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Set	P
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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Physics  
Energy Resources and Conservation (G04-GE-OE-101)**

Day & Date: Thursday, 06-11-2025  
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) Usable form of energy is called \_\_\_\_\_.
  - a) Primary
  - b) Secondary
  - c) Intermediate
  - d) Final energy
- 2) A solar cell converts \_\_\_\_\_.
  - a) solar energy into electrical energy in a. c. form
  - b) solar energy into electrical energy in d. c. form
  - c) solar energy into electrical energy in both a. c. and d. c. forms
  - d) None of these
- 3) For HWAT, the rotating shaft axis is \_\_\_\_\_.
  - a) vertical
  - b) horizontal
  - c) tilted
  - d) inclined at 45
- 4) The origin of cause of biomass energy is \_\_\_\_\_.
  - a) photosynthesis
  - b) Fermentation
  - c) oxidation
  - d) reduction
- 5) Wind energy is manifestation of \_\_\_\_\_.
  - a) heat energy
  - b) mechanical energy
  - c) solar energy
  - d) none of these
- 6) A device, system or process is working at \_\_\_\_\_ efficiency when maximum work is done for a given magnitude of energy input.
  - a) minimum
  - b) maximum
  - c) zero
  - d) none of these

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

- a) Differentiate between primary and secondary energy sources with one example each.
- b) State principles of energy conservation policies.
- c) Draw the I-V characteristics of solar cell.
- d) What is biomass and biomass energy?
- e) Define fill factor of solar cell.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain photosynthesis for origin of biomass energy and give important characteristics of Biomass
  - b) State any three advantages and disadvantages wind energy.
  - c) Explain renewable and non-renewable source of energy with examples.
- Q.4 Answer the following questions. (Any Two) 06**
- a) State any three advantages and disadvantages Biomass Energy.
  - b) Explain benefits of Energy Conservation.
  - c) Explain in detail classification of energy.
- Q.5 Answer the following question. (Any One) 06**
- a) Discuss the different application of solar energy and state their advantages and disadvantages.
  - b) What is wind energy? Explain the construction of three blade horizontal axis wind turbine.

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Chemistry  
Environmental Chemistry (G04-GE-OE-102)**

Day & Date: Thursday, 06-11-2025  
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 Multiple choice questions.****06**

- 1) Particulate matter are minute particles that remain suspended in the air and cause irritation when inhaled \_\_\_\_ of the following is an example of particulate matter.
  - a) Nitrogen Dioxide
  - b) Water Vapor
  - c) Ozone
  - d) Fly ash
- 2) \_\_\_\_ is the amount of oxygen required to oxidize only organic matter in sewage.
  - a) Turbidity
  - b) BOD
  - c) COD
  - d) DO
- 3) \_\_\_\_ pollution causes hearing loss in organisms.
  - a) Air
  - b) Water
  - c) Soil
  - d) Sound
- 4) \_\_\_\_ of the following techniques is used for reducing the total dissolved solids (TDS) in the water.
  - a) Osmosis
  - b) Ion exchange
  - c) Distillation
  - d) Both b and c
- 5) \_\_\_\_ of the following is a waterborne disease.
  - a) Typhoid
  - b) Cholera
  - c) Diarrhea
  - d) All of the above
- 6) In which temperature soil develops slowly?
  - a) Summer
  - b) wind
  - c) Rainy
  - d) cold

- Q.2 Answer the following questions. (Any Three) 06**
- a) Define threshold limit value and dissolved oxygen.
  - b) What is soil profile?
  - c) Give the types of water pollutants.
  - d) Give two examples of resources of water.
  - e) Give the methods for industrial water treatment.
- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain the classification of air pollutants.
  - b) Give the effect of sound pollution on human health.
  - c) Explain the physical methods involved for treatment of water.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain the municipal sewage and give the names of method involved treatment process.
  - b) What is Automobile pollution and nuclear pollution?
  - c) Explain the chemical methods involved for treatment of water.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain in detail treatment of potable water.
  - b) Explain in detail sound pollution with respect to sources, effects and control.

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Botany  
Horticulture (G04-GE-OE-103)**

Day & Date: Thursday, 06-11-2025  
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 and rewrite the complete sentence. 06**

- 1) Branch of horticulture deals with cultivation of fruit known as \_\_\_\_\_.  
a) agriculture    b) pomoculture  
c) floriculture     d) olericulture
- 2) Weeding of garden is done by \_\_\_\_\_.  
a) khurupi    b) secateur  
c) knife    d) water can
- 3) Layering can be done on the plant such as \_\_\_\_\_.  
a) bulb     b) lime  
c) sugarcane    d) oleander
- 4) A common example of stem tuber is \_\_\_\_\_.  
a) Ginger     b) Garlic  
c) Onion    d) Potato
- 5) Artificial methods of reproduction do not include \_\_\_\_\_.  
a) cutting     b) layering  
c) budding    d) rhizome
- 6) The process of moving of plants from its pot to larger pot with drainage hole is called \_\_\_\_\_.  
a) Pomoculture     b) olericulture  
c) Repotting    d) potting

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

- a) What is mean by floriculture?
- b) Write the use of budding knife.
- c) Draw neat, labelled diagram of sucker.
- d) Define annual plant.
- e) What is mean by budding?

