-GE-OE-412)**

Day & Date: Wednesday, 15-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative. (MCQ) 06

- 1) Wildlife conservation mainly aims to _____.
 - a) Increase pollution
 - b) Protect species
 - c) Destroy habitats
 - d) Increase urbanization
- 2) Biodiversity refers to _____.
 - a) Only plants
 - b) Only animals
 - c) Variety of life forms
 - d) Only microbes
- 3) National parks are example of _____.
 - a) Ex-situ conservation
 - b) In-situ conservation
 - c) Artificial conservation
 - d) None
- 4) Gene banks are used for _____.
 - a) Storing money
 - b) Storing genetic material
 - c) Hunting animals
 - d) Tourism
- 5) Wetlands are important for _____.
 - a) Desert formation
 - b) Water storage & biodiversity
 - c) Mining
 - d) Urbanization
- 6) Grasslands mainly support _____.
 - a) Aquatic animals
 - b) Herbivores
 - c) Birds only
 - d) None

Q.2 Answer the following questions. (Any Three) 06

- a) Define habitat destruction. Give one example.
- b) Name any four national parks in India.
- c) Discuss keystone species.
- d) Describe in-situ conservation.
- e) Write impacts of climate change.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain wildlife conservation in detail.
 - b) Write a short note on biodiversity and its importance.
 - c) Discuss role of zoos in conservation.
- Q.4 Answer the following questions. (Any Two) 06**
- a) What is wildlife census? Write its process.
 - b) Explain human wildlife conflict in detail.
 - c) Write advantages of eco-tourism.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain in detail Wildlife Protection Act 1972.
 - b) Describe in detail ex-situ and in-situ conservation methods.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
PLANT PROTECTION
Analytical Techniques in Plant Sciences (G04-GE-OE-413)**

Day & Date: Wednesday, 15-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw a well diagram wherever necessary.
3) All question carries equal marks.

Q.1 Choose the correct alternatives.**06**

- 1) Which microscope is suitable for observing living cells?
 - a) TEM
 - b) SEM
 - c) Phase contrast microscope
 - d) Electron microscope
- 2) Resolution of electron microscope is higher because it uses _____.
 - a) Light waves
 - b) Sound waves
 - c) X-rays
 - d) Electron beams
- 3) Which force is responsible for separation in centrifugation?
 - a) Gravitational force
 - b) Magnetic force
 - c) Centrifugal force
 - d) Frictional force
- 4) Which gradient is commonly used in density gradient centrifugation?
 - a) Agarose
 - b) Polyacrylamide
 - c) Sucrose
 - d) Cellulose
- 5) TLC plates are generally coated with _____.
 - a) Agar
 - b) Cellulose
 - c) Silica gel
 - d) Sephadex
- 6) Which PAGE is used for native proteins?
 - a) SDS-PAGE
 - b) Agarose PAGE
 - c) Native PAGE
 - d) Urea PAGE

Q.2 Answer the following. (Any Three)**06**

- a) What is resolution in microscopy?
- b) Define centrifugation.
- c) State two applications of chromatography.
- d) What is DNA precipitation?
- e) Name two types of centrifuges.

- Q.3 Answer the following. (Any Two) 06**
- a) Write a short note on Fluorescence microscopy.
 - b) Explain principle of sedimentation.
 - c) Describe protein estimation by Bradford method.
- Q.4 Answer the following. (Any Two) 06**
- a) Write a note on Analytical ultracentrifugation.
 - b) Explain Thin Layer Chromatography (TLC).
 - c) Write a short note on RNA isolation
- Q.5 Answer the following. (Any One) 06**
- a) Explain Light microscopy with principle, types and applications.
 - b) Describe DNA isolation with steps and applications.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
ENGLISH
Reading Texts in Indian English - II (G04-ENG-401)**

Day & Date: Thursday, 16-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative.**06**

- 1) What is India's true strength according to Tagore?
 - a) Military power
 - b) Economic growth
 - c) Spiritual wisdom
 - d) Political influence
- 2) What is the central idea of the essay?
 - a) Scientific progress
 - b) Unity of thought and purpose
 - c) Political power
 - d) Economic growth
- 3) Sudha Murthy was the first woman engineer at _____.
 - a) ISRO
 - b) Infosys
 - c) BHEL
 - d) TELCO
- 4) The tone of the poem Hunger is _____.
 - a) Humorous
 - b) Romantic
 - c) Tragic
 - d) Playful
- 5) Sunrise symbolizes _____.
 - a) Fear
 - b) Death
 - c) Hope
 - d) Anger
- 6) The "house" in the poem The House of My Childhood symbolizes _____.
 - a) Wealth
 - b) Power
 - c) Fear
 - d) Emotional security

Q.2 Write Short Answers. (Any Two)**06**

- a) How is nature connected to human life in the poem Sunrise?
- b) What kind of hunger is shown in the poem?
- c) Why does Tagore criticize nationalism?
- d) What was Sudha Murthy's achievement in the engineering field?

Q.3 Write short answers. **06**

The central idea of the poem The House of My Childhood by Dilip Chitre.

Q.4 Write the detail answer. (Any One) **12**

- a) Who is Sudha Murthy? What is the role of Infosys Foundation?
- b) Elaborate the central theme of the 'Essay Unity of Mind' by A. P. J. Abdul Kalam and his vision of developed nation.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
PHYSICS - V
Optics (G04-DSC1-0401)**

Day & Date: Friday, 17-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of log table or calculator is allowed.
4) Draw neat diagrams and give equations wherever necessary.

Q.1 Choose correct alternative for each of the following. 06

- 1) The blurring of image due to lenses or mirrors of large aperture is called _____ aberrations.

a) spherical	b) chromatic
c) lateral chromatic	d) longitudinal chromatic

- 2) When a ray of light gets reflected from the surface of a denser medium, then additional path difference introduced is _____.

a) $\frac{\lambda}{2}$	b) λ
c) $\frac{3\lambda}{2}$	d) $\frac{\lambda}{4}$

- 3) The phenomenon of diffraction is explained on the basis of _____.
 - a) Fermat's principle
 - b) rectilinear propagation of light
 - c) Huygen's theory of secondary wavelets
 - d) Newton's corpuscular theory

- 4) In half wave plate the path difference produced between E-ray and O-ray is _____.

a) λ	b) $\frac{\lambda}{2}$
c) $\frac{\lambda}{4}$	d) $\frac{\lambda}{3}$

- 5) The ray having same velocity in all directions in the crystal is _____.
 - a) normal ray
 - b) ordinary ray
 - c) extraordinary ray
 - d) both ordinary and extraordinary ray

- 6) The spherical aberration of convex lens is _____.
a) Positive
b) Negative
c) positive as well as negative
d) none of these

Q.2 Answer the following questions. (Any Three) 06

- a) Define Chromatic aberration.
b) What are the conditions of interference of light.
c) Define Rayleigh's criteria for limit of resolution.
d) State Brewster's law.
e) State cardinal points.

Q.3 Answer the following questions. (Any Two) 06

- a) Prove that the angle of incident is equal to the angle of reflection on Fermat's principle.
b) In a newton's rings experiment, the diameters of 6th and 16th rings were measured to be 3.35×10^{-3} m and 6×10^{-3} m respectively. If the radius of curvature of the planoconvex lens is 100cm, calculate the wavelength of the light used.
c) Explain Fresnel's half period zones.

Q.4 Answer the following questions. (Any Two) 06

- a) Explain the methods of minimizing spherical aberration.
b) What should be the minimum number of lines in plane diffraction grating which will just resolve the lines of wavelengths 5890 \AA and 5896 \AA , in the second order of the spectrum?
c) Explain the difference between Geometrical and spectral resolution.

Q.5 Answer the following question. (Any One) 06

- a) Explain the principle, construction and working of Nicol Prism.
b) Obtain an expression for the band width of the interference fringes due to reflected light in case of a wedge shaped film.

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Set **P**

B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April- 2026
CHEMISTRY – V
Physical Chemistry (G04-DSC1-0403)

Day & Date: Friday, 17-04-2026
 Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
 2) Draw neat diagram and give equations wherever necessary.
 3) Figures to the right indicate full marks.

Q.1 Choose correct alternative.**06**

- 1) If transport number of K^+ is 0.49, then that of Cl^- is _____.
 - a) 0.49
 - b) 0.51
 - c) 0.049
 - d) 0.051
- 2) When a solid melts to liquid, entropy _____.
 - a) decreases
 - b) remains constant
 - c) increases
 - d) None of these
- 3) The number of atoms in simple cubic unit cells are _____.
 - a) 1
 - b) 2
 - c) 4
 - d) 6
- 4) The unit cell of NaCl crystal lattice is _____.
 - a) FCC
 - b) BCC
 - c) simple cubic
 - d) None of these
- 5) Which of the following salt is a sparingly soluble salt?
 - a) AgCl
 - b) $BaSO_4$
 - c) PbI_2
 - d) All of these
- 6) Equivalent conductivity value _____ on dilution.
 - a) increases
 - b) decreases
 - c) remains unaltered
 - d) approaches to zero

Q.2 Answer the following questions. (Any Three)**06**

- a) Define the term equivalent conductance. Mention its unit.
- b) State law of constancy of interfacial angles.
- c) Define entropy.
- d) What is meant by unit cell of a crystal?
- e) State Kohlrausch's law.

Q.3 Answer the following questions. (Any Two) 06

- a) Explain the mode of conduction in electronic and electrolytic conductors.
- b) Write a note on Miller and Weiss indices.
- c) Derive the expression for entropy change involved in mixing of gases.

Q.4 Answer the following questions. (Any Two) 06

- a) In the moving boundary experiment with 0.025 N solution of NaCl, using CdCl₂ solution as the indicator a current of 1.6 ampere was passed through a tube of uniform cross section of 1.1 cm². The time taken for the boundary to travel a distance of 7.0 cm was 25 seconds. Calculate the transport number of Na⁺ ion.
- b) Discuss the application of Kohlrausch's law in determination of ionic product of water.
- c) Derive Bragg's X-ray diffraction equation.

Q.5 Answer the following question. (Any One) 06

- a) Describe how the absolute entropy can be calculated using third law of thermodynamics.
- b) Define transport number. Explain the factors affecting transport number.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
CHEMISTRY - V
Inorganic Chemistry (G04-DSC1-0425)/(G04-DSC1-0427)**

Day & Date: Friday, 17-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative from the options. (MCQ) 06

- 1) According to Werner's Coordination theory, the secondary valency of a metal ion is satisfied by _____ ions/atoms.
 - a) negative
 - b) positive
 - c) neutral
 - d) All of these
- 2) Geometrical isomerism is also called _____ Isomerism.
 - a) structural
 - b) optical
 - c) cis-trans
 - d) dl
- 3) _____ is an ambidentate ligand.
 - a) ammine
 - b) aqua
 - c) oxalato
 - d) thiocyanato
- 4) EDTA is a _____ dentate chelating agent.
 - a) mono
 - b) tri
 - c) bi
 - d) hexa
- 5) d-block elements are also called _____ elements.
 - a) alkali
 - b) alkaline earth
 - c) transition
 - d) inner transition
- 6) For the production of ammonia _____ is used as a catalyst.
 - a) Pt
 - b) Ni
 - c) V_2O_5
 - d) Fe

Q.2 Answer the following questions. (Any Three) 06

- a) What is coordinate bond? Give a suitable example.
- b) Define:
 - i) ligand
 - ii) coordination number
- c) Write down the IUPAC name for complex $K_4[Fe(CN)_6]$.
- d) What are chelating agents? Explain its types.
- e) What are d-block elements? Give their position in the periodic table.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Write down the postulates of Werner's coordination theory.
 - b) Explain the structural requirement for chelate formation.
 - c) Explain the oxidation state of the first transition series elements.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Discuss the geometrical isomerism for complexes with coordination number (CN=4).
 - b) Give the applications of EDTA as a chelating agent.
 - c) Explain with suitable example metal chelate and metal complex?
- Q.5 Answer the following question. (Any One) 06**
- a) Give the postulates of VBT and explain the formation of $[\text{Fe}(\text{CN})_6]^{3+}$ complex according to VBT.
 - b) Write down the name, symbol, atomic number, and observed electronic configuration of 3d block/ first transition series elements.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
BOTANY – V
Plant Physiology (G04-DSC1-0405)**

Day & Date: Friday, 17-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative.**06**

- 1) _____ is the hormone responsible for flowering.
 - a) Vernalin
 - b) Cytokinin
 - c) aminobutyric acid
 - d) Florigen
- 2) The process of movement of food through the phloem is called _____.
 - a) Transpiration
 - b) Translocation
 - c) Photosynthesis
 - d) Respiration
- 3) _____ organelle is responsible for photosynthesis.
 - a) Mitochondria
 - b) Golgi apparatus
 - c) Chloroplast
 - d) Ribosome
- 4) _____ are the two main stages of photosynthesis.
 - a) Light Reaction and Dark Reaction
 - b) Glycolysis and Krebs Cycle
 - c) Electron Transport Chain and ATP Synthesis
 - d) Aerobic and Anaerobic Phases
- 5) Kreb cycle occur in _____.
 - a) Chloroplast
 - b) Mitochondria
 - c) Cytoplasm
 - d) Ribosome
- 6) The correct sequence of cell organelles during photorespiration is _____.
 - a) Chloroplast → Peroxisome → Mitochondria
 - b) Chloroplast → Mitochondria → Peroxisome
 - c) Peroxisome → Chloroplast → Mitochondria
 - d) Mitochondria → Peroxisome → Chloroplast

Q.2 Answer the following questions. (Any Three)**06**

- a) Define Photoperiodism.
- b) What is phloem unloading?
- c) Define C₃ plants.
- d) What is aerobic respiration?
- e) Give any two significance of photorespiration.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Short day plants (SDP).
 - b) Source- sink relation during vegetative phase.
 - c) Define anaerobic respiration.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain apoplastic transport.
 - b) Describe Structure of chloroplast.
 - c) Write note on photorespiration.
- Q.5 Answer the following question. (Any One) 06**
- a) Describe noncyclic photophosphorylation.
 - b) Write an essay on TCA cycle.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
ZOOLOGY - V
Principles of Ecology (G04-DSC1-0407)**

Day & Date: Friday, 17-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat labelled diagram wherever necessary.

Q.1 Choose the correct alternatives. (MCQ)

06

- 1) Autecology deals with the study of _____.
 - a) Community
 - b) Ecosystem
 - c) Individual species
 - d) Population
- 2) Natality refers to _____.
 - a) Death rate
 - b) Birth rate
 - c) Migration rate
 - d) Growth curve
- 3) Groupism and social behaviour are examples of _____.
 - a) Interspecific association
 - b) Parasitism
 - c) Intraspecific association
 - d) Mutualism
- 4) Which of the following is a lentic freshwater ecosystem?
 - a) River
 - b) Stream
 - c) Lake
 - d) Canal
- 5) Food web represents _____.
 - a) Single feeding relationship
 - b) Linear food chain
 - c) Interconnected food chains
 - d) Energy loss only
- 6) Biodiversity hotspots are characterized by _____.
 - a) Low endemism
 - b) High species richness and threat
 - c) Uniform species distribution
 - d) Absence of human impact

Q.2 Answer the following. (Any Three)

06

- a) Define ecology and state its scope.
- b) Define population density and mortality.
- c) What is mutualism? Give one example.
- d) Write a note on temperature as an abiotic factor.
- e) Define species richness and species dominance.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain survivorship curves in population ecology.
 - b) Describe courtship behaviour in birds as an intraspecific association.
 - c) Write a short note on freshwater ecosystems: lotic and lentic.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain community characteristics with reference to diversity indices.
 - b) Describe energy flow in an ecosystem with reference to trophic levels.
 - c) Write a note on biogeochemical cycle of nitrogen.
- Q.5 Answer the following. (Any One) 06**
- a) Describe grassland and desert ecosystems with special reference to faunal adaptations.
 - b) Write an essay on biodiversity hotspots and sacred groves in India, highlighting the importance of conservation and human impacts on biodiversity.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April- 2026
ELECTRONICS – V
Electronics Circuits (G04-DSC1-0409)**

Day & Date: Friday, 17-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:**
- 1) All questions are compulsory.
 - 2) Draw neat diagrams and give equations wherever necessary.
 - 3) Figures to the right indicate full marks.
 - 4) Use of logarithmic table and scientific calculator is allowed.

Q.1 Choose correct alternative.

06

- 1) Applying dc supply of proper polarity and magnitude is called as _____.
 - a) amplification
 - b) rectification
 - c) filtration
 - d) biasing

- 2) When BJT is used as an amplifier then its EB junction is _____ bias and CB junction is _____ bias.
 - a) forward, forward
 - b) reverse, forward
 - c) forward, reverse
 - d) reverse, reverse

- 3) In _____ the output voltage depends on the difference between the two input voltages.
 - a) power amplifier
 - b) differential amplifier
 - c) voltage amplifier
 - d) multistage amplifier

- 4) Another name for positive feedback is _____.
 - a) regenerative
 - b) degenerative
 - c) generative
 - d) reductive

- 5) The Barkhausen criteria for producing sinusoidal oscillations is _____.
 - a) $\beta \cdot A_v < 1$
 - b) $\beta \cdot A_v = 0$
 - c) $\beta \cdot A_v = 1$
 - d) $\beta \cdot A_v > 1$

- 6) In Phase shift oscillator each RC network introduces _____ degree phase shift.
 - a) 360
 - b) 90
 - c) 180
 - d) 60

- Q.2 Answer the following questions. (Any Three) 06**
- a) In a Wien Bridge oscillator if $R_1, R_2 = 10\text{ K}\Omega$ and $C_1, C_2 = 15\text{ pF}$. Calculate the frequency of oscillation.
 - b) State the advantages of the negative feedback.
 - c) Define:
 - i) Differential mode gain
 - ii) CMRR
 - d) Calculate the total gain with and without decibels of a multi-stage amplifier whose individual stage gains are 2, 3, and 5.
 - e) Enlist different methods of transistor biasing.
- Q.3 Answer the following. (Any Two) 06**
- a) State the features of Class-A power amplifier.
 - b) Explain the basic action of transistor as an amplifier.
 - c) Draw the circuit diagram of Colpitt's oscillator using BJT.
- Q.4 Answer the following questions. (Any Two) 06**
- a) State the types of differential amplifier.
 - b) With neat diagram explain in brief working of RC coupled amplifier.
 - c) With neat diagram explain in brief voltage divider biasing technique.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain TC coupled Push-pull Class-B power amplifier.
 - b) Explain working of phase shift oscillator. Give formula for frequency of oscillation.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
MICROBIOLOGY - V
Medical Microbiology (G04-DSC1-0411)**

Day & Date: Friday, 17-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat labeled diagram wherever necessary.

Q.1 Choose correct alternative. (MCQ) 06

- 1) The reaction between a soluble antigen and an antibody is known as _____.
 - a) Precipitation
 - b) Agglutination
 - c) Haemagglutination
 - d) Complement fixation

- 2) Incomplete antigen is called as _____.
 - a) Hapten
 - b) Iso-antigen
 - c) Auto-antigen
 - d) Adjuvant

- 3) _____ is the first antibody appearing in primary immune response.
 - a) IgG
 - b) IgD
 - c) IgM
 - d) IgA

- 4) Natural gifted resistance to certain infections shown by all member of species is called as _____.
 - a) Species immunity
 - b) Racial immunity
 - c) Individual immunity
 - d) Passive immunity

- 5) _____ is called the amboceptor in complement fixation test.
 - a) sheep red blood cells coated with rabbit antibody
 - b) Antibody
 - c) Antigen
 - d) Complement

- 6) The second line of defense primarily includes _____.
 - a) skin and mucosa
 - b) Phagocytes and inflammation
 - c) T cells only
 - d) Antibodies

- Q.2 Define the terms. (Any Three) 06**
- a) What is Antigenic determinant?
 - b) Define hapten.
 - c) Define active acquired immunity.
 - d) What is racial immunity?
 - e) Define pathogenicity.
- Q.3 Answer the following. (Any Two) 06**
- a) Write in short on types of Antigens.
 - b) Write in short role of phagocytosis in immunity.
 - c) Describe the complement fixation test.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain factors affecting pathogenicity of pathogen with examples.
 - b) Explain structure and function of IgA.
 - c) Write short note on features of antigen-antibody reactions.
- Q.5 Answer the following question. (Any One) 06**
- a) Describe in detail about the mechanical barriers involved in innate immunity.
 - b) Describe various precipitation techniques in details with example.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
GEOGRAPHY - V
Oceanography (G04-DSC1-0413)**

Day & Date: Friday, 17-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagram wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Choose correct alternative. (MCQ)**06**

- 1) _____ is a sub branch of Oceanography.

a) Physical Oceanography	b) Climatology
c) Population	d) Human

- 2) _____ following is the cold Current.

a) Mozambique	b) S.W. Monsoon
c) North-East Monsoon	d) West Wind Drift

- 3) _____ is deepest trench in Indian Ocean.

a) Sunda	b) Mariyana
c) Makran	d) Ob

- 4) Peru Current known as _____ current.

a) Ritter	b) Humboldt
c) Chili	d) Robert

- 5) _____ is largest trench in world.

a) Sunda	b) Mariana
c) Kalka	d) Badra

- 6) Is _____ third largest ocean in the world.

a) Indian Ocean	b) Atlantic Ocean
c) Artic Ocean	d) Pacific Ocean

Q.2 Answer the following questions. (Any Three)**06**

- a) Define the Oceanography.
- b) Define the term of continental slope.
- c) Define the term of Ocean Currents.
- d) Define the term of El-Nino.
- e) State the any two characteristics of Cold Current.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain the Branches of Oceanography.
 - b) Describe the types of Currents in Indian Ocean.
 - c) Importance of Oceanography.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain the trenches of Pacific Ocean.
 - b) Explain the Scope of Oceanography.
 - c) Explain the Pacific Ocean currents.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain the Nature of Oceanography.
 - b) Explain the factors affecting on currents.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
COMPUTER SCIENCE – V
Foundations of Core Java (G04-DSC1-0415)**

Day & Date: Friday, 17-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative. (MCQ) 06

- 1) Which one of the following is not a Java feature?
 - a) Object-oriented
 - b) Use of pointers
 - c) Portable
 - d) Dynamic and Extensible

- 2) What is the extension of java code files?
 - a) .js
 - b) .txt
 - c) .class
 - d) .java

- 3) Which exception is thrown when java is out of memory?
 - a) MemoryError
 - b) OutOfMemoryError
 - c) MemoryOutOfBoundsException
 - d) MemoryFullException

- 4) Which of these are selection statements in Java?
 - a) break
 - b) continue
 - c) for()
 - d) if()

- 5) Which of these keywords is used to define interfaces in Java?
 - a) intf
 - b) Intf
 - c) interface
 - d) Interface

- 6) Which of these keywords are used for the block to be examined for exceptions?
 - a) check
 - b) throw
 - c) catch
 - d) try

Q.2 Answer the following questions. (Any Three) 06

- a) Define Variable.
- b) What is Collection Framework?
- c) Write syntax of Array.
- d) What is Exception Handling?
- e) What is use of this keyword?

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain Constructor with Example.
 - b) Difference between Abstract class and interface.
 - c) Explain new operator.
- Q.4 Answer the following questions. (Any Two) 06**
- a) What are different types of Inheritance?
 - b) What is thread? Explain thread life cycle.
 - c) Write a program to Demonstrate ArrayList collection class.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain Types of JDBC Drivers in detail.
 - b) Create multithreaded program that demonstrate thread synchronization using synchronize keyword.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Describe Gneissose Structure.
 - b) Distinguish between Slate and Phyllite.
 - c) Explain the Subduction zone.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Distinguish between Prograde and Retrograde Metamorphism.
 - b) Describe hydrothermal metamorphism.
 - c) Describe Polymetamorphism and Anataxis.
- Q.5 Answer the following question. (Any One) 06**
- a) Describe structures of metamorphism.
 - b) Describe the Barrovian series.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
MATHEMATICS - V
Ordinary Differential Equations (G04-DSC1-0419)**

Day & Date: Friday, 17-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Multiple choice questions.

06

- 1) The solution of $p = \tan(px - y)$ is _____.
 - a) $c = \tan(cx - y)$
 - b) $y = \tan(cx)$
 - c) $y = \tan^{-1} c$
 - d) $y = cx - \tan^{-1} c$
- 2) If $P + Qx = 0$, then the solution of equation $\frac{d^2y}{dx^2} + P \frac{dy}{dx} + Qy = 0$ is _____.
 - a) $u = e^x$
 - b) $u = e^{-x}$
 - c) $u = e^{2x}$
 - d) $u = x$
- 3) By using substitution $x = e^z$, the value of $x^2 \frac{d^2y}{dx^2}$ in the homogeneous linear equation is _____.
 - a) D^2y
 - b) $D(D + 1)y$
 - c) $D(D - 1)y$
 - d) $(D - 1)(D - 2)y$
- 4) The value of P, Q, R in the simultaneous equation $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$ represents _____.
 - a) d.r.s. of tangent to curve
 - b) d.r.s. of any line
 - c) d.x.s. of any line
 - d) d.r.s. of normal to the curve
- 5) One of the solutions of the simultaneous equations $\frac{dx}{y-z} = \frac{dy}{z-x} = \frac{dz}{x-y}$ is _____ equation.
 - a) $xyz = c_1$
 - b) $x + y + z = c_1$
 - c) $x^2yz = c_1$
 - d) $x - y - z = c_1$
- 6) General solution of Clairaut's equation represents family of _____.
 - a) circles
 - b) hyperbolas
 - c) parabolas
 - d) straight line

Q.2 Answer the following. (Any Three) 06

- a) Give any two examples of equations of the first order and degree higher than one.
- b) If $a^2 + aP + Q = 0$, then show that $y = e^{ax}$ is solution of $\frac{d^2y}{dx^2} + P\frac{dy}{dx} + Qy = 0$
- c) Solve $x^2 \frac{d^2y}{dx^2} - 4x \frac{dy}{dx} + 6y = x$
- d) Solve $\frac{dx}{x} = \frac{dy}{y} = \frac{dz}{z}$
- e) Solve $\frac{dx}{mz - ny} = \frac{dy}{nx - lz} = \frac{dz}{ly - mx}$

Q.3 Answer the following. (Any Two) 06

- a) Solve $x^3 \frac{d^2y}{dx^2} - 2x^2 \frac{dy}{dx} + 2xy = 1$
- b) Solve $\frac{d^2y}{dx^2} + 2x \frac{dy}{dx} + (x^2 + 1)y = x^3 - 3x$
- c) Solve $xp^2 - 2py + ax = 0$

Q.4 Answer the following. (Any Two) 06

- a) Solve $x^6 \frac{d^2y}{dx^2} + 3x^5 \frac{dy}{dx} + 9y = \frac{1}{x^2}$
- b) Solve $(x + 2)^2 \frac{d^2y}{dx^2} - 4(x + 2) \frac{dy}{dx} + 6y = x$
- c) Solve $2xyz dx - z(x^2 + z)dy - y(x^2 + y)dz = 0$

Q.5 Answer the following. (Any One) 06

- a) Solve $(3 - 2x)^2 \frac{d^2y}{dx^2} - 18(3 - 2x) \frac{dy}{dx} + 20y = 12x$
- b) Explain the method of solving the equation $\frac{d^2y}{dx^2} + P \frac{dy}{dx} + Qy = R$ where P, Q, R are function of x , by removal of the first order derivative by changing the dependent variable.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
STATISTICS - V
Continuous Probability Distributions - II (G04-DSC1-0421)**

Day & Date: Friday, 17-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of Calculator is allowed.

Q.1 Choose the correct alternative.

06

- 1) If X follows uniform distribution over $(0,1)$, then its mean is _____.
 - a) 0
 - b) 1
 - c) $\frac{1}{2}$
 - d) None of these

- 2) Let r. v. $X \sim G(4,2)$, then mode = _____.
 - a) 0.5
 - b) 0.25
 - c) 2
 - d) 0.125

- 3) The range of beta variate of 1st kind is _____.
 - a) $(0, \infty)$
 - b) $(0,1)$
 - c) $(-\infty, \infty)$
 - d) $(-1,1)$

- 4) Let $X \sim N(\mu, \sigma^2)$, then the values of the coefficients of β_1 and β_2 are _____.
 - a) $(0,1)$
 - b) $(0,3)$
 - c) (μ, σ^2)
 - d) None of these

- 5) The mean and variance of chi square distribution with 10 d.f. are _____.
 - a) 10 and 10
 - b) 10 and 20
 - c) 20 and 10
 - d) 20 and 20

- 6) The mean of $F_{(4,10)}$ variate is same as that of _____.
 - a) $F_{(4,10)}$ variate
 - b) $F_{(10,10)}$ variate
 - c) both a and b
 - d) $F_{(10,6)}$ variate

- Q.2 Answer the following. (Any Three) 06**
- a) State c. d. f. of an exponential distribution with parameter θ .
 - b) State mean and variance of gamma distribution with parameter (α, λ) .
 - c) If $X \sim N(2,4)$, then find the 4th central moment.
 - d) If X is a t variate with 5 d. f., then state mean and variance of X .
 - e) If mode of $F_{(10, n_2)} = 0.04$, find the value of n_2 .
- Q.3 Answer the following. (Any Two) 06**
- a) Let a random variable X has $U(0, \theta)$ distribution. Find the c.d.f. of X and hence determine median of X .
 - b) State and prove additive property of gamma distribution.
 - c) Find median of normal distribution.
- Q.4 Answer the following. (Any Two) 06**
- a) Find mean and harmonic mean of beta distribution of second kind.
 - b) Find variance of t distribution.
 - c) Find mean of F distribution.
- Q.5 Answer the following. (Any One) 06**
- a) Find m.g.f. of exponential distribution with parameter θ , hence or otherwise find its mean and variance.
 - b) Derive the p.d.f. of Chi-square distribution with n d. f.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
Environmental Science - V
Environmental Pollution – (G04-DSC1-0423)**

Day & Date: Friday, 17-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.**06**

- 1) The most abundant gas in the atmosphere is _____.
 - a) Oxygen
 - b) Nitrogen
 - c) Carbon dioxide
 - d) Argon
- 2) Which of the following is a primary air pollutant?
 - a) Ozone
 - b) PAN
 - c) Carbon monoxide
 - d) Acid rain
- 3) BOD stands for _____.
 - a) Biological Oxygen Demand
 - b) Biochemical Oxygen Demand
 - c) Both a and b
 - d) None
- 4) Heavy metals in water include _____.
 - a) Lead
 - b) Mercury
 - c) Cadmium
 - d) All of the above
- 5) Topsoil is also called _____.
 - a) A-horizon
 - b) B-horizon
 - c) C-horizon
 - d) Bedrock
- 6) Thermal pollution is mainly caused by _____.
 - a) Power plants
 - b) Agriculture
 - c) Mining
 - d) Transportation

Q.2 Answer the following. (Any Three)**06**

- a) Define air pollution.
- b) What is soil profile?
- c) What is decibel (dB)?
- d) Define water pollution.
- e) What is thermal pollution?