- Q.3 Answer the following questions. (Any Two) 06**
- a) Write the scope of horticulture.
  - b) Write a note on simple layering.
  - c) Explain in brief runner.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Write a note on stem cutting.
  - b) Explain in brief scope of plant propagation.
  - c) Write a note on sexual method of propagation in biannual plant.
- Q.5 Answer the following question. (Any One) 06**
- a) With neat, labelled diagram, Describe the method of potting.
  - b) Write a note on patch budding.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Zoology  
Aquarium Fish Keeping and Maintenance (G04-GE-OE-104)**

Day & Date: Thursday, 06-11-2025  
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) The glass-plates of a home aquarium is sealed by \_\_\_\_\_.
  - a) Agar Glue
  - b) Polysulfide sealant
  - c) Silicon Rubber Sealant
  - d) Flour Glue
  
- 2) During the breeding season, which character is most reliable for determine the sex in angel fish \_\_\_\_\_.
  - a) Body colour
  - b) Papilla(breeding tube)
  - c) Length of fin
  - d) Nuchal hump
  
- 3) Live food consist of \_\_\_\_\_.
  - a) Live worms
  - b) Small fishes
  - c) Water flies
  - d) All of the above
  
- 4) 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
  
- 5) Which of the following protozoan disease is known as White spot disease.
  - a) Chilodonellosis
  - b) Ichthyophthiriasis
  - c) Hexamitiasis
  - d) Trichodiniasis
  
- 6) \_\_\_\_\_ is endemic fish.
  - a) Guppy
  - b) Gold fish
  - c) zebra fish
  - d) Molly

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

- a) Significance of dry fish food.
- b) What is live bearer.
- c) Morphology of butterfly fish.
- d) Give any two Aquarium fish diseases.
- e) Give common characters of Butterfly fish.

- Q.3 Answer the following questions. (Any Two) 06**
- a) What is exotic species. Give scientific names of two exotic aquarium fishes.
  - b) Write a short note on the budget for setting Aquarium fish farm as cottage industry.
  - c) Write a short note on different kinds of feed for aquarium fishes.
- Q.4 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.5 Answer the following question. (Any One) 06**
- a) Elucidate briefly the potential scope of aquarium fish keeping industry as a cottage industry.
  - b) Give an account of general maintenance of aquarium.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November - 2025  
MATHEMATICS  
Quantitative Aptitudes for Competitive Examinations  
(G04-GE-OE-110)**

Day & Date: Thursday, 06-11-2025  
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 for each of the following.****06**

- 1) The place value of 8 in 70984 is \_\_\_\_\_.  
a) 80  
b) 8  
c) 984  
d) 84
- 2)  $1888 \div 32 \div 8 =$  \_\_\_\_\_.  
a) 9.485  
b) 7.375  
c) 29.5  
d) 472
- 3)  $\frac{\sqrt{196}}{7} \times \frac{\sqrt{441}}{7} \times \frac{120}{\sqrt{225}} =$  \_\_\_\_\_.  
a) 54  
b) 58  
c) 84  
d) 48
- 4) The cost Rs.7200, 8% stock at 90 is \_\_\_\_\_.  
a) 6482  
b) 6480  
c) 480  
d) 6580
- 5)  $(27)^{2/3} =$  \_\_\_\_\_.  
a) 7  
b) 8  
c) 9  
d) 10
- 6) The average of the following set of scores 385, 441, 876, 221, 536, 46, 291, 428 is = \_\_\_\_\_.  
a) 403  
b) 402  
c) 401  
d) 400

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

- a) Find the L.C.M. of 72, 108 and 2100.  
b) The number 5967013 is divisible by 3?  
c) A gold bracelet is sold for Rs.14500 at a loss of 20%. What is the cost price of the gold bracelet?

- d) Find the average of first 20 multiple of 7.  
 e) If  $7 : x = 17.5 : 22.5$ , then find the value of  $x$ .

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

- a) If the sum of two numbers is 10 and the sum of their reciprocals is  $\frac{5}{12}$  find the numbers.  
 b) After 3 years, how much compound interest will be obtained on Rs. 7800 at the interest rate of 5% per annum?  
 c) A sum at simple interest at  $13\frac{1}{2}\%$  per annum amounts to Rs. 2502.50 after 4 years. Find the sum.

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

- a) Evaluate  
 i)  $0.5 \times 5.6 \div 0.5 \times 12$   
 ii)  $25 \times 3.25 + 50.4 \div 24$   
 iii)  $0.01 \times 0.1 - 0.001 \div 10 + 0.01$   
 b) Find the value of  $\left[5 \left(8^{\frac{1}{3}} + 27^{\frac{1}{3}}\right)^3\right]^{\frac{1}{4}}$   
 c) Find three numbers in the ratio of 3 : 2 : 5 such that the sum of their squares is equal to 1862.

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

- a) The product of the ages of Ankita and Nikita is 240. If twice the age of Nikita is more than Ankita's age by 4 years, then find Nikita's age.  
 b) Find the income derived from 88 shares of Rs.25 each at 5 premium, brokerage being  $\frac{1}{4}$  per share and the rate of dividend being  $7\frac{1}{2}\%$  per annum. Also, find the rate of interest on the investment.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November - 2025  
STATISTICS  
Fundamentals of Statistics (G04-GE-OE-111)**

Day & Date: Thursday, 06-11-2025  
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) The number of children in each family is an example of \_\_\_\_\_.
  - a) Time series
  - b) An individual series
  - c) A discrete series
  - d) A continuous series
- 2) With the help of ogive curve, one cannot determine \_\_\_\_\_.
  - a) median
  - b) deciles
  - c) percentiles
  - d) mode
- 3) If each of the observation in a series is divided by 5 then the mean of new data set is \_\_\_\_\_.
  - a) Unaffected
  - b) Half of the old mean
  - c) Decreased by 5
  - d) The old mean is five times the new mean
- 4) Which of the following relation between standard deviation (S. D.) and variance (Var(X)) of a variable X is true?
  - a)  $S.D. = \text{Var}(X)$
  - b)  $(S.D.)^2 = \text{Var}(X)$
  - c)  $S.D. = [\text{Var}(X)]^2$
  - d) None of the above
- 5) If the mean and S.D. are 2 and 4 respectively then the second moment about origin is \_\_\_\_\_.
  - a) 24
  - b) 20
  - c) 22
  - d) None of the above
- 6) The limits of Karl Pearson's coefficient of correlation (r) is \_\_\_\_\_.
  - a) 0 to 1
  - b) 0 to  $\infty$
  - c) -1 to 1
  - d) None of the above

- Q.2 Answer the following questions. (Any Three) 06**
- a) Explain primary data.
  - b) Define of Karl Pearson's coefficient of correlation ( $r$ ) and state the limits of  $r$ .
  - c) State merits and demerits of harmonic mean.
  - d) Prove that  $\text{Corr}(X, X) = 1$
  - e) Define range and coefficient of range.
- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain: qualitative and quantitative data.
  - b) Explain the construction of pie diagram.
  - c) Define median, give merits and demerits of mode.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Show that sum of deviations taken from mean is zero.
  - b) Prove that correlation coefficient lies between  $-1$  to  $+1$ .
  - c) Write short note on regression coefficients.
- Q.5 Answer the following question. (Any One) 06**
- a) Define variance. State and prove effect of change of origin and scale on variance.
  - b) For any two positive observations, prove that  $A. M. \geq G. M. \geq H. M.$

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November - 2025  
Computer Science  
Office management Tools (G04-GE-OE-108)**

Day & Date: Thursday, 06-11-2025  
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) Which of the following is an example of page orientation?
  - a) Landscape
  - b) Subscript
  - c) Superscript
  - d) A4
- 2) \_\_\_\_\_ is shortcut key for paste.
  - a) ctrl + v
  - b) ctrl + x
  - c) ctrl + c
  - d) ctrl + s
- 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) The default extension of MS-Word file is \_\_\_\_\_.
  - a) .txt
  - b) .docx
  - c) .xlsx
  - d) None of the above
- 5) Microsoft Power Point is a \_\_\_\_\_ program.
  - a) Graphics
  - b) Painting
  - c) Data Analysis
  - d) Presentation
- 6) The bar at the Top of a window on that display name of applications is known as?
  - a) menu bar
  - b) status bar
  - c) title bar
  - d) task bar

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

- a) What is workbook?
- b) What is the CONCATENATE function used for?
- c) What is power point?
- d) How to add header and footer in MS-word document.
- e) What is template?

- Q.3 Answer the following questions. (Any Two) 06**
- a) What are the different data formats in Excel?
  - b) Explain its key features of MS-Word.
  - c) Explain the operations related to workbook.
- Q.4 Answer the following questions. (Any Two) 06**
- a) How to add image and table in MS-word document.
  - b) Explain different types of function in MS-Excel.
  - c) Write the different applications of Power Point.
- Q.5 Answer the following question. (Any One) 06**
- a) What are the basic components of Excel?
  - b) What is Mail-merge? Explain its steps in details.

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Electronics  
Basic Electronic Consumer Applications (G04-GE-OE-105)**

Day & Date: Thursday, 06-11-2025  
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.
  - 4) Use of log table and calculator is allowed

**Q.1 Select the correct alternatives from the following. 06**

- 1) In mobile charger \_\_\_\_\_ is used to convert ac into dc
  - a) Inverter
  - b) regulator
  - c) Rectifier
  - d) switch
- 2) Base of power transistor is \_\_\_\_\_.
  - a) Thin
  - b) light
  - c) Medium
  - d) thick
- 3) \_\_\_\_\_ is IR receiver.
  - a) LED
  - b) photo diode
  - c) Zener diode
  - d) all of these
- 4) Temperature coefficient of RTD is \_\_\_\_\_.
  - a) Positive
  - b) negative
  - c) Zero
  - d) independent of temperature
- 5) Terminal no 3 of IC 555 is \_\_\_\_\_.
  - a) Control
  - b) output
  - c) Trigger
  - d) reset
- 6) Output of PIR sensor remains \_\_\_\_\_ when it detects the moving object
  - a) High
  - b) as it is
  - c) Low
  - d) high or low

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

- a) What are the main components of mobile charger circuit?
- b) Draw the symbols of solar cell, LED, RTD and LDR
- c) What is solenoid and what are its types?
- d) Draw the pin diagram of IC 555.
- e) What is roll of RTD in automatic water heater?