- Q.3 Answer the following. (Any Two) 06**
- a) Describe the formation of photochemical smog.
 - b) Explain pH and its role in water quality.
 - c) Discuss solid waste disposal and its impact on soil.
- Q.4 Answer the following. (Any Two) 06**
- a) Define noise pollution and explain its sources.
 - b) Discuss the effects of thermal pollution on aquatic ecosystems.
 - c) Define space pollution and explain its causes.
- Q.5 Answer the following. (Any One) 06**
- a) Explain sources of water pollution (domestic, industrial, agricultural) in detail.
 - b) Discuss the impact of fertilizers, pesticides, and heavy metals on soil quality.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
PHYSICS – VI
Modern Physics (G04-DSC1-0402)**

Day & Date: Saturday, 18-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams and give equations wherever necessary.

Q.1 Select the correct alternative:

06

- 1) According to Einstein's postulates of special theory of relativity, the velocity of light in free space is _____.
 - a) Increases
 - b) Decreases
 - c) Constant
 - d) Zero

- 2) The theory of matter waves proposed by _____.
 - a) Einstein
 - b) Compton
 - c) De-Broglie
 - d) Newton

- 3) Anamolous Zeeman effect produces when external magnetic field applied to spectral lines is _____.
 - a) weak
 - b) strong
 - c) zero
 - d) infinity

- 4) The inertial frame of reference is _____ frame of reference.
 - a) an accelerated
 - b) un accelerated
 - c) a steady
 - d) variable

- 5) For nuclear fission the best projectile used is _____.
 - a) proton
 - b) electron
 - c) positron
 - d) neutron

- 6) The common material used as a fuel in reactor is _____.
 - a) Cadmium
 - b) Lanthanum
 - c) Lithium
 - d) Uranium

Q.2 Answer the following. (Any Three)

06

- a) Write Lorentz transformation equation.
- b) Define Compton effect.
- c) State Pauli's exclusion principle.
- d) State Hund's rule.
- e) What is nuclear fission.

- Q.3 Answer the following. (Any Two) 06**
- a) Write note on chain reaction.
 - b) Explain Davission and Germer experiment.
 - c) State quantum number associated with vector atom model.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain construction and working of Stern and Gerlach experiment.
 - b) Explain construction and working of nuclear reactor.
 - c) Derive velocity addition theorem.
- Q.5 Answer the following. (Any One) 06**
- a) Derive Einstein's mass-energy relation.
 - b) Obtain Bohr's quantum condition on the basis of matter waves.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026**

CHEMISTRY – VI

Analytical and Industrial Inorganic Chemistry (G04-DSC1-0404)

Day & Date: Saturday, 18-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options. 06

- 1) In Contact process for manufacture of H_2SO_4 _____ used for absorption of Sulphur dioxide.
 - a) Concentrated Ammonia
 - b) HCl
 - c) pyrosulphuric acid
 - d) 98% sulphuric acid

- 2) 12-20% of _____ is present in stainless steel along with nickel.
 - a) chromium
 - b) carbon
 - c) copper
 - d) cobalt

- 3) For the production of good yield of ammonia the proportion of $N_2 : H_2$ is _____.
 - a) 1:1
 - b) 1:3
 - c) 1.11
 - d) 3:2

- 4) The oxine is a _____ chelating agent.
 - a) monodentate
 - b) hexadentate
 - c) bidentate
 - d) tetradentate

- 5) The solution of known strength is known as _____ solution.
 - a) normal
 - b) pure
 - c) molar
 - d) standard

- 6) The color change interval for the methyl red indicator is _____.
 - a) 4.2-6.3
 - b) 10.1-12.1
 - c) 8.3-10.0
 - d) 2.9-4.9

Q.2 Answer the following. (Any Three) 06

- a) What is meant by neutralization titration? Give an example.
- b) Define gravimetric analysis and precipitation.
- c) Write the reactions involved in manufacture of sulphuric acid by contact process.
- d) Draw the diagram of LD process for manufacture of steel.
- e) Define annealing and hardening.

- Q.3 Answer the following. (Any Two) 06**
- a) What are the conditions for good precipitation.
 - b) Draw the labeled diagram of Haber's process for manufacture of ammonia.
 - c) What are the types of EDTA titrations discuss any one.
- Q.4 Write Short Note: (Any Two) 06**
- a) Choice of indicator for strong acid against strong base titration.
 - b) Digestion.
 - c) Contact catalytic convertor.
- Q.5 Answer the following. (Any One) 06**
- a) What is meant by acid-base indicator? Discuss the pH transition or colour change interval of neutralization indicator.
 - b) Discuss the physico-chemical principles used in manufacture of ammonia by Haber's process.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
CHEMISTRY – VI
Basic Paint Manufacturing (G04-DSC1-0428)**

Day & Date: Saturday, 18-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options.

06

- 1) Pigment Volume Concentration (PVC) is defined as: _____.
 - a) Weight of pigment in paint
 - b) Ratio of pigment volume to total non-volatile volume
 - c) Volume of solvent in paint
 - d) Density of pigment

- 2) Critical Pigment Volume Concentration (CPVC) is the point at which _____.
 - a) Paint becomes glossy
 - b) Binder just fills the voids between pigment particles
 - c) Solvent evaporates completely
 - d) Pigment dissolves in binder

- 3) Rheology deals with _____.
 - a) Chemical composition
 - b) Flow behaviour of paint
 - c) Pigment colour
 - d) Drying mechanism

- 4) Which equipment is commonly used for fine grinding of pigments?
 - a) Ball Mill
 - b) Pug Mill
 - c) Triple Roll Mill
 - d) Attritor

- 5) Sand Mill is also known as: _____.
 - a) Bead Mill
 - b) Pug Mill
 - c) Roller Mill
 - d) Attritor

- 6) The spraying method of application provides: _____.
 - a) Thick coating only
 - b) Uniform and smooth finish
 - c) High material wastage only
 - d) Poor levelling

- Q.2 Answer the following. (Any Three) 06**
- a) Give the Advantages and Disadvantages of Paints.
 - b) List any two advantages and two limitations of the brushing method of paint application.
 - c) What is Pug Mills?
 - d) Briefly explain the function of metallic pigments in coating applications. Provide examples.
 - e) What is the tinting strength of a pigment?
- Q.3 Answer the following. (Any Two) 06**
- a) Explain the mechanism of pigment dispersion, including the stages of:
 - Wetting
 - Grinding (Dispersion)
 - Stabilisation
 - b) What are waterproofing chemicals? Where are they applied during the painting process?
 - c) Explain the guidelines for paint formulations.
- Q.4 Answer the following. (Any Two) 06**
- a) What is the difference between area inspection for interior painting and exterior painting?
 - b) Explain the guidelines for applying paint using the Roller Coating method:
 - 1) Selection criteria for rollers
 - 2) Two advantages and two limitations
 - c) Application of Decorative and architectural paints.
- Q.5 Answer the following. (Any One) 06**
- a) List the essential inputs and information required before starting a paint formulation.
 - b) Define Plaster of Paris. What are the advantages of using Plaster of Paris in interior decoration?

Seat
No.Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
CHEMISTRY – VI
Pharmaceutical and Fine Chemicals - II (G04-DSC1-0426)**

Day & Date: Saturday, 18-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options. 06

- 1) Zeta potential is measured by using _____ in suspension.
 - a) Zeta meter
 - b) Viscometer
 - c) pH meter
 - d) Thermometer
- 2) _____ is a type of trituration method in emulsion.
 - a) Dry gum method
 - b) Wet gum method
 - c) Both a & b
 - d) Bottle method
- 3) The prefix Oxa is used for the heteroatom _____.
 - a) S
 - b) O
 - c) N
 - d) P
- 4) _____ is an example of six membered heterocyclic compound.
 - a) Furan
 - b) Pyridine
 - c) Triazole
 - d) Imidazole
- 5) _____ is called as a breast bone.
 - a) Skull
 - b) Vertebral column
 - c) Capel
 - d) Sternum
- 6) WBSs are also known as _____.
 - a) Leucocytes
 - b) Erythrocytes
 - c) Thrombocytes
 - d) None

Q.2 Answer the following. (Any Three) 06

- a) Define:
 - i) Creams
 - ii) Gels
- b) Explain different types of capsules.
- c) Give two examples of six membered heterocyclic compounds.
- d) Draw the structure of heart and give names to its parts.
- e) Give functions of skeleton system.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain different evaluation tests for ointment.
 - b) Explain steps involved in manufacturing of hard gelatine capsules.
 - c) Define:
 - i) Health
 - ii) Disease
 - iii) Genotoxicity
- Q.4 Answer the following. (Any Two) 06**
- a) Explain stability problems in emulsions.
 - b) Give synthesis of caffeine.
 - c) Explain in brief different parts of the brain.
- Q.5 Answer the following. (Any One) 06**
- a) Explain in detail wet granulation method in tablet manufacturing.
 - b) Explain in detail about cranial nerves.

- Q.3 Answer the following. (Any Two) 06**
- a) Describe orthotropous ovule.
 - b) Write a note on nuclear endosperm.
 - c) Define seed dispersal. Describe animal dispersal of fruit with example.
- Q.4 Answer the following. (Any Two) 06**
- a) Describe flower as a modified shoot with example.
 - b) Describe development of monocot embryo.
 - c) Give significance of double fertilization.
- Q.5 Answer the following. (Any One) 06**
- a) Describe the monosporic (*Polygonum*) embryo sac with diagram.
 - b) Define pollination. Describe pollination mechanism in *Zea mays*.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
ZOOLOGY - VI
Animal Physiology (G04-DSC1-0408)**

Day & Date: Saturday, 18-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.

Q.1 Choose correct alternatives.**06**

- 1) The cells are produced in bone marrow are _____.
 - a) Erythrocytes
 - b) Leucocytes
 - c) Thrombocyte
 - d) Megakaryocytes
- 2) In _____ part of digestive system absorption of food takes place.
 - a) Small Intestine
 - b) Large Intestine
 - c) Pancreas
 - d) Liver
- 3) The points of contact between neurons where information is passed from one neuron to next is called _____.
 - a) Synapse
 - b) Junction
 - c) Nerve ending
 - d) Connective tissue
- 4) In IVF technique zygote or early embryo is transferred into _____.
 - a) Cervical canal
 - b) Fimbria
 - c) Fallopian tube
 - d) Vagina
- 5) The Oestrous cycle is the main reproductive cycle of _____.
 - a) Vertebrate
 - b) Primate vertebrate
 - c) Non-Primate vertebrate
 - d) Invertebrate
- 6) _____ of these has the highest permeability in a resting nerve cell.
 - a) Cl⁻
 - b) Na⁺
 - c) K⁺
 - d) I⁻

Q.2 Answer the following. (Any Three)**06**

- a) Sketch and label T.S. of Pancreas.
- b) Write functions of blood.
- c) Oral Contraceptive Pills.
- d) Functions of Nephron.
- e) Enlist types of excretory wastes.

- Q.3 Answer the following. (Any Two) 06**
- a) With suitable diagram explain the structure of kidney.
 - b) Describe Technique of IVF and its applications.
 - c) Explain Resting membrane potential.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain the Structure of Synapse and Synaptic transmission.
 - b) Describe in detail structure, location, classification and functions of epithelial tissues.
 - c) Explain mechanical and chemical digestion of food.
- Q.5 Answer the following. (Any One) 06**
- a) With suitable diagram explain Menstrual cycle.
 - b) Explain in detail the mechanism of urine formation.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
ELECTRONICS - VI
Pulse and Switching Circuits (G04-DSC1-0410)**

Day & Date: Saturday, 18-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.**06**

- 1) A clamping circuit is used to _____.
 - a) Limit amplitude
 - b) Shift DC level
 - c) Amplify signal
 - d) Generate pulses
- 2) In RC time base circuit, output is taken across _____.
 - a) Resistor
 - b) Capacitor
 - c) Inductor
 - d) Transformer
- 3) UJT relaxation oscillator produces _____.
 - a) Square wave
 - b) Triangular wave
 - c) Sawtooth wave
 - d) Sine wave
- 4) _____ multivibrator has two stable states.
 - a) Astable
 - b) Monostable
 - c) Bistable
 - d) None
- 5) In Schmitt trigger, difference between UTP and LTP is called _____.
 - a) Gain
 - b) Bandwidth
 - c) Hysteresis
 - d) Noise margin
- 6) Pin number 3 of IC 555 is called _____ pin.
 - a) Trigger
 - b) Output
 - c) Reset
 - d) Control voltage

Q.2 Answer the following. (Any Three)**06**

- a) What is an integrator circuit?
- b) State two features of time base circuits.
- c) What is hysteresis in Schmitt trigger?
- d) Define duty cycle.
- e) Mention any two applications of UJT.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain diode clamping circuit with neat diagram.
 - b) Explain triggering methods of monostable multivibrator.
 - c) Explain functional block diagram of IC 555.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain collector-coupled astable multivibrator operation.
 - b) Explain astable multivibrator using logic gates.
 - c) Explain linearity considerations using constant current source.
- Q.5 Answer the following. (Any One) 06**
- a) Describe Astable multivibrator using IC 555 with Operation, Waveforms, Derivation of frequency and duty cycle.
 - b) Describe collector-coupled Monostable multivibrator with Operation, Waveforms, Derivation of gate width.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
MICROBIOLOGY - VI
Industrial Microbiology (G04-DSC1-0412)**

Day & Date: Saturday, 18-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagram whenever necessary.
3) Figures to right indicate full marks.

Q.1 Choose correct alternatives.