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain construction features of LDR.
  - b) Explain basic features of LM 35.
  - c) Explain PIR sensor with diagram.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain working of solenoid.
  - b) Explain solar cell and formation of solar panel with neat diagram.
  - c) Explain turning on and off of LED bulb with help of TV remote.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain with neat block diagram internal structure of IC 555.
  - b) Explain with neat circuit diagram use of power transistor and relay to turn on and turn off Tube.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Microbiology  
Human Health and Hygiene (G04-GE-OE-106)**

Day & Date: Thursday, 06-11-2025  
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) \_\_\_\_\_ is the best poor hygiene indicator organism.
  - a) *Azotobacter*
  - b) *Bacillus subtilis*
  - c) *E.Coli*
  - d) *Lactobacillus*
- 2) \_\_\_\_\_ is the healthcare agency.
  - a) Hospital
  - b) Cinema hall
  - c) corporate building
  - d) College
- 3) Poor sanitation leads to \_\_\_\_\_.
  - a) Improved health
  - b) Disease
  - c) Good smell
  - d) Improved social status
- 4) Clean air, stable climate, adequate water, safe use of chemicals can improve \_\_\_\_\_.
  - a) Personal health
  - b) Public health
  - c) Environmental health
  - d) All of the above
- 5) The causative agent of Tuberculosis is \_\_\_\_\_.
  - a) Virus
  - b) Bacterium
  - c) Malnutrition
  - d) Protozoan
- 6) The main symptom of Tuberculosis is formation of \_\_\_\_\_.
  - a) Liquid
  - b) Scar
  - c) Lump
  - d) Tubercle

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

- a) Define Health.
- b) What is containment?
- c) Normal flora of human body.
- d) What is causative agent of tuberculosis?
- e) Which disease is transmitted through physical contact?

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain how personal hygiene should be maintained?
  - b) Preventive measures of influenza.
  - c) Give a brief explanation of Good Hygienic practices.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Give the importance of health education.
  - b) What is national health mission?
  - c) Role of normal flora in human health
- Q.5 Answer the following question. (Any One) 06**
- a) Describe the preventive and control measures of Cholera and typhoid.
  - b) Explain vector borne diseases with examples.

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Geography  
Geography of Maharashtra - I (G04-GE-OE-107)**

Day & Date: Thursday, 06-11-2025  
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) East to west Length of Maharashtra is \_\_\_\_\_ Km.
  - a) 720
  - b) 600
  - c) 800
  - d) 700
- 2) According to Area Maharashtra holds \_\_\_\_\_ rank in India.
  - a) 3
  - b) 2
  - c) 4
  - d) 5
- 3) Konkan rivers originated from \_\_\_\_\_ mountain,
  - a) Satpura
  - b) Nilgiri
  - c) Sahyadri
  - d) None of the above
- 4) Hatnur dam built on \_\_\_\_\_ river.
  - a) Tapi
  - b) Godavari
  - c) Narmada
  - d) None of the above
- 5) \_\_\_\_\_ is West flowing rivers in Maharashtra.
  - a) Tapi
  - b) Godavari
  - c) Panjara
  - d) None of the above
- 6) Which region experience highest rainfall in Maharashtra \_\_\_\_\_.
  - a) Khandesh
  - b) Konkan
  - c) Vidharbha
  - d) Marathawada

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

- a) State the name of administrative division of Maharashtra
- b) Write the name of three Major River of India.
- c) What are the types of vegetation found in Maharashtra?
- d) Which type of climate found in Maharashtra, write two lines about it.
- e) Write three lines about Maharashtra summer season.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain the season of Maharashtra.
  - b) What is mean by forestation.
  - c) Write a type of soil erosion.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Write a note on Soil Conservation.
  - b) Explain Tropical Evergreen Forest in Maharashtra.
  - c) What is mean by forest protection?
- Q.5 Answer the following question. (Any One) 06**
- a) Give Brief information about water resources in Maharashtra. (Dams and rivers).
  - b) Write a need for water conservation in Maharashtra.

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

ऑक्टोबर / नोव्हेंबर – २०२५

**GEOLOGY**

**Natural Hazards and Disaster Management (G04-GE-OE-109)**

वार, दिनांक: गुरुवार, ०६-११-२०२५

कमाल गुण: ३०

वेळ: दुपारी १२:०० ते १:३०

सूचना : १) सर्व प्रश्न अनिवार्य आहेत.

२) उजवीकडील अंक पूर्ण गुण दर्शवितात.

प्र.१ रिकाम्या जागा भरा.

०६

- १) ——— ही एक प्रकारची नैसर्गिक आपत्ती नाही.
 

अ) हवामानशास्त्रीय	ब) जैविक
क) भूवैज्ञानिक	ड) औद्योगिक
- २) ——— ची व्याख्या पृथ्वीच्या कवचाचा अचानक थरथरणे अशी केली जाऊ शकते?
 

अ) भूकंप	ब) पूर
क) ज्वालामुखी	ड) चक्रीवादळ
- ३) त्सुनामीची कारणे ——— मुळे आहेत.
 

अ) भूकंप	ब) ज्वालामुखी
क) भूस्खलन	ड) हे सर्व
- ४) सर्वाधिक मुबलक वायू ज्वालामुखीपासून अवलंबून असतो ———.
 

अ) CO <sub>2</sub>	ब) पाण्याची वाफ
क) सल्फर	ड) यापैकी काहीही नाही
- ५) दूष्काळाची कारणे ——— मुळे आहेत.
 

अ) पावसाची तूट	ब) लोकसंख्येपेक्षा जास्त
क) जंगलतोड	ड) हे सर्व
- ६) ——— या शब्दामध्ये टेकडी उताराच्या सर्व वस्तुमान हालचालींचा समावेश होतो.
 

अ) पूर	ब) भूस्खलन
क) चक्रीवादळ	ड) यापैकी नाही

- प्र.२ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही तीन) 0६
- १) परिभाषित आपत्ती.
  - २) ज्वालामुखी म्हणजे काय?
  - ३) नैसर्गिक धोके म्हणजे काय?
  - ४) भूकंपाची कारणे स्पष्ट करा.
  - ५) आपत्तीच्या जोखमीबद्दल लिहा.
- प्र.३ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही दोन) 0६
- १) भूकंपाचे प्रमाण काय आहे?
  - २) दुष्काळाची व्याख्या करा? दुष्काळाचे प्रकार सांगा.
  - ३) पूर व्यवस्थापनाचे वर्णन करा.
- प्र.४ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही दोन) 0६
- १) आपत्ती व्यवस्थापन चक्राचे वर्णन करा.
  - २) भारतातील विविध चक्रीवादळ क्षेत्रांचे वर्णन करा.
  - ३) ज्वालामुखीतून बाहेर वर्णन करा.
- प्र.५ खालील उत्तर द्या. (कोणताही एक) 0६
- १) भूकंपाचा अंदाज, खबरदारी आणि नियंत्रण उपायांचे वर्णन करा.
  - २) दुष्काळातील जोखीम कमी करण्याच्या उपायांचे वर्णन करा.

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Set	P
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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November - 2025**

**GEOLOGY**

**Natural Hazards and Disaster Management (G04-GE-OE-109)**

Day & Date: Thursday, 06-11-2025  
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) \_\_\_\_\_ is not the type natural disaster.
 

a) Meteorological	b) Biological
c) Geological	d) Industrial
  
- 2) \_\_\_\_\_ can be defined as the sudden shaking of the earth crust.
 

a) earthquake	b) flood
c) volcano	d) cyclone
  
- 3) Causes of tsunami is due to \_\_\_\_\_.
 

a) Earthquake	b) Volcano
c) Landslide	d) All of these
  
- 4) Most abundant gas relies from volcano is \_\_\_\_\_.
 

a) CO <sub>2</sub>	b) Water vapour
c) Sulfur	d) None of these
  
- 5) Causes of drought is due to \_\_\_\_\_.
 

a) Deficit rainfall	b) over population
c) Deforestation	d) All of these
  
- 6) The term \_\_\_\_\_ includes all verities mass movement of hill slope.
 

a) Flood	b) Landslide
c) cyclone	d) none of these

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

- a) Defined disaster.
- b) What is Volcano?
- c) What is natural hazards?
- d) Explain causes of earthquake.
- e) Write about disaster risk.

- Q.3 Answer the following questions. (Any Two) 06**
- a) What is scale of earthquake?
  - b) Define drought? Describe types of drought.
  - c) Describe the flood management.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Describe disaster management cycle.
  - b) Describe different cyclone zones in India.
  - 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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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Environmental Science  
Earth and Earth Surface (G04-GE-OE-112)**

Day & Date: Thursday, 06-11-2025  
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) The atmosphere is primarily composed of which gas?
  - a) Oxygen
  - b) Nitrogen
  - c) Carbon dioxide
  - d) Argon
  
- 2) Which of the following mountain systems is part of the Peninsular Indian Mountain range?
  - a) Himalayas
  - b) Western Ghats
  - c) Andes
  - d) Alps
  
- 3) The Indo-Gangetic Plains were formed primarily due to: \_\_\_\_\_.
  - a) Volcanic activity
  - b) Glacial deposition
  - c) River sedimentation
  - d) Tectonic uplift
  
- 4) What is the primary factor driving glacier dynamics?
  - a) Wind patterns
  - b) Solar radiation
  - c) Gravitational force
  - d) Atmospheric pressure
  
- 5) Which interface is crucial for studying the interaction between the atmosphere and oceans?
  - a) Atmosphere-land interface
  - b) Ocean-land interface
  - c) Atmosphere-ocean interface
  - d) Land-river interface
  