06

- 1) The main function of an impeller in a fermenter is _____.
 - a) Sterilization
 - b) Mixing and oxygen transfer
 - c) Temperature control
 - d) pH regulation
- 2) Lyophilization is a method of _____.
 - a) Scale-up
 - b) Fermentation
 - c) Preservation
 - d) Inoculum development
- 3) Penicillin inhibits bacterial growth by interfering with _____.
 - a) Protein synthesis
 - b) DNA replication
 - c) Cell wall synthesis
 - d) RNA transcription
- 4) Single Cell Protein (SCP) is mainly used as _____.
 - a) Antibiotic
 - b) Biofuel
 - c) Nutritional supplement
 - d) Enzyme
- 5) If foaming increases during submerged fermentation, the immediate corrective measure is to _____.
 - a) Reduce temperature
 - b) Increase agitation speed
 - c) Add antifoaming agent
 - d) Increase aeration rate
- 6) The primary advantage of continuous fermentation is _____.
 - a) Easier sterilization
 - b) Higher productivity per unit time
 - c) Lower contamination risk
 - d) Simple operation

Q.2 Answer the following. (Any Three)

06

- a) Define Inoculum.
- b) Distinguish between Dual and Multiple Fermentation.
- c) Define media optimization.
- d) Enlist the advantages and disadvantages of SPC.
- e) What are antifoam agents? Give any two examples.

- Q.3 Answer the following. (Any Two) 06**
- a) Write in short Waste materials used for fermentation media with their examples.
 - b) Describe secondary screening.
 - c) Write in short methods used for preservation of industrially important microorganisms.
- Q.4 Answer the following. (Any Two) 06**
- a) Write a note on scale up of fermentation.
 - b) Draw neat labelled diagram of typical fermenter.
 - c) Differentiate between Batch and continuous fermentation.
- Q.5 Answer the following. (Any One) 06**
- a) Explain in detail the fermentative production of Penicillin.
 - b) Write in short the methods used for strain improvement.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
GEOGRAPHY - VI
Settlement Geography (G04-DSC1-0414)**

Day & Date: Saturday, 18-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Choose correct alternatives.**06**

- 1) _____ Geography is a branch of Human Geography.
 - a) Physical
 - b) Climatology
 - c) Metrology
 - d) Settlement
- 2) A place of dwelling or a place of permanent residence is known as _____.
 - a) Settlement
 - b) Slum
 - c) Urbanization
 - d) Urban Planning
- 3) _____ is a father of Settlement Geography.
 - a) Carl Ritter
 - b) Humboldt
 - c) Mackinder
 - d) Otto Schluter
- 4) _____ is the largest slum in Asia.
 - a) Cite Soleil
 - b) Dharavi
 - c) Kibera
 - d) Orangi Town
- 5) Dry point settlements are common in _____.
 - a) Delta
 - b) Mountain
 - c) Desert
 - d) Plain
- 6) _____ problem is known as cancer in urban area.
 - a) Slum
 - b) Rural Settlements
 - c) Rich Settlements
 - d) Middle class settlement

Q.2 Answer the following. (Any Three)**06**

- a) Define the concept of Settlement Geography.
- b) Define the concept of urban settlement.
- c) Define the term of urbanization.
- d) Define the term of urban pollution.
- e) Define the term of rural urban fringe.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the scope of Settlement Geography.
 - b) Describe the classification of Towns.
 - c) Describe urbanization processes.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain the types of rural settlement.
 - b) Explain the problems of urbanization.
 - c) Explain the pattern of urban settlement.
- Q.5 Answer the following. (Any One) 06**
- a) Explain the problems of urban settlement.
 - b) Explain the trends of urbanization in India.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
COMPUTER SCIENCE - VI
Python Programming (G04-DSC1-0416)**

Day & Date: Saturday, 18-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to right indicate full marks.
3) Draw neat labelled diagrams wherever necessary.

Q.1 Multiple choice questions.**06**

- 1) _____ command is used to execute a Python program.
 - a) run file.py
 - b) python file.py
 - c) execute file.py
 - d) all of these
- 2) Which function is used for user input in Python?
 - a) scan()
 - b) input()
 - c) read()
 - d) get()
- 3) _____ statement is used to exit a loop immediately.
 - a) break
 - b) pass
 - c) continue
 - d) return
- 4) _____ does not allow duplicate values.
 - a) List
 - b) Tuple
 - c) Set
 - d) Dictionary
- 5) _____ keyword is used to define a function.
 - a) function
 - b) define
 - c) def
 - d) fun
- 6) _____ block always executes whether exception occurs or not.
 - a) try
 - b) except
 - c) else
 - d) finally

Q.2 Attempt the following. (Any Three)**06**

- a) What is PVM?
- b) Write use of finally block.
- c) What are identifiers? State rules for naming identifiers.
- d) What is lambda function?
- e) List out file opening mode in python.

- Q.3 Attempt the following. (Any Two) 06**
- a) Explain map(), filter(), and reduce() functions.
 - b) What is file handling? Explain opening file and writing file operation.
 - c) Explain features of python.
- Q.4 Attempt the following. (Any Two) 06**
- a) Write a program to demonstrate creating and using modules.
 - b) Define function. Explain types of function in python.
 - c) Write a Python program to demonstrate use of try-except-finally.
- Q.5 Attempt the following. (Any One) 06**
- a) Explain if-elif-else statements with example.
 - b) Explain break, continue, and pass statements.

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Set P

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
GEOLOGY - VI
Paleontology (G04-DSC1-0418)**

Day & Date: Saturday, 18-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to right indicate full marks.
3) Draw diagram wherever necessary.

Q.1 Fill in the blank with appropriate options given below. 06

- 1) Curved base below mamelon of Granule's is called _____.
a) Boss b) Spine
c) Muscles d) Secondary
- 2) A depression running from umbo to margin of spirifer is called as _____.
a) Sulcus b) Ridge
c) Suture d) Pallial Line
- 3) Small spherical ornamentation of Echinus called as _____.
a) Spine b) Knobs
c) Granules d) Ribs
- 4) Elevated circular part where spine fits in Echinus is _____.
a) Mamelon b) Boss
c) Muscles d) Suture
- 5) Lamellibranch shell shows more growth towards _____.
a) Anterior b) Posterior
c) Dorsal d) Ventral
- 6) Beak like projection of Prachiopod shell is called _____.
a) Margin b) Siphuncle
c) Umbo d) Pygidium

Q.2 Attempt any three of the following. 06

- a) Define ridge in Spirifer.
- b) Define peristome of Echinoids.
- c) Define sinistral Gastropods shell.
- d) Define lips of Gastropods.
- e) Define Index Fossil.
- f) Define Apex angle of Gastropods shell.

- Q.3 Attempt any two of the following. 06**
- a) Describe Conus shell in detail.
 - b) Describe aperture types of Gastropods based on if shape. Give examples.
 - c) Describe ornamentation of Echinus.

- Q.4 Attempt any two of the following. 06**
- a) Describe the process and two examples of 'Entire Organism Preserved' type mode.
 - b) Describe the changes in legs of horse during its evolution.
 - c) Describe environments of coelenterate and their importance in ocean water.

- Q.5 Attempt any one of the following. 06**
- a) Describe the morphological characteristics of Brachiopoda shell.
 - b) Describe the corona and peristome of Echinoid.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
MATHEMATICS - VI
Abstract Algebra - I (G04-DSC1-0420)**

Day & Date: Saturday, 18-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative of the following. **06**

- 1) If H and K are subgroups of group G then HK is subgroup of G iff _____.

a) $HK = KH$	b) $HK = G$
c) $HK = H$	d) $KH = H$
- 2) Every group of order 13 is _____.

a) Cyclic and Abelian	b) Cyclic but non-Abelian
c) Abelian but not cyclic	d) neither abelian nor cyclic
- 3) The number of generator for Z_9 is _____.

a) 2	b) 4
c) 6	d) 8
- 4) For Euler ϕ function, $\phi(12) =$ _____.

a) 1	b) 3
c) 4	d) 5
- 5) If p/q and q/r then _____.

a) r/p	b) p/r
c) r/q	d) $n!$
- 6) The number of element in D_n are _____.

a) n	b) n^2
c) $2n$	d) $n!$

Q.2 Answer the following. (Any Three) **06**

- a) Define group and subgroup.
- b) Construct Cayley table for (Z_4, \oplus)
- c) Compute gcd (6,14) by using Euclidean Algorithm.
- d) In (Z_6, \oplus) find order of [5]
- e) Find all eight cosets in quotient group $\frac{Z}{5Z}$

- Q.3 Answer the following. (Any Two) 06**
- If $f: G \rightarrow G'$ be a homeomorphism and H' is subgroup of G' then prove that $f^{-1}(H')$ is subgroup of G .
 - Find all subgroups of (Z_6, \oplus) also construct the subgroup lattice.
 - If $\alpha = (1\ 2\ 3\ 4\ 5)$ $\beta = (1\ 3\ 5\ 6\ 7)$, $\alpha, \beta \in S_7$ then find $\alpha^2 \circ \beta^{-1}$
- Q.4 Answer the following. (Any Two) 06**
- Prove that the set of all even permutations in S_n forms a subgroup of $S_n \forall n \geq 2$
 - Prove that $(M_{n \times n}(\mathbb{R}), +)$ under usual matrix addition is group.
 - Prove that every cyclic group is Abelian.
- Q.5 Answer the following. (Any One) 06**
- Find gcd of 143 and 287 and express it as
g.c.d $(287, 143) = 287x + 143y$
 - State and prove Lagrange's Theorem.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
STATISTICS - VI
Statistical Methods (G04-DSC1-0422)**

Day & Date: Saturday, 18-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.

Q.1 Choose the correct alternatives from the options.**06**

- 1) A sample consists of _____.
 - a) all units of the population
 - b) 50 % units of the population
 - c) 5 % units of the population
 - d) any fraction of the population
- 2) Which of the following is not a small sample test?
 - a) t-test
 - b) X^2 – test
 - c) F-test
 - d) Z-test
- 3) In India, the child bearing age is _____.
 - a) 20-24 years
 - b) 15-49 years
 - c) 13-48 years
 - d) 20-29 years
- 4) The number of possible samples of size n from a population of N units by using SRSWR is _____.
 - a) N^n
 - b) N^2
 - c) $n!$
 - d) None of These
- 5) Which one of the following rate is obtained for a segment of a population?
 - a) crude death rate
 - b) standardized death rate
 - c) vital index
 - d) specific death rate
- 6) Rejecting H_0 when H_0 is false leads to _____.
 - a) type-I error
 - b) type-II error
 - c) Power
 - d) none of the type of error.

Q.2 Answer the following. (Any Three)**06**

- a) Define Census and sample.
- b) Explain how S.D.R. is superior to C.D.R.
- c) Define simple and composite hypotheses.
- d) State variance of sample mean in case of SRSWOR.
- e) Define C.B.R.

Q.3 Answer the following. (Any Two) 06

- a) Explain SRSWR and SRSWOR.
- b) Write the procedure to test the hypothesis $H_0: \mu = \mu_0$ v/s $H_1: \mu \neq \mu_0$ when population variance (σ^2) is known.
- c) Define G.F.R. and T.F.R.

Q.4 Answer the following. (Any Two) 06

- a) Describe the procedure of testing specified value of population correlation coefficient.
- b) Define G.R.R. and also state the limitations of G.R.R.
- c) Show that probability of selecting a specified unit at any draw is same as it is being selected at first draw.

Q.5 Answer the following. (Any One) 06

- a) With usual notations, prove that $var(\bar{y}_n)_{wor} = \frac{N-n}{Nn} S^2$
- b) Write the procedure to test the hypothesis $H_0: P_1 = P_2$ v/s $H_1: P_1 \neq P_2$.

- Q.2 Answer the following. (Any Three) 06**
- a) Two thin lenses of focal lengths $f_1 = 10$ cm and $f_2 = 10$ cm are co-axially placed at a distance of 10 cm from each other. Calculate equivalent focal length (F) of this lens system.
 - b) State conditions for constructive and destructive interference of light waves.
 - c) Explain wave theory of light.
 - d) What is a zone plate?
 - e) Mention the three quantum processes in the formation of LASER.
- Q.3 Answer the following. (Any Two) 06**
- a) Discuss any two methods to minimize spherical aberration.
 - b) Explain division of wavefront.
 - c) What is population inversion in case of laser?
- Q.4 Answer the following. (Any Two) 06**
- a) Write a note on Interference by wedge shaped thin film.
 - b) Distinguish between geometrical and spectral resolution.
 - c) Discuss Helium-Neon (He-Ne) LASER.
- Q.5 Answer the following. (Any One) 06**
- a) With a neat ray diagram discuss chromatic aberration.
 - b) Discuss Rayleigh's criterion for the limit of resolution.

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No.Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
CHEMISTRY - V
General Chemistry - III (General Organic Chemistry)
(G04-DSC2-0403) / (G04-DSC2-0433) / (G04-DSC2-0435)**

Day & Date: Monday, 20-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options. 06

- 1) Saturated hydrocarbons mainly undergoes _____ reactions.

a) Addition	b) Substitution
c) Elimination	d) Polymerization

- 2) Anti-Markownikoff's addition of HBr is not observed in _____.

a) Propene	b) But-1-ene
c) But-2-ene	d) Pent-2-ene

- 3) C_nH_{2n} is the general formula of _____.

a) Alkanes	b) Alkenes
c) Alkynes	d) Dienes

- 4) In benzene the carbon- carbon bond distance is _____.

a) 1.39 \AA	b) 1.54 \AA
c) 1.34 \AA	d) 1.20 \AA

- 5) Which of the following is an explosive?

a) Urea	b) Oxalic acid
c) Methanol	d) Glyceryl trinitrate

- 6) Ethylene glycol is used in the manufacture of _____.

a) Artificial silk	b) Terylene
c) Nylon	d) Rubber

Q.2 Answer the following. (Any Three) 06

- a) Write Corey-House reaction.
- b) Explain Huckel's rule with example.
- c) What is meant by internal Wurtz reaction?
- d) Explain acidic nature of alkynes.
- e) Write reactions involved in oxidation of glycerol.

- Q.3 Answer the following. (Any Two) 06**
- a) Write mechanism involved in free radical chlorination of methane.
 - b) Write reactions involved in epoxidation and ozonolysis of ethene.
 - c) Explain Reimer-Tiernan reaction with mechanism
- Q.4 Answer the following. (Any Two) 06**
- a) Describe molecular orbital picture of benzene.
 - b) What is the action of following on cyclopropane?
 - i) Cl_2/Light
 - ii) HBr
 - iii) H_2/Ni
 - c) Write Pinacol- Pinacolone reaction with mechanism.
- Q.5 Answer the following. (Any One) 06**
- a) What are dienes? Write classification of dienes with example. Write two methods of preparation of 1, 3- butadiene.
 - b) What is mean by aromatic electrophilic substitution reaction? Write mechanism involved in nitration of benzene.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
BOTANY - V
Basic Genetics (G04-DSC2-0405)**

Day & Date: Monday, 20-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options. 06

- 1) Hypertrichosis of ear is an example of _____.
 - a) Dominant gene
 - b) Epistatic gene
 - c) Holandric gene
 - d) Supplementary gene
- 2) Different forms of a gene are called _____.
 - a) Genotype
 - b) linked gene
 - c) Gamete
 - d) Allele
- 3) In supplementary interaction ratio obtained is _____.
 - a) 9:3:4
 - b) 9:7
 - c) 9:3:3:1
 - d) 13:3
- 4) The exception to Mendel's law is _____.
 - a) Purity of gametes
 - b) independent assortment
 - c) Linkage
 - d) Crossing over
- 5) ABO blood group inheritance is an example of _____.