- 6) The Himalayas were formed as a result of: \_\_\_\_\_.
  - a) Sea floor spreading
  - b) Collision of the Indian and Eurasian plates
  - c) Subduction of oceanic plates
  - d) Continental drift

- Q.2 Answer the following questions. (Any Three) 06**
- a) What is orogeny? Give an example?
  - b) Name any two rock-forming minerals?
  - c) What is continental drift theory?
  - d) What is the composition of Earth's atmosphere?
  - e) Explain the role of glaciers in shaping landforms?
- Q.3 Answer the following questions. (Any Two) 06**
- a) What are the Vindhyan and Aravalli ranges?
  - b) Explain geological time scale?
  - c) List any two differences between oceanic and continental crust?
- Q.4 Answer the following questions. (Any Two) 06**
- a) How are perennial river systems different from seasonal ones?
  - b) Mention two processes involved in river geomorphology?
  - c) Define the atmosphere-ocean interface with examples.
- Q.5 Answer the following question. (Any One) 06**
- a) Describe the process of sea floor spreading with examples?
  - b) Write an essay on the formation of Pangaea and its breakup into present-day continents?

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
English/ English for communication (ENG-101)**

Day & Date: Friday, 07-11-2025  
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 answers and rewrite the following. 06**

- 1) \_\_\_\_\_ is the characteristic of effective communication.
 

a) Clarity	b) Complexity
c) Ambiguity	d) noise
  
- 2) Non-verbal communication often happens \_\_\_\_\_.
 

a) Carefully	b) purposely
c) Intentionally	d) unintentionally
  
- 3) The process of converting the message into a form that can be transmitted is called \_\_\_\_\_.
 

a) Encoding	b) Decoding
c) Feedback	d) Receiving
  
- 4) \_\_\_\_\_ interviews are conducted at the end of the training programme.
 

a) Structured	b) summative
c) non-structured	d) non-summative
  
- 5) \_\_\_\_\_ is important in a group discussion.
 

a) Emotional stability	b) Hostility
c) Ignorance	d) Aggressiveness
  
- 6) In a group discussion, we must communicate with \_\_\_\_\_.
 

a) Hostility	b) ignorance
c) knowledge	d) complexity

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

- a) Comment on the 'Do's of an interview.
- b) What does mean by non-verbal communication?
- c) Define the concept of communication.
- d) What does mean by group discussion?

- Q.3 Write short answers to the questions. (Any one)** **06**
- a) Discuss the significance of the communication.
  - b) Comment on the 7Cs of communication
- Q.4 Answer the question. (Any one)** **12**
- a) Write a script of an interview for the post of receptionist in the office.
- OR**
- b) Write a script of a group discussion on Today's Education System.

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

**ऑक्टोबर/नोव्हेंबर – २०२५**

**Constitution of India/ Indian Constitution and Democracy (ICD)**

वार, दिनांक: शनिवार, ०८-११-२०२५

कमाल गुण: ३०

वेळ: दुपारी १२:०० ते १:३०

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

**प्र.१ रिकाम्या जागा भरा.**

**०६**

- १) भारतीय राज्यघटना कधी लागू झाली?  
अ) १५ ऑगस्ट १९४७                      ब) २६ जानेवारी १९५०  
क) २६ नोव्हेंबर १९४९                      ड) २ ऑक्टोबर १९५०
- २) 'धर्मनिरपेक्ष' हा शब्द प्रस्तावनेत कोणत्या दुरुस्तीने समाविष्ट केला गेला?  
अ) ४२ वी    ब) ४४ वी  
क) ५२ वी    ड) ७३ वी
- ३) भारतीय राज्यघटनेने किती मूलभूत अधिकार हमी दिले आहेत?  
अ) ५    ब) ६  
क) ७    ड) ८
- ४) भारताची निवडणूक आयोग ही कोणत्या प्रकारची संस्था आहे?  
अ) वैधानिक संस्था                              ब) खाजगी संस्था  
क) घटनात्मक संस्था                              ड) सरकारी विभाग
- ५) सुशासनाचा भर कोणत्या गोष्टीवर असतो?  
अ) कायद्याचे राज्य                              ब) पारदर्शकता  
क) जबाबदारी                                      ड) वरील सर्व
- ६) भारतात मतदानाबाबत जागरूकता कोणत्या मोहिमेद्वारे वाढवली जाते?  
अ) बेंटी बचाओ                                      ब) मतदार ओळखपत्र मोहीम  
क) SVEEP    ड) नीति आयोग