<ol style="list-style-type: none"> a) Complementary gene c) Epistasis 	<ol style="list-style-type: none"> b) Incomplete dominance d) Multiple allele
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- 6) Haemophilia disease shows _____ inheritance pattern.
 - a) Autosomal dominant
 - b) Autosomal recessive
 - c) X - linked dominant
 - d) X - linked recessive

Q.2 Answer the following. (Any Three) 06

- a) What is incomplete dominance?
- b) What are multiple allele?
- c) What are pure lines?
- d) What is linkage?
- e) What is non disjunction?

- Q.3 Answer the following. (Any Two) 06**
- a) Describe ZZ-ZW method of sex determination.
 - b) Describe the mechanism of inheritance in disease Haemophilia.
 - c) Explain the concept of co dominance with suitable example.
- Q.4 Answer the following. (Any Two) 06**
- a) Describe the sex linked inheritance in Colorblindness.
 - b) Explain concept of linkage with suitable example.
 - c) Describe Mendel's law of independent assortment with suitable example.
- Q.5 Answer the following. (Any One) 06**
- a) Describe the genic balance theory of sex determination.
 - b) Explain supplementary gene interaction with suitable example.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
ZOOLOGY - V
Biological Pest Management (G04-DSC2-0407)**

Day & Date: Monday, 20-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Sketch and label the diagram whenever necessary.

Q.1 Choose the correct alternatives.**06**

- 1) Study of insect is known as _____.

a) Biology	b) Botany
c) Ethology	d) Entomology
- 2) First organic insecticides was prepared from which group _____.

a) Carbamet	b) Arsenical
c) Organochlorine	d) Organophosphate
- 3) Malaria is transmitted through _____.

a) Male Culex	b) Female Culex
c) Male Anopheles	d) Female Anopheles
- 4) Caterpillar is the _____ stage of Lepidoptera.

a) Egg	b) Larval
c) Pupal	d) Adult
- 5) Mouth parts of cockroach is of _____ type.

a) Biting and chewing	b) Siphoning
c) Sponging	d) Piercing and Sucking
- 6) What is the full form of IPM?

a) Indian Pest Management	b) Integrated Pest Management
c) Integrated Plant Management	d) Indian Plant Management

Q.2 Answer the following. (Any Three)**06**

- a) Toxicology
- b) Aphids
- c) Lady bird beetle
- d) *Bacillus thurengensis*
- e) Cultural control

- Q.3 Answer the following. (Any Two) 06**
- a) Dengue
 - b) Grasshopper
 - c) Trichoderma as a biological control
- Q.4 Answer the following. (Any Two) 06**
- a) Stem borer of fruit plant
 - b) Insecticides
 - c) Parasitoid- wasp
- Q.5 Answer the following. (Any One) 06**
- a) Explain mouth parts of Housefly.
 - b) Describe IPM with the help of Biological control.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
ELECTRONICS - V
Basic Diode and Transistor Circuits (G04-DSC2-0409)**

Day & Date: Monday, 20-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative.**06**

- 1) For a transistor to work in active region _____.
 - a) Both junctions forward biased
 - b) Both junctions reverse biased
 - c) Emitter-base junction forward biased and collector-base junction reverse biased
 - d) Emitter-base junction reverse biased and collector-base junction forward biased

- 2) The current gain (β) of a BJT is defined as _____.
 - a) I_c / I_e
 - b) I_b / I_c
 - c) I_c / I_b
 - d) I_e / I_b

- 3) The basic requirement for oscillation is _____.
 - a) Negative feedback
 - b) Positive feedback
 - c) Zero feedback
 - d) High gain only

- 4) The efficiency of a half-wave rectifier is approximately _____.
 - a) 40.6%
 - b) 60%
 - c) 81.2%
 - d) 100%

- 5) Ripple factor of an ideal full-wave rectifier is _____.
 - a) 0.48
 - b) 1.21
 - c) 0.812
 - d) 0

- 6) A capacitor filter is used in rectifier circuits to _____.
 - a) Increase voltage
 - b) Reduce ripple
 - c) Increase frequency
 - d) Convert AC to DC

Q.2 Answer the following. (Any Three)**06**

- a) What is Barkhausen criterion for sustained oscillations?
- b) Define Q point.
- c) Define ripple factor and PIV.
- d) List advantages of negative feedback.
- e) What is an inductor filter in a power supply?

- Q.3 Answer the following. (Any Two) 06**
- a) Explain half-wave rectifier with diagram.
 - b) Describe DC load-line and its significance.
 - c) Explain transistor as a switch.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain positive clipper circuit.
 - b) State regions of operation of BJT.
 - c) Explain the basic action of transistor as an amplifier.
- Q.5 Answer the following. (Any One) 06**
- a) Explain bridge rectifier with efficiency and ripple factor.
 - b) Explain voltage divider bias circuit with neat and labeled diagram.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
MICROBIOLOGY - V
Medical Microbiology (G04-DSC2-0411)**

Day & Date: Monday, 20-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Rewrite the sentence by using correct alternative given below. 06

- 1) Innate immunity is also called as _____.
a) Specific immunity b) Inborn immunity
c) Acquired immunity d) Adapted immunity
- 2) _____ is temperature rising chemicals of the body.
a) Thermogenics b) Thermophiles
c) Mesogens d) Pyrogens
- 3) Antigen binding site on an antibody is called as _____.
a) Paratope b) Epitope
c) Allotype d) Ideotype
- 4) _____ immunoglobulin is abundant in the serum.
a) IgE b) IgG
c) IgA d) IgM
- 5) Passive immunization is done by using _____.
a) Toxins b) Vaccines
c) Immune sera d) Toxoids
- 6) VDRL test is example of _____.
a) Precipitation test b) Agglutination test
c) Flocculation test d) Complement fixation

Q.2 Answer the following. (Any Three) 06

- a) Define the term Hapten.
- b) Write about Active immunity.
- c) Enlist normal flora of human body.
- d) Define the term pathogenicity.
- e) Define the term Epitope.

- Q.3 Answer the following. (Any Two) 06**
- a) Factors affecting on antigenicity
 - b) Write about first line defense mechanism.
 - c) Passive immunity
- Q.4 Answer the following. (Any Two) 06**
- a) Structure of antibody
 - b) Features of antigen-antibody reaction
 - c) Types of antigen
- Q.5 Answer the following. (Any One) 06**
- a) Write in detail about second line defense mechanism.
 - b) Explain in detail types of immunoglobulins.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
GEOGRAPHY - V
Economic Geography (G04-DSC2-0413)**

Day & Date: Monday, 20-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Choose the correct alternative.**06**

- 1) _____ Geography is a branch of Human Geography.

a) Economic	b) Geomorphology
c) Geology	d) Oceanography

- 2) _____ is father of Economic Geography.

a) Chisholm	b) Weber
c) Trewartha	d) Greek

- 3) Industrial Geography is a sub branch of _____ Geography.

a) Oceanography	b) Agriculture
c) Population	d) Economic

- 4) Coal is a _____ types of resources.

a) Natural	b) Inexhaustible
c) Exhaustible	d) Artificial

- 5) _____ is found under the sedimentary rock.

a) Petroleum	b) Coal
c) Sand	d) Bauxite

- 6) _____ is a father of concept of conservation of resources.

a) D.S. Lal	b) A. Wegener's
c) Thornberry	d) Theodore Roosevelt

Q.2 Answer the following. (Any Three)**06**

- a) Define the term of Economic Geography.
- b) Define the concept non-renewable resources.
- c) Define the term of resource.
- d) Define the term of Agriculture Geography.
- e) State the any two characteristics of bituminous coal.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the nature of Economic Geography.
 - b) Describe the types of Iron ore.
 - c) Importance of Coal
- Q.4 Answer the following. (Any Two) 06**
- a) Explain the resource conservation.
 - b) Explain the scope of Economic Geography.
 - c) Explain the classification of Resources.
- Q.5 Answer the following. (Any One) 06**
- a) Explain the branches of Economic Geography.
 - b) Explain the importance of Power resources.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
COMPUTER SCIENCE - V
Linux Essentials and Shell Programming (G04-DSC2-0415)**

Day & Date: Monday, 20-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat labelled diagrams wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Multiple choice questions.**06**

- 1) Which component of Linux architecture interacts directly with the hardware?

a) Shell	b) Kernel
c) Compiler	d) User
- 2) The command used to change the ownership of a file is _____.

a) chmod	b) own
c) chgrp	d) chown
- 3) In Linux, which process is considered the parent of all processes?

a) init/systemd	b) bash
c) kernel	d) root
- 4) Which filter command is used to display only the first 10 lines of a file?

a) tail	b) grep
c) sed	d) head
- 5) What is the default boot loader for most modern Linux distributions?

a) LILO	b) GRUB
c) BIOS	d) MBR
- 6) Which symbol is used in shell scripting to redirect the output and append it to a file?

a) >	b) <
c) >>	d)

Q.2 Answer the following. (Any Three)**06**

- a) List out the features of the Linux Operating System.
- b) Differentiate between Hard links and Soft links (In command).
- c) Define the role of the System Administrator.
- d) Define mv command.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the Linux File System hierarchy with a neat diagram.
 - b) Describe the chmod command with an example.
 - c) Explain the use of the grep command with options.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain the Architecture of Linux in detail with a diagram.
 - b) What is a Process? Explain ps and kill commands.
 - c) Write a shell script to find entered number is prime or not.
- Q.5 Answer the following. (Any One) 06**
- a) Explain vi editor and its modes in detail.
 - b) Explain following servers:
 - i) DHCP
 - ii) DNS
 - iii) Samba

- Q.3 Answer the following. (Any Two) 06**
- a) What are agents of metamorphic rock?
 - b) Describe thermal metamorphism.
 - c) Describe the depth zones of metamorphism.
- Q.4 Answer the following. (Any Two) 06**
- a) Describe the grades of metamorphism.
 - b) Describe the petrographic details of mica-garnet schist.
 - c) Describe the schistose structure.
- Q.5 Answer the following. (Any One) 06**
- a) Describe augen and gneissose structure.
 - b) Describe the regional and cataclastic metamorphism with examples.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
MATHEMATICS - V**

Principles of Ordinary Differential Equations (G04-DSC2-0419)

Day & Date: Monday, 20-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:**
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Draw neat-labeled diagrams wherever necessary.
 - 4) Use of Log table and Calculator is allowed.

Q.1 Multiple choice questions.**06**

- 1) The solution of $(p + 4)(p - 3) = 0$ is _____.
 - a) $(y + 4x - c)(y - 3x - c) = 0$
 - b) $(y - 4x - c)(y + 3x - c) = 0$
 - c) $(4x + x - c)(3y - x - c) = 0$
 - d) $(4y - x - c)(3y + x - c) = 0$

- 2) The equation $y = px + f(p)$ is called _____ equation.
 - a) Linear
 - b) Bernoulli's
 - c) Clairaut's
 - d) De-Moiver

- 3) If $1 - P + Q = 0$ then the solution of the equation.

$$\frac{d^2y}{dx^2} + P \frac{dy}{dx} + Qy = 0$$
 is _____.
 - a) $y = e^{-x}$
 - b) $y = e^x$
 - c) $y = x$
 - d) $y = \sin x$

- 4) By using substitution $x = e^z$, the value of $x^2 \frac{d^2y}{dx^2}$ in the homogeneous linear equation is _____.
 - a) D^2
 - b) $D(D + 1)$
 - c) $D(D - 1)$
 - d) $(D - 1)(D - 2)$

- 5) The differential equation of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$ where P, Q, R are function of x, y, z are called _____ equation.
 - a) total differential
 - b) linear differential
 - c) Homogeneous linear differential
 - d) Simultaneous differential

Q.2 Answer the following. (Any Three) 06

- State second and fourth central moment of normal distribution with mean μ and variance σ^2 .
- Let the random variable X follow chi-square distribution with parameter 8. Then state the value of variance and mode.
- Explain one tailed test.
- Define simple hypothesis and composite hypothesis.
- If $F \sim F_{(10,5)}$ d.f., then state the variance of F .

Q.3 Answer the following. (Any Two) 06

- Find mean of normal distribution.
- Find variance of t distribution.
- Describe the procedure to test for testing population mean $\mu = \mu_0$ based on t - distribution.

Q.4 Answer the following. (Any Two) 06

- Find mode of chi-square distribution.
- Explain the test procedure for testing the independence of attributes in case of $m \times n$ contingency table.
- How can one test the hypothesis of equality of two population correlation coefficients by using Fisher Z- transformation.

Q.5 Answer the following. (Any One) 06

- For the 2×2 contingency table, prove that the chi-square test for independence given

$$x^2 = \frac{N(ad - bc)^2}{(a + c)(b + d)(a + b)(c + d)}$$

- Derive the p.d.f. of F distribution with n d. f.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
ENVIRONMENTAL SCIENCE - V
Solid Waste Management (G04-DSC2-0423)**

Day & Date: Monday, 20-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative.

06

- 1) Which option best describes municipal solid waste (MSW)?
 - a) Waste generated mainly from factories and mines
 - b) Everyday solid waste from homes, shops, offices, streets, and small institutions
 - c) Every kind of hazardous chemical waste in a city
 - d) Only food waste generated in households and restaurants

- 2) Which of the following is the best example of e-waste?
 - a) Broken bricks from a construction site
 - b) An old, discarded mobile phone
 - c) Leftover vegetable peels from a kitchen
 - d) Garden leaves collected after pruning

- 3) Why is segregation of waste at source in the home or shop so important?
 - a) It mainly helps to hide waste from public view
 - b) It only reduces the weight of the waste
 - c) It makes mixed waste easier to burn in open dumps
 - d) It improves recycling, composting, and safe disposal by keeping different waste streams separate from the beginning

- 4) Which of the following best describes composting?
 - a) Burying all types of waste together in a low-lying area
 - b) Biological decomposition of organic waste into a nutrient-rich soil like material
 - c) Melting plastic waste to make new plastic products
 - d) Burning waste at very high temperatures

- 5) What is the main purpose of a sanitary landfill in solid waste management?
 - a) To mix hazardous and non-hazardous waste together
 - b) To dump waste openly without any covering
 - c) To store and manage waste in a controlled manner with layers, compaction, and daily cover
 - d) To burn all waste to remove volume quickly

- 6) Which type of waste is most suitable for producing biogas in a small household or community biogas plant?
- a) Construction debris like sand and bricks
 - b) Broken glass and ceramics
 - c) Plastic bottles and metal cans
 - d) Food scraps, vegetable peels, and animal dung

Q.2 Answer the following. (Any Three) 06

- a) Give the examples of biomedical waste categories.
- b) List out the physical properties of solid waste.
- c) State the objective of Swachh Bharat Mission regarding solid waste management.
- d) Define pyrolysis.
- e) Define municipal solid waste.