- प्र.२ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही तीन) 0६
- १) भारतीय राज्यघटनेची कोणतीही दोन वैशिष्ट्ये लिहा.
  - २) भारतीय नागरिकांचे कोणतेही दोन मूलभूत कर्तव्ये लिहा.
  - ३) लोकशाहीची संक्षिप्त व्याख्या द्या.
  - ४) भारताच्या निवडणूक आयोगाचे कोणतेही दोन अधिकार लिहा.
  - ५) SVEEP कार्यक्रमाचे उद्दिष्ट काय आहे?
- प्र.३ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही दोन) 0६
- १) प्रस्तावनेचे महत्त्व स्पष्ट करा.
  - २) लोकशाहीचे प्रकार वर्णन करा.
  - ३) भारताच्या निवडणूक आयोगाची रचना सांगा.
- प्र.४ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही दोन) 0६
- १) सुशासनाची वैशिष्ट्ये स्पष्ट करा.
  - २) मूलभूत अधिकारांवर लघुनिबंध लिहा.
  - ३) निवडणूक आयोगाच्या कार्याचे वर्णन करा.
- प्र.५ खालील उत्तर द्या. (कोणताही एक) 0६
- १) भारतीय नागरिकांच्या मूलभूत कर्तव्यांवर सविस्तर चर्चा करा.
  - २) भारतातील लोकशाहीची वैशिष्ट्ये व महत्त्व स्पष्ट करा.

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Constitution of India/ Indian Constitution and Democracy (ICD)**

Day & Date: Saturday, 08-11-2025  
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) The Constitution of India came into force on: \_\_\_\_\_.  
a) 15th August 1947                      b) 26th January 1950  
c) 26th November 1949                 d) 2nd October 1950
- 2) The term 'Secular' was added to the Preamble by which amendment?  
a) 42<sup>nd</sup>                                         b) 44<sup>th</sup>  
c) 52<sup>nd</sup>                                         d) 73<sup>rd</sup>
- 3) How many fundamental rights are guaranteed by the Indian Constitution?  
a) 5    b) 6  
c) 7    d) 8
- 4) The Election Commission of India is a/an: \_\_\_\_\_.  
a) Statutory body                          b) Private body  
c) Constitutional body                    d) Government department
- 5) Good Governance emphasizes: \_\_\_\_\_.  
a) Rule of law                                b) Transparency  
c) Accountability                          d) All of these
- 6) Voting awareness in India is promoted through which campaign?  
a) Beti Bachao                                b) Voter ID Drive  
c) SVEEP                                        d) NITI Aayog

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

- a) State any two features of the Indian Constitution.
- b) Mention two fundamental duties of an Indian citizen.
- c) Define democracy in brief.
- d) Write any two powers of the Election Commission of India.
- e) What is the objective of the SVEEP program?

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the importance of the Preamble.
  - b) Describe the types of democracy.
  - c) State the structure of the Election Commission of India.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain the features of good governance.
  - b) Write a short note on fundamental rights.
  - c) Describe the functions of the Election Commission.
- Q.5 Answer the following. (Any One) 06**
- a) Discuss in detail the fundamental duties of Indian citizens.
  - b) Explain the features and importance of democracy in India.

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Indian Knowledge System/ General IKS (IKS-101)**

Day & Date: Monday, 10-11-2025  
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) Chanakya was an alumni of \_\_\_\_\_ university
  - a) Takshshila
  - b) Vikramsinha
  - c) Nalanda
  - d) Vallabhi
- 2) Which philosophy emphasized non-violence (ahimsa) and self discipline for liberation?
  - a) Jainism
  - b) Buddhism
  - c) Yoga
  - d) Nyaya
- 3) What was the significant contribution of the Bodhayana Sutra in ancient Indian mathematics?
  - a) Development of geometry
  - b) Calculation of square roots
  - c) The concept of zero
  - d) Introduction of calculus
- 4) Which traditional Indian medical system emphasizes the balance of bodily elements doshas?
  - a) Unani
  - b) Ayurveda
  - c) Homeopathy
  - d) Naturopathy
- 5) What is one of the primary practices of sustainability in traditional Indian agriculture?
  - a) Monocropping
  - b) Crop rotation
  - c) Use of chemical pesticides
  - d) Large-scale mechanization
- 6) What was the role of sacred groves in ancient India?
  - a) To serve as places of worship and environmental conservation
  - b) To serve as agricultural fields
  - c) To serve as military based
  - d) To serve as market places

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

- a) What were the main subjects taught as Takṣaśsilā?
- b) Give any two Indian traditions in IKS?
- c) What is the first source of Indian knowledge tradition?

- d) Which metal alloy was developed in India, known for its exceptional quality?
- e) Where did Indus civilization originate?

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

- a) Explain the innovations in ancient India in chemistry?
- b) Discuss the significance of the concept of zero in Indian mathematics.
- c) Describe the traditional Indian approach to water conservation and management

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

- a) How does Ayurveda integrate the concept of balance in health with environmental sustainability
- b) Discuss the role of ancient Indian practices in sustainable agriculture
- c) Explain the role of guru-shishya tradition in the Indian Knowledge System

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

- a) Explain characteristic of Indian philosophical and IKS.
- b) Explain the concept of Sattvic food in Ayurveda and its importance for health.