Q.3 Answer the following. (Any Two) 06

- a) Discuss incineration technology for solid waste management.
- b) Define e-waste and give its sources.
- c) Describe zero waste initiatives.

Q.4 Answer the following. (Any Two) 06

- a) Explain various composting Technology for recycling of waste.
- b) Explain biogas production from solid waste.
- c) Mention two case studies in solid waste management from India.

Q.5 Answer the following. (Any One) 06

- a) Explain the processes of collection and transportation in solid waste management.
- b) Explain the principle of a sanitary landfill.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
BIO-CHEMISTRY - III
Nutrition And Metabolism (G04-DSC2-0425)**

Day & Date: Monday, 20-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams wherever necessary.

Q.1 Choose the correct alternative.**06**

- 1) One mole of ATP in hydrolysis give _____ kcal energy.

a) 3.8	b) 8.3
c) 3.7	d) 7.3

- 2) Study of energy conversion and relationships in biological system is called as _____.

a) Bioinformatics	b) Bioenergetics
c) Biotechnology	d) Genetics

- 3) Beta oxidation is a process of breakdown of _____.

a) glucose	b) lipids
c) proteins	d) nucleic acid

- 4) _____ is the final product of purine degradation in mammals.

a) guanine	b) uric acid
c) inosine	d) hypoxanthine

- 5) Glycolysis can take place under _____ conditions.

a) Aerobic	b) Anaerobic
c) Both a and b	d) None of above

- 6) _____ buffer system is prominent buffer system of blood.

a) Protein	b) Phosphate
c) Bicarbonate	d) Haemoglobin

Q.2 Answer the following. (Any Three)**06**

- a) What are the sources of atoms in pyrimidine bases?
- b) What is respiratory quotient?
- c) Define transamination.
- d) Write the conversion of acetyl CoA to malonyl CoA.
- e) What is substrate level phosphorylation.

- Q.3 Answer the following. (Any Two) 06**
- a) Write a note on urea cycle.
 - b) Describe the degradation of purine nucleotides to uric acid.
 - c) Write a note on chemiosmotic coupling hypothesis.
- Q.4 Answer the following. (Any Two) 06**
- a) Write a note on energetics of beta oxidation of palmitic acid.
 - b) What is decarboxylation of amino acids? Give two reactions of decarboxylation of amino acids.
 - c) ATP as high energy compound. Explain
- Q.5 Answer the following. (Any One) 06**
- a) Write and explain the reactions of energy yielding phase of glycolysis.
 - b) Define nutrition and BMR. Discuss the factors affecting BMR.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
GEO-CHEMISTRY - III
Principles of Geochemistry (G04-DSC2-0427)**

Day & Date: Monday, 20-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:**
- 1) All questions are compulsory.
 - 2) Draw neat diagrams and give equations wherever necessary.
 - 3) Figures to the right indicate full marks.
 - 4) Use of logarithmic table and calculator is allowed.

Q.1 Choose the correct alternatives from the options.**06**

- 1) Le Chatelier's principle is independent on _____.

a) concentration	b) pressure
c) catalyst	d) temperature

- 2) Alkenes possess _____ bonds.

a) only single	b) only double
c) both single and double	d) triple

- 3) The pH scale is _____.

a) 0 to 7	b) 7 to 14
c) 0 to 14	d) -14 to +14

- 4) Major role of carbon compounds in geological processes _____.

a) Oxidizing agents	b) Reducing agents
c) Catalysts	d) Inhibitors

- 5) Atoms of the same element with different numbers of neutrons are referred as _____.

a) Isotopes	b) Isobars
c) Isotones	d) Isochores

- 6) _____ is the primary form of carbon in sedimentary rocks.

a) Graphite	b) Diamond
c) Organic matter	d) Carbonate minerals

Q.2 Answer the following. (Any Three)**06**

- a) What is difference between isotopes and isobars.
- b) State Law of mass action.
- c) Mention any two equilibrium reactions.
- d) Define chemical equilibrium
- e) What is the significance of organic matter in black shale?

- Q.3 Answer the following. (Any Two) 06**
- a) With the help of reactions, explain hydrolysis of Na_2CO_3 .
 - b) Write a note on origin of petroleum.
 - c) Compare radioactive and radiogenic isotopes.
- Q.4 Answer the following. (Any Two) 06**
- a) Describe chemical equilibrium between CO_2 in water and calcium sulphate.
 - b) Illustrate law of mass action with the help of suitable example.
 - c) Discuss Van't Hoff isotherm equation.
- Q.5 Answer the following. (Any One) 06**
- a) Describe carbon compounds as reducing agents.
 - b) Taking an example of lead, explain the concept of stable isotopes.

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Set **P**

**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
PLANT PROTECTION - V
Introduction to Weeds & Non-Insect Pests (G04-DSC2-0429)**

Day & Date: Monday, 20-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.**06**

- 1) *Cynodon dactylon* is a _____ weed.
 - a) Dicot
 - b) Monocot
 - c) Sticky
 - d) Poisonous

- 2) _____ is a dicot weed.
 - a) *Cynodon dactylon*
 - b) *Cyperus rotundus*
 - c) *Parthenium hysterophorus*
 - d) None of these

- 3) Weedicides are used to control _____.
 - a) Unwanted plant growth
 - b) Crop plant growth
 - c) Tall plant growth
 - d) Height

- 4) Field Sanitation means _____.
 - a) Spraying of detergents on weeds
 - b) Keeping the field clean by remaining weeds
 - c) Spraying of insecticides on weeds
 - d) Spraying of perfumes on weeds

- 5) Mites control made by dusting of _____.
 - a) BHC powder
 - b) Boron powder
 - c) Chlorine powder
 - d) Sodium powder

- 6) Nylon nets are used to protect, fruits or _____.
 - a) Xanthium
 - b) Neem
 - c) Citrus
 - d) Pomegranates

Q.2 Answer the following. (Any Three)**06**

- a) Definition Weeds.
- b) Write on biological control.
- c) What are Poisonous Weeds?
- d) What are nematodes?
- e) What are snails?

- Q.3 Answer the following. (Any Two) 06**
- a) Explain in brief - Ploughing
 - b) Perennial Weeds
 - c) Write on natural of damage & management caused by birds.
- Q.4 Answer the following. (Any Two) 06**
- a) Give the classification of weeds based on crop association.
 - b) Give the losses caused by Weeds.
 - c) Give the mode of action & uses of 2,4 - D.
- Q.5 Answer the following. (Any One) 06**
- a) Give the gross morphology, reproduction, ecology, dispersal & management of *Cynodon dactylon*.
 - b) Give the preparation, mode of action, formulation & use of Mira - 71.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
METEOROLOGY - V
Meteorology (G04-DSC2-0431)**

Day & Date: Monday, 20-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternative:

06

- 1) The abbreviation cT stands for _____.
a) Continental tropical air mass b) Coastal temperate air mass
c) Cyclonic Temperature d) Continental trough
- 2) Air masses are mainly identified by their _____.
a) Temperature and humidity b) Pressure and salinity
c) Latitude and longitude d) Cloud type only
- 3) Modification of air mass occurs due to _____.
a) Underlying surface conditions
b) Earthquake activity
c) Rotation of crops
d) Ocean tides only
- 4) The final weakening stage of a cyclone is called _____.
a) Intensification b) Maturity
c) Decay d) Source stage
- 5) Descending air and clear skies are associated with _____.
a) Cyclone b) Anticyclone
c) Depression d) Monsoon trough
- 6) Seasonal disturbances in India are closely related to _____.
a) Monsoon weather b) Ocean currents only
c) Soil erosion only d) Forest types only

Q.2 Answer the following. (Any Three)

06

- a) What is continental polar air mass?
- b) Mention any two factors affecting air mass modification.
- c) What is jet stream?
- d) Define cyclonic depression.
- e) Mention any two weather conditions associated with anticyclones.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the importance of source regions in air mass formation.
 - b) Describe the life cycle of a cyclone in brief.
 - c) How does upper air circulation influence atmospheric conditions?
- Q.4 Answer the following. (Any Two) 06**
- a) Write a short note on the modification of air masses by the underlying surface.
 - b) Explain the origin and development of anticyclones.
 - c) Describe the role of cyclonic depressions in the Indian monsoon.
- Q.5 Answer the following. (Any One) 06**
- a) Discuss the relation between air masses and upper air circulation in weather analysis.
 - b) Explain theories of the origin of cyclonic depressions and their climatic importance.

- Q.3 Answer the following. (Any Two) 06**
- a) Describe the working principle of a spectrophotometer.
 - b) Explain plasma display.
 - c) Describe thermocouple as a temperature transducer.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain spectroscopy and mention its types.
 - b) Write applications of display devices.
 - c) Describe the working principle of a digital balance.
- Q.5 Answer the following. (Any One) 06**
- a) Explain the principle, construction and applications of a microscope.
 - b) Explain optical transducers with reference to LDR and photodiode.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
CHEMISTRY
General Chemistry - IV (General Inorganic Chemistry)
(G04-DSC2-0404)**

Day & Date: Tuesday, 21-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary
3) Figures to the right indicate full marks.

Q.1 Choose correct alternatives.**06**

- 1) Magnetic quantum number (m) represents _____.
 - a) shape of orbital
 - b) spin of electron
 - c) orientation of orbital
 - d) magnetic field

- 2) Hard acid prefers to bind with _____.
 - a) soft base
 - b) hard base
 - c) soft acid
 - d) all of these

- 3) Inorganic polymers are characterized by having _____.
 - a) No carbon atom in their backbone
 - b) only carbon atom in their backbone
 - c) only silicone atoms in their backbone
 - d) carbon atoms with attached organic groups

- 4) Solutions of alkali metals in liquid ammonia are _____ in colour.
 - a) yellow
 - b) deep blue
 - c) pink
 - d) orange

- 5) Elements having low ionization potential values are _____.
 - a) less reactive
 - b) inert
 - c) more reactive
 - d) all of these

- 6) General electronic configuration of III A group elements is _____.
 - a) $ns^2 np^1$
 - b) $ns^2 np^2$
 - c) $ns^2 np^3$
 - d) $ns^1 np^2$

- Q.2 Answer the following. (Any Three) 06**
- a) State the Pearson's HSAB principle.
 - b) What is silicone and phosphazene.
 - c) Define Lewis acid and Lewis base with examples.
 - d) Why alkali metals in liquid ammonia show good reducing agents.
 - e) Define the terms:
 - i) atomic radius
 - ii) ionic radius
- Q.3 Answer the following. (Any Two) 06**
- a) State and explain Pauli's exclusion principle.
 - b) Describe hard acid and soft acid according to Pearson's concept.
 - c) Distinguish between organic and inorganic polymers.
- Q.4 Answer the following. (Any Two) 06**
- a) Give merits of Lewis concept.
 - b) Write a short note on phosphonitrilic compounds.
 - c) Draw and discuss shapes of 's' and 'p' orbitals
- Q.5 Answer the following. (Any One) 06**
- a) Write the names and electronic configuration of IA and IIA group elements.
 - b) Give classification of solvents on the basis of physical and chemical properties.

- Q.3 Answer the following. (Any Two) 06**
- a) Give the merits and demerits of contact process.
 - b) Explain the Paper Chromatography.
 - c) Describe general steps involved in gravimetric analysis.
- Q.4 Answer the following. (Any Two) 06**
- a) Give the advantages and disadvantages of organic precipitants.
 - b) Explain the physico-chemicals principle of contact process.
 - c) Give the general principles of Chromatography.
- Q.5 Answer the following. (Any One) 06**
- a) Explain the manufacturing of ammonia by Haber's process with neat labeled diagram.
 - b) Discuss the Ostwald's and Quinoid theory.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
General Chemistry - IV
Pigments, Solvents and Additives (G04-DSC2-0434)**

Day & Date: Tuesday, 21-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) The figure to the right indicates full marks.

Q.1 Choose the correct alternatives.**06**

- 1) Solvents in paints are mainly used to _____.
 - a) Provide colour
 - b) Dissolve binders
 - c) Increase hardness
 - d) Prevent corrosion
- 2) The rate of evaporation of solvents affects _____.
 - a) Colour of paint
 - b) Drying time of paint
 - c) Hardness of pigment
 - d) Density
- 3) Thinners are used to _____.
 - a) Increase viscosity
 - b) Reduce viscosity
 - c) Increase colour
 - d) Increase density
- 4) Carbon black is mainly used for _____.
 - a) White colour
 - b) Blue colour
 - c) Black colour
 - d) Green colour
- 5) Calcium carbonate is mainly used as _____.
 - a) Pigment extender
 - b) Binder
 - c) Solvent
 - d) Plasticizer
- 6) Chrome pigments are generally based on _____.
 - a) Chromium compounds
 - b) Iron compounds
 - c) Copper compounds
 - d) Zinc compounds

Q.2 Answer the following. (Any Three)**06**

- a) Define pigments.
- b) What are extenders?
- c) Define solvent index.
- d) What is the role of TiO_2 in paints?
- e) What are diluents?

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the role of dryers in paints.
 - b) Write down Characteristics of Solvents.
 - c) Explain the role of UV light stabilizers and biocides in paints.
- Q.4 Answer the following. (Any Two) 06**
- a) Write down the types of solvents.
 - b) Explain the classification and characteristics of organic pigments.
 - c) Discuss Calcium Carbonate (CaCO_3) and Barium Sulphate (BaSO_4) as extenders.
- Q.5 Answer the following. (Any One) 06**
- a) Explain the relationship between colour and the structure of pigments.
 - b) Explain paint additives and their functions with examples.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
BOTANY
Food Adulteration (G04-DSC2-0406)**

Day & Date: Tuesday, 21-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw Neat labelled diagrams wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Multiple Choice Question.**06**

- 1) Adding chalk powder to flour falls under _____ Category.
 - a) Incidental adulteration
 - b) Metallic Contamination
 - c) Intentional adulteration
 - d) Packaging hazard
- 2) Antioxidants are food additives that prevent the degradation of food by _____.
 - a) Foaming
 - b) Bulking
 - c) Oxygen
 - d) Flavor enhancement
- 3) _____ of the following is a voluntary certification scheme for agricultural commodities in India.
 - a) FSSAI License
 - b) AGMARK
 - c) FPO Mark
 - d) Both b & c
- 4) _____ of these is a key physical test for sugar purity, where adulterants fail the test.
 - a) Flame test
 - b) Solubility test in water
 - c) Iodine test
 - d) Smell test with vinegar
- 5) A substance intentionally added to food to preserve flavor or improve taste is called _____.
 - a) Food adulterant
 - b) Food contaminant
 - c) Food additive
 - d) Food colour
- 6) _____ is the apex food regulator in India.
 - a) Ministry of Health & Family Welfare
 - b) Department of Consumer Affairs
 - c) FSSAI (Food Safety and Standards Authority of India)
 - d) AGMARK

- Q.2 Answer any three of the following. 06**
- a) What is intentional food adulteration?
 - b) Define adulteration.
 - c) What are antioxidants?
 - d) Define food additives.
 - e) What is meant by preservatives?
- Q.3 Answer any two of the following. 06**
- a) Write method of detection of adulteration in processed food.
 - b) Give uses of safe level additives.
 - c) Write a note on causes of food adulteration.
- Q.4 Answer any two of the following. 06**
- a) Explain method of detection of adulteration in grain.
 - b) Give general impact on human health of food adulteration
 - c) Give role of additives in processed foods.
- Q.5 Answer any one of the following. 06**
- a) Explain different preventive measures of food adulteration.
 - b) Explain the role of FSSAI for maintaining food safety.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
ZOOLOGY
Endocrinology (G04-DSC2-0408)**

Day & Date: Tuesday, 21-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw neat labelled diagrams wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Choose correct alternatives.

06

- 1) Hormones are secreted by _____.
a) Exocrine glands b) Endocrine glands
c) Sweat glands d) Salivary glands
- 2) Aldosterone hormone is secreted by _____.
a) Thyroid gland b) Pituitary gland
c) Adrenal gland d) Pancreas gland
- 3) Sex hormones are chemically _____ in nature.
a) Protein b) Lipid
c) Steroids d) carbohydrate
- 4) Cholecystokinin stimulates _____.
a) Insulin release b) Thyroxine
c) Growth hormone d) Gall bladder contraction
- 5) Erythropoietin hormone stimulates _____.
a) WBC production b) RBC production
c) Platelets d) Hormones
- 6) Goiter disease causes due to deficiency of _____.
a) Calcium b) iron
c) Iodin d) Vit-D

Q.2 Answer the following. (Any Three)

06

- a) Risk of hormonal of Hormone replacement therapy
- b) Growth hormone
- c) Lactation
- d) Function of Rennin hormone
- e) Hyperthyroidism

- Q.3 Answer the following. (Any Two) 06**
- a) Write note on Hormone replacement therapy.
 - b) Write note on scope of endocrinology.
 - c) Explain Hormonal control of pregnancy.
- Q.4 Answer the following. (Any Two) 06**
- a) Write note on chemical composition & functions of testosterone.
 - b) What is secretin? Write functions of secretin hormone.
 - c) Write note on protein hormones.
- Q.5 Answer the following. (Any One) 06**
- a) Explain in detail the female sex hormones.
 - b) Explain the Pituitary hormones and its disorders.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
ELECTRONICS
Sensors and Transducers (G04-DSC2-0410)**

Day & Date: Tuesday, 21-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose correct alternatives.

06

- 1) The main purpose of measurement is to _____.
 - a) Control power
 - b) Compare unknown quantity with standard
 - c) Store data
 - d) Increase accuracy

- 2) _____ is a static characteristic.

a) Speed of response	b) Lag
c) Sensitivity	d) Fidelity

- 3) Calibration of instruments is required to _____.

a) Increase size	b) Reduce cost
c) Reduce power	d) Improve accuracy

- 4) _____ transducer generates its own electrical output.

a) Passive	b) Active
c) Secondary	d) Digital

- 5) LDR works on principle of _____.

a) Resistance change	b) Capacitance change
c) Inductance change	d) Voltage change

- 6) PIR sensor is mainly used for _____.

a) Temperature sensing	b) Light detection
c) Motion detection	d) Pressure measurement

Q.2 Answer the following. (Any Three)

06

- a) Explain basic need of measurements.
- b) Draw the block diagram of measurement system.
- c) Define instrumentation.
- d) State the types of mechanical instruments.
- e) Define accuracy and error.

- Q.3 Answer the following. (Any Two) 06**
- a) Write static characteristics of measurement system.
 - b) Explain active and passive transducers with examples.
 - c) Give the working principle of photocell.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain in brief working principal of Thermistor.
 - b) State the applications of LDR.
 - c) Explain working principal of Ultrasonic sensor.
- Q.5 Answer the following. (Any One) 06**
- a) Explain construction, working of LVDT.
 - b) What is transducers. Give the classification of transducers in detail.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
Microbiology
Industrial Microbiology (G04-DSC2-0412)**

Day & Date: Tuesday, 21-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives.

06

- 1) Which type of fermentation involves the growth of microorganisms on solid or semi-solid media without free water?
 - a) Submerged fermentation
 - b) Batch fermentation
 - c) Surface fermentation
 - d) Continuous fermentation
- 2) The fermentation media primarily provide _____ for Microorganisms.
 - a) Antibiotics
 - b) Growth inhibitors
 - c) Nutrients
 - d) Genetic material
- 3) The media optimization aims to _____.
 - a) Reduce microbial growth
 - b) Maximize product yield
 - c) Increase contamination
 - d) Eliminate nutrients
- 4) The primary screening mainly identifies microorganisms based on _____.
 - a) Genetic makeup
 - b) Product quantity
 - c) Presence or absence of activity
 - d) Fermenter performance
- 5) Which method is commonly used for strain improvement?
 - a) Pasteurization
 - b) Mutation and selection
 - c) Sterilization
 - d) Filtration
- 6) The main goal of scale-up in fermentation is to _____.
 - a) Reduce volume
 - b) Transfer the lab process to an industrial level
 - c) Stop fermentation
 - d) Increase contamination

- Q.2 Answer the following. (Any Three) 06**
- a) Define fermentation.
 - b) Write any two applications of SCP.
 - c) Give the different examples of fermentation media.
 - d) Define strain improvement.
 - e) Write the name of the medium used for the production of alcohol.
- Q.3 Answer the following. (Any Two) 06**
- a) Describe the submerged culture fermentation process.
 - b) Write a note on the use of waste as a fermentation medium.
 - c) Explain primary and secondary screening of microorganisms.
- Q.4 Answer the following. (Any Two) 06**
- a) Define Scale-up of Fermentation and write the information on laboratory scale-up.
 - b) Describe the various methods for preservation of industrially important microorganisms.
 - c) Draw a neat labelled diagram of the design of a typical Fermenter and highlight the various parts of the fermenter.
- Q.5 Answer the following. (Any One) 06**
- a) Describe in detail the penicillin fermentation process.
 - b) Explain the continuous culture process with reference to the chemostat and turbidostat.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
GEOGRAPHY
Population Geography (G04-DSC2-0414)**

Day & Date: Tuesday, 21-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw Neat diagrams wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Choose correct alternatives.**06**

- 1) _____ Geographical factor is influencing population distribution.
 - a) Religion
 - b) Government policy
 - c) War
 - d) Climate
- 2) _____ state has highest literacy rate of India.
 - a) Maharashtra
 - b) Uttar Pradesh
 - c) Bihar
 - d) Kerala
- 3) _____ is a father of Human Geography.
 - a) Zelinsky
 - b) P. Geddes
 - c) F. Ratzel
 - d) Thomas Robert Malthus
- 4) _____ cultural factor that affecting the distribution of population.
 - a) Topography
 - b) Religion
 - c) Climate
 - d) Natural vegetation
- 5) The Indian population has decreases rapidly in the decade of _____.
 - a) 1901-1910
 - b) 1921-1930
 - c) 1951-1960
 - d) 1981-1990
- 6) In India first successive census was conducted in the year _____.
 - a) 1861
 - b) 1871
 - c) 1881
 - d) 1891

Q.2 Answer the following. (Any Three)**06**

- a) Define the concept of Population Geography
- b) Define the concept of population density.
- c) Define the concept of population.
- d) Define the concept of census.
- e) State the cultural factor affecting on density of population.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the approach in Population Geography.
 - b) Explain the physical factor affecting on population distribution.
 - c) Explain the importance of Population Geography.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain the nature of Population Geography.
 - b) Explain the population density of India.
 - c) Explain the physical factors affecting on population distribution.
- Q.5 Answer the following. (Any One) 06**
- a) Explain scope of Population Geography.
 - b) Explain the world population distribution.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
Computer Science
Software Testing (G04-DSC2-0416)**

Day & Date: Tuesday, 21-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw Neat labelled diagrams wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Multiple Choice Questions.

06

- 1) Which testing ensures the system can handle a massive amount of data?
 - a) Load Testing
 - b) Unit Testing
 - c) Stress Testing
 - d) Volume Testing
- 2) 'Inspection' is a formal type of _____.
 - a) Dynamic Testing
 - b) Static Testing
 - c) Black Box Testing
 - d) Regression Testing
- 3) Cause-Effect Graphing is a type of _____.
 - a) White Box
 - b) Performance
 - c) Experience-based
 - d) Black Box
- 4) The goal of Smoke Testing is to _____.
 - a) Find all bugs
 - b) Check build stability
 - c) Check performance
 - d) Test data security
- 5) Which document is prepared at the end of the testing process?
 - a) Test Summary Report
 - b) Test Plan
 - c) RTM
 - d) Requirement Doc
- 6) Path coverage is a _____ technique.
 - a) Black Box
 - b) Functional
 - c) Structural
 - d) Non-functional

Q.2 Attempt any Three of the following.

06

- a) Define Static Testing and its importance.
- b) What is Exploratory Testing?
- c) What Recovery Testing?
- d) What is the difference between a Defect and a Failure?
- e) What are the advantages of White Box Testing?

- Q.3 Attempt any Two of the following. 06**
- a) Explain Equivalence Class Partitioning (ECP) with an example.
 - b) Discuss Decision Table Testing with example.
 - c) Difference between Regional Regression Testing and Full Regression Testing.
- Q.4 Attempt any Two of the following. 06**
- a) Explain the importance of the Requirement Traceability Matrix (RTM).
 - b) Describe Bottom-Up Integration testing with example.
 - c) Explain system testing and its importance.
- Q.5 Attempt any One of the following. 06**
- a) Explain different types of Performance Testing.
 - b) Describe the Defect Life Cycle (Bug Life Cycle).

- Q.3 Answer any two from the following. 06**
- a) Describe the condition of fossilization.
 - b) Describe the petrification mode of preservation.
 - c) Draw a neat labeled diagram of gastropod cell.
- Q.4 Answer any two from the following. 06**
- a) Describe the types of Coiling in nautilus.
 - b) Draw a neat labeled diagram of Echinoderm cell.
 - c) Describe cephalon of trilobites.
- Q.5 Answer any one from the following. 06**
- a) Describe the uses of fossils.
 - b) Explain the imprints, mould & cast and track & trails mode of preservation of fossils.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April - 2026
MATHEMATICS
Introduction to Abstract Algebra (G04-DSC2-0420)**

Day & Date: Tuesday, 21-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative of the following.**06**

- 1) A group $(Z, +)$ has _____ subgroups.
 - a) 0
 - b) 1
 - c) finite
 - d) infinite
- 2) The number of divisors of 20 are _____.
 - a) 6
 - b) 8
 - c) 10
 - d) 12
- 3) If $2x \equiv x \pmod{6}$ then $x =$ _____.
 - a) $\{0\}$
 - b) $\{5\}$
 - c) $\{2, 7\}$
 - d) $\{1, 2, 3, 4\}$
- 4) Which of the following is generator of group $(\{1, -1, i, -i\}, \times)$?
 - a) 1
 - b) $-i$
 - c) -1
 - d) i^2
- 5) In group S_3 , $(1\ 2\ 3)$ is _____.
 - a) 1
 - b) 2
 - c) 3
 - d) 4
- 6) The order of quotient group $\frac{Z_8}{\langle 3 \rangle}$ is _____.
 - a) 3
 - b) 4
 - c) 6
 - d) 8

Q.2 Answer the following. (Any Three)**06**

- a) Prove that centralizer of an element a in group G is subgroup of G .
- b) Define equivalence relation and partition of set.
- c) Simplify each of the following expression in group $(Z_5^{\#}, \times)$.
 - i) $[17] \oplus [76]$
 - ii) $[3] \odot [4]$
- d) Find all generators of group (Z_{10}, \oplus)
- e) Define group homomorphism and normal subgroups of group.

Q.3 Answer the following. (Any Two) 06

- a) Show that, every homomorphic image of Abelian group is Abelian.
- b) Prove that, if a is generator of a cyclic group G then a^{-1} is also generator of G .
- c) Construct Cayley table for group (Z_6, \oplus) .

Q.4 Answer the following. (Any Two) 06

- a) State and prove Lagrange's theorem.
- b) Find greatest common divisor and least common multiple of the set $\{24, -60, 120\}$
- c) Prove that, the set of all even permutations A_n in S_n forms subgroup of $S_n \forall n \geq 2$. Find order of A_n in S_n .

Q.5 Answer the following. (Any One) 06

- a) State and prove Cayley's theorem.

- b) For that two groups, $(G, *)$ and (\bar{G}, \cdot)

Let the mapping, $f: G \rightarrow \bar{G}$ is defined as $f(a * b) = f(a) \cdot f(b) \forall a, b \in G$

Then, prove that,

- i) $f(e) = e^1$
- ii) $f(x^{-1}) = (f(x))^{-1} \forall x \in G$
- iii) $f(x^k) = (f(x))^k \forall x \in G, k \in \mathbb{Z}$
- iv) If f is one-to-one function, then $G \cong f(G)$

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
STATISTICS
Applied Statistics (G04-DSC2-0422)**

Day & Date: Tuesday, 21-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.

Q.1 Choose correct alternatives.**06**

- 1) The number of possible samples of size n from a population of N units by using SRSWOR is _____.
 - a) N^n
 - b) $\binom{N}{n}$
 - c) $n!$
 - d) None of these
- 2) In case of SRSWOR of size 10 with population size 50, probability of selecting unit no. 5 at 3rd draw is _____.
 - a) $\frac{1}{5}$
 - b) $\frac{1}{50}$
 - c) $\frac{1}{10}$
 - d) $\frac{1}{48}$
- 3) The death rate obtained for a segment of a population is known as _____.
 - a) Specific death rate
 - b) Crude death rate
 - c) Standardized rate
 - d) Vital index
- 4) IF $N.R.R. > 1$ then we interpret that _____.
 - a) increase in population
 - b) reduction in population
 - c) constancy in population
 - d) All the above
- 5) The Corr $(X_{1.3}, X_{2.3})$ is _____.
 - a) r_{12}
 - b) r_{13}
 - c) $r_{12.3}$
 - d) $r_{13.2}$
- 6) The range of partial correlation coefficient is _____.
 - a) -1 to 1
 - b) 0 to 1
 - c) $-\infty$ to ∞
 - d) 0 to ∞

Q.2 Answer the following. (Any Three) 06

- a) Define sampling unit and give its example.
- b) Define multiple correlation coefficient.
- c) Define General Fertility Rate (GFR).
- d) State variance of sample mean in case of SRSWOR.
- e) Define Crude Death Rate (CDR).

Q.3 Answer the following. (Any Two) 06

- a) With usual notations prove that,

$$1 - R^2_{1.23} = (1 - r^2_{12})(1 - r^2_{13.2})$$
- b) Show that sample mean is unbiased estimator of population mean in case of SRSWOR.
- c) Explain deliberate sampling and probability sampling.

Q.4 Answer the following. (Any Two) 06

- a) Define Crude Birth Rate (CBR) and Age Specific Fertility Rate (ASFR).
- b) Explain simple random sampling without replacement.
- c) State and prove any two properties of residuals.

Q.5 Answer the following. (Any One) 06

- a) Derive the equation of the least square plane of regression equation of X_1 on X_2 and X_3 .
- b) With usual notations, prove that

$$\text{var}(\bar{y}_n)_{wr} = \frac{N-1}{Nn} S^2$$

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
Environmental Science
Environmental Microbiology (G04-DSC2-0424)**

Day & Date: Tuesday, 21-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.

Q.1 Choose correct alternative.

06

- 1) Bioremediation is best defined as _____.
 - a) Use of chemicals to neutralize pollutants
 - b) Use of microorganisms to degrade environmental pollutants
 - c) Physical removal of contaminants by excavation
 - d) Use of genetically modified plants only

- 2) Microorganisms play a major role in the environment mainly because they are involved in _____.
 - a) Only disease transmission
 - b) Nutrient cycling and decomposition
 - c) Only industrial fermentation
 - d) Physical weathering of rocks

- 3) Which of the following is NOT considered a major group of microorganisms?
 - a) Bacteria
 - b) Fungi
 - c) Protozoa
 - d) Algae

- 4) Which of the following is a characteristic of cyanobacteria?
 - a) They are obligate pathogens
 - b) They perform oxygenic photosynthesis
 - c) They lack a cell wall
 - d) They are obligate anaerobes

- 5) Symbiosis is best defined as _____.
 - a) Any interaction between two organisms
 - b) Two organisms of the same species living together
 - c) Living together of two organisms of different species in a close long-term association
 - d) Only mutualistic relationships

- 6) Which of the following is a classic water-borne bacterial disease?
 - a) Dengue
 - b) Cholera
 - c) Tuberculosis
 - d) Malaria

- Q.2 Answer the following. (Any Three) 06**
- a) What are bio-fertilizers?
 - b) List common waterborne diseases.
 - c) Define bio-aerosols and give two examples of microbial sources in indoor air.
 - d) Give two examples each of pathogenic bacteria commonly found in water.
 - e) Define bioremediation.
- Q.3 Answer the following. (Any Two) 06**
- a) Enumerate the important environmental factors affecting microbial activity during composting.
 - b) Describe the role of microorganisms in biogeochemical cycles.
 - c) Describe microbial waste treatment processes.
- Q.4 Answer the following. (Any Two) 06**
- a) Compare the advantages of bio-fertilizers over chemical fertilizers.
 - b) Describe the commonly used microbiological tests for water quality.
 - c) Define symbiosis and describe its major types.
- Q.5 Answer the following. (Any One) 06**
- a) Explain the role of microorganisms in composting.
 - b) Define environmental microbiology and briefly explain its scope.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain Lock and Key hypothesis.
 - b) Discuss about anti-AIDS drugs.
 - c) Explain competitive inhibition of an enzyme.
- Q.4 Answer the following. (Any Two) 06**
- a) Write three applications of genetic engineering.
 - b) Discuss the ways in which HIV transmission takes place.
 - c) Write a note on non-insulin dependent diabetes mellitus (NIDDM).
- Q.5 Answer the following. (Any One) 06**
- a) Describe the structure of Immunoglobulin G (IgG) in detail.
 - b) Explain the process of transcription in prokaryotes in detail.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
GEOCHEMISTRY (Paper- IV)
Chemistry of the Earth (G04-DSC2-0428)**

Day & Date: Tuesday, 21-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory
2) Figures to the right indicate full marks.

Q.1 Fill in the blanks with correct answer from given options.

06

- 1) According to Goldsmith, clay mineral is classified as _____.
 - a) Resistates
 - b) Hydrolysates
 - c) Oxidates
 - d) Evaporates
- 2) The element may have differing neutrons in the nucleus hence may have different atomic weight having differing chemical and physical properties they are termed as _____.
 - a) Ions
 - b) Isobars
 - c) Isotopes
 - d) Isochrons
- 3) The transformation from parent rock to soil is generally accompanied by _____.
 - a) Decrease in Ca, Mg, Na and K and increase in Si
 - b) Increase in Ca, Mg, Na and K and decrease in Si
 - c) Much loss of Al and Fe
 - d) No change in parent composition
- 4) Ionic potential is _____.
 - a) Charge on the ions
 - b) Charge multiplied by radius
 - c) Charge divided by radius
 - d) Radius divided by charge
- 5) Smoke, fumes, ash, dust, nitric oxide and sulphur dioxide are the main sources of _____.
 - a) Primary Pollutants
 - b) Secondary pollutants
 - c) Bio-Degradable Pollutants
 - d) None of the above
- 6) The upper crust of the earth mainly consists of _____.
 - a) Sandstone
 - b) Shale
 - c) Limestone
 - d) Igneous and metamorphic rocks

- Q.2 Answer the following. (Any Three) 06**
- a) Name the two types of clay structure.
 - b) Give two methods of radioactive dating used to determine the age of older rocks.
 - c) Define Ionic potential.
 - d) Give the factors affecting the rate of formation of soil are
 - e) Define Geochronology.
- Q.3 Answer the following. (Any Two) 06**
- a) Write short note on Redox potential.
 - b) Discuss the significance of Isotopes.
 - c) Describe in detail Physicochemical system of the earth.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain the geochemical cycle with neat labeled diagram.
 - b) Describe in brief the Soil horizon.
 - c) Write note on elemental mobility in surface environment.
- Q.5 Answer the following. (Any One) 06**
- a) Explain in brief origin, structure and types of clay minerals with suitable diagram.
 - b) Define pollution. Describe the primary and secondary pollutants of air.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
Plant Protection
Insect Pests and their Management (G04-DSC2-0430)**

Day & Date: Tuesday, 21-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.
2) Draw a well diagrams wherever necessary.
3) All question Carry equal marks.

Q.1 Multiple Choice Question.

06

- 1) Developmental stage from birth to adult is called _____.
a) Gametogenesis b) Metamorphosis
c) Homogenises d) Evolution
- 2) Carbamates include _____.
a) Fungicides, herbicides and insecticides
b) Insecticides only
c) Herbicides, insecticides and nematicides
d) Insecticides and rodenticides
- 3) Rocker Sprayer is also called as _____.
a) Knapsack Sprayer b) Hand sprayer
c) Gator Pump d) Spray guns
- 4) Cultural controls of insects include which of the following _____.
a) crop rotation
b) tillage methods
c) resistant or tolerate varieties
d) all of the above
- 5) The use of legislative restriction to control pests is called _____.
a) plant quarantine b) Plant law
c) Plant enclosure d) Plant protection
- 6) _____ Scientific name of stem borer.
a) *Chillo zonellus* b) *Heliothis armigera*
c) *Sitophilus oryzae* d) *Chrotogonus trachyptnus*

- Q.2 Answer any Three of the following. 06**
- a) Metamorphosis
 - b) Mention two name of stored grain insect pest.
 - c) Write the classification of insecticides.
 - d) Write any two chemical pest control.
 - e) Mention nature of formulation in the pest management.
- Q.3 Write short note on any TWO of the following. 06**
- a) Nature of damage of fruit borer
 - b) Control measures of trips of rose plant
 - c) Repellents
- Q.4 Answer any TWO of the following. 06**
- a) General characters of typical insect pest.
 - b) Give an account on classification of insect pest.
 - c) Write the principles of insect pest control.
- Q.5 Answer any ONE of the following. 06**
- a) Describe in details about pulse beetle.
 - b) Give an account on Woolly aphids of sugarcane.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
Meteorology
Meteorological Instruments (G04-DSC2-0432)**

Day & Date: Tuesday, 21-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
3) Figures to right indicate full marks.

Q.1 Choose correct alternatives.**06**

- 1) Water drops falling on the earth's surface in any of the forms is commonly called as _____.
 - a) dew
 - b) condensation
 - c) cyclone
 - d) precipitation
- 2) The centigrade and Fahrenheit scales coincide at _____ temperature.
 - a) - 10
 - b) - 5
 - c) - 40
 - d) - 50
- 3) Minimum and maximum temperature is measured using _____.
 - a) precipitation thermometer
 - b) mercury thermometer
 - c) Six's thermometer
 - d) mercury barometer
- 4) Which of the following instrument is used to measure humidity?
 - a) hair hygrometer
 - b) ether thermoscope
 - c) mercury thermometer
 - d) Crookes radiometer
- 5) An anemometer is used to measure _____.
 - a) wind speed
 - b) humidity
 - c) sunshine
 - d) radiation
- 6) Ether thermoscope is used to detect _____.
 - a) wind speed
 - b) radiations
 - c) air density
 - d) moisture

Q.2 Answer the following. (Any Three)**06**

- a) What is atmospheric pressure?
- b) Why is mercury used in thermometers?
- c) What is thermograph?
- d) State principle of working of hair hygrometer.
- e) Why winds blow?

- Q.3 Answer the following. (Any Two) 06**
- a) Draw neat labeled diagram of thermograph.
 - b) How are constants of cup anemometer determined?
 - c) Draw neat labelled diagram of Crookes radiometer.
- Q.4 Answer the following. (Any Two) 06**
- a) Discuss different temperature scales.
 - b) With neat diagram explain working of Automatic siphon gauge.
 - c) Explain construction and working of splayed wind vane.
- Q.5 Answer the following. (Any One) 06**
- a) With neat diagram explain construction and working of mercury barometer.
 - b) With neat labelled diagram explain construction and working of ether thermoscope.

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**B.Sc. (Plain) (Semester - IV) (New) (NEP CBCS) Examination:
March/April – 2026
ENVIRONMENTAL SCIENCE -VI
Climatology and Meteorology (G04-DSC1-0424)**

Day & Date: Saturday, 18-04-2026
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives from the options. 06

- 1) El-Nino is associated with _____.
 - a) Cooling of Pacific Ocean
 - b) Warming of Pacific Ocean
 - c) Indian ocean currents
 - d) Atlantic Ocean

- 2) Cyclones are formed in _____.
 - a) High pressure area
 - b) Low pressure area
 - c) Neutral Pressure
 - d) Mountains

- 3) Hygrometer Measures _____.
 - a) Pressure
 - b) Temperature
 - c) Humidity
 - d) Wind speed

- 4) Clouds are formed due to _____.
 - a) Evaporation
 - b) Condensation
 - c) Radiation
 - d) Wind

- 5) Extreme weather events include _____.
 - a) Earthquakes
 - b) Floods and Cyclones
 - c) Volcanoes
 - d) Soil Erosion

- 6) Global warming is due to increase in _____.
 - a) Oxygen
 - b) Nitrogen
 - c) Greenhouse gases
 - d) Hydrogen

Q.2 Answer the following. (Any Three) 06

- a) Write applications of climatology.
- b) Define and explain dew point
- c) Explain any two types of cloud.
- d) Define and explain wind.
- e) What is relative humidity?

- Q.3 Answer the following. (Any Two) 06**
- a) Mention factors affecting rainfall.
 - b) Define climate change and write its causes
 - c) Explain role of climatology in agriculture.
- Q.4 Answer the following. (Any Two) 06**
- a) What is barometer? explain in detail.
 - b) Discuss in detail global heat distribution.
 - c) What is a cyclone? Explain.
- Q.5 Answer the following. (Any One) 06**
- a) Write a detailed note on humidity and precipitation.
 - b) Discuss El-Nino and La-Nina Phenomena with their importance.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April - 2026
DATA SCIENCE
Introduction to Data Science (G04-0213)**

Day & Date: Friday, 17-04-2026
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternatives. 06

- 1) Data Science mainly deals with _____.

a) Data storage	b) Data analysis
c) Computer repair	d) Web design
- 2) Which language is widely used in Data Science?

a) Python	b) HTML
c) C	d) Basic
- 3) Incomplete data may come from _____.

a) Human problems	b) Faulty data collection
c) Errors in transmission	d) Human errors
- 4) What is a correct syntax to create a Pandas DataFrame?

a) pd.df(data)	b) pd.DataFrame(data)
c) pd.dataframe(data)	d) pd.Dframe(data)
- 5) CSV file stands for _____.

a) Computer Standard Value	b) Comma Separated Value
c) Common System Variable	d) Control Stored Value
- 6) Data visualization helps in _____.

a) Hiding data	b) Understanding data
c) Deleting data	d) Encrypting data

Q.2 Answer the following. (Any Three) 06

- a) Define Data Science.
- b) What is data preprocessing?
- c) Who is data analyst?
- d) Give two applications of Data Science.
- e) What is Data Normalization?

Q.3 Answer the following. (Any Two)

06

- a) What is purpose of Data Transformation?
- b) Explain Data Science life cycle.
- c) For the given dataset of student scores. Write python code for the following:
 - 1) Remove duplicate entries.
 - 2) clean the data using Pandas.

Data:

Name	Score
Rahul	78
Meena	
Ajay	65
Gaurav	58
Dinesh	

Q.4 Answer the following (Any Two)

06

- a) Explain data visualization with examples.
- b) Explain Data Binning method in detail.
- c) Explain the use of ndarray in NumPy.

Q.5 Answer the following (Any One)

06

- a) Explain various methods of data collection.
- b) Write a Python script to create a data frame and display bar plot for the following table:

Name	Mobile_Sales	TV_Sales
Arun	2540	2200
Omkar	1370	1900
Anita	1320	2150
Lokesh	2000	1850
Sarita	2100	1770
Lila	2150	2000

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:
March/April – 2026
Geoinformatics - II (G04-0214)**

Day & Date: Saturday, 18-04-2026
Time: 03:00 PM To 4:30 PM

Max. Marks: 30

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative for the following. **06**

- 1) Cartography is mainly about _____.
 - a) Map making
 - b) Weather study
 - c) Soil study
 - d) Ocean waves
- 2) A map is a of the Earth _____.
 - a) Live video
 - b) Flat drawing
 - c) Building
 - d) Sound record
- 3) A large-scale map shows area _____.
 - a) Very big
 - b) Very small
 - c) Medium
 - d) Whole world
- 4) The scale 1: 25,000 is a _____.
 - a) Verbal scale
 - b) Graphical scale
 - c) Representative fraction (RF)
 - d) Time scale
- 5) Lines drawn east-west on a globe are called _____.
 - a) Longitudes
 - b) Latitudes
 - c) Rivers
 - d) Roads
- 6) In GIS, spatial reference helps to _____.
 - a) Colour the map
 - b) Play music
 - c) Put all layers in correct real-world position
 - d) Count the population

Q.2 Answer the following. (Any Three) **06**

- a) What is cartography? Write any two uses of cartography.
- b) What is a map? Write any two uses of maps.
- c) What is a large-scale map? Give one simple example.
- d) What is a defence series map? Write one use.
- e) What is representative fraction (RF)? Give one example.

Q.3 Answer the following. (Any two) 06

- a) Write any three differences between large-scale and small-scale maps.
- b) Write a short note on “conventional cartography” in simple words.
- c) Write a short note on “types of maps based on scale” in simple words.

Q.4 Answer the following. (Any Two) 06

- a) Explain “geographic coordinate system” in simple words.
- b) Explain “projected coordinate system” in simple words.
- c) What is a coordinate system? Why is it needed for maps?

Q.5 Answer the following. (Any One) 06

- a) Explain the three types of scales - verbal, fractional (RF) and graphical - in simple language.
- b) Explain with simple examples how geographic and projected coordinate systems are used in GIS.