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Set **P**

**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025**

**Physics - I**

**Mechanics and properties of Matter (G04-0101)**

Day &amp; Date: Tuesday, 11-11-2025

Max. Marks: 30

Time: 12:00 PM To 01:30 PM

- 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) 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
  
- 2) The theoretical limiting values of Poisson's ratio are \_\_\_\_\_.
 

a) -1 and +0.5	b) +1 and -0.5
c) -1 and -0.5	d) -1 and +1
  
- 3) If the substance is highly soluble in a liquid then the surface tension of liquid \_\_\_\_\_.
 

a) does not change	b) increases
c) decreases	d) either decreases or increases
  
- 4) Viscosity of liquids increases with \_\_\_\_\_ in pressure on the liquid.
 

a) Increases	b) decreases
c) no change	d) None of these
  
- 5) If T is the surface tension of soap solution then the excess pressure inside the bubble of radius r is \_\_\_\_\_.
 

a) $\frac{2T}{r}$	b) $\frac{4T}{r}$
c) $\frac{T}{4r}$	d) $\frac{T}{2r}$
  
- 6) The ratio of shearing stress to shearing strain is called \_\_\_\_\_.
 

a) Young's modulus	b) bulk modulus
c) modulus of rigidity	d) Poisson's ratio

- Q.2 Answer the questions in brief. (Any Three) 06**
- a) Define coefficient of viscosity. State its units & dimensions.
  - b) What are the elastic constants of a material?
  - c) Calculate M.I. of rectangular lamina about its breadth if mass of rectangular lamina is 168 gm and length of the lamina is 10 cm.
  - d) Draw schematic diagram of kater's pendulum
  - e) Calculate the difference of pressure between the two sides of the surface of a spherical drop of water of radius 0.5 mm. Surface tension of water is 0.075 N/m.
- Q.3 Answer the following. (Any Two) 06**
- a) Derive an expression for the period of torsional pendulum.
  - b) Explain streamline and turbulent flow.
  - c) Discuss the factors affecting on surface tension.
- Q.4 Answer the following. (Any Two) 06**
- a) Write a note on venturimeter.
  - b) Show that the motion of a compound pendulum is an angular S.H.M.
  - c) In Jaegers experiment the difference in the level of manometric liquid of density  $0.7 \text{ gm/cm}^3$  is found to be 9 cm. The capillary tube of internal radius 0.25 mm dips 3 cm inside a liquid of density  $0.1 \text{ gm/cm}^3$ . When the bubble just burst, calculate the surface tension of the liquid ( $g = 980 \text{ cm/s}^2$ ).
- Q.5 Answer the following. (Any One) 06**
- a) Derive an expression for moment of inertia of a circular disc about an axis passing through its center and perpendicular to its plane.
  - b) Derive the expression for Poisson's ratio of rubber tube.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Chemistry – I  
Physical and Inorganic Chemistry (G04-0102)**

Day & Date: Wednesday, 12-11-2025  
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 logarithmic table and calculator is allowed.

**Q.1 Select the most correct alternative from among those given below. 06**

- 1) Efficiency of a heat engine is generally \_\_\_\_\_.
  - a) greater than one
  - b) less than one
  - c) zero
  - d) Infinity
- 2) Reaction between potassium persulphate and potassium iodide follows \_\_\_\_\_ order kinetics.
  - a) zero
  - b) First
  - c) second
  - d) Third
- 3) Hybridization and Shape of  $BeCl_2$  molecule is \_\_\_\_\_ respectively.
  - a)  $sp^3d^2$  and octahedral
  - b)  $sp^2$  and planar trigonal
  - c)  $sp^3$  and tetrahedral
  - d)  $sp$  and linear
- 4) Out of phase combination of atomic orbitals gives \_\_\_\_\_ molecular orbitals.
  - a) antibonding
  - b) Bonding
  - c) non-bonding
  - d) all of these
- 5) The unit of van der Waal's constant 'a' is \_\_\_\_\_.
  - a)  $atm\ litre^2\ mole^{-2}$
  - b)  $atm\ litre^2$
  - c)  $atm\ mole^{-2}$
  - d)  $atm\ litre^{-2}\ mole^2$
- 6) The number of bonds in CO is \_\_\_\_\_.
  - a) 4
  - b) 3
  - c) 2
  - d) 1

- Q.2 Answer the following. (Any Three) 06**
- Give demerits of Heitler-London Theory.
  - State ideal gas equation.
  - Draw only MO diagram of  $H_2$  molecule.
  - Explain  $p_x - p_x$  overlap.
  - Define:
    - molecularity and
    - Order of a chemical reaction.
- Q.3 Answer the following. (Any Two) 06**
- Formation of  $PCl_5$  molecule on basis of hybridization.
  - Give the half life time expressions for first and second order chemical reactions. Put the comments on them.
  - Nonbonding molecular orbitals.
- Q.4 Answer the following (Any Two) 06**
- With the help of neat labeled diagram, discuss Andrew's isotherms for  $CO_2$  gas.
  - Derive the rate constant expression for first order reaction.
  - Draw only molecular orbital diagram for  $C_2$  molecule. Comment on its bond order, stability and magnetic character.
- Q.5 Answer the following (Any One) 06**
- The critical temperature and the critical pressure for a gas are 562 K and  $48.6 \times 1.013 \times 10^5 Nm^{-2}$  respectively. Find the Van der Waals constants a and b.  
(Given:  $R = 0.08205 \times 1.013 \times 10^5 dm^3 Pa K^{-1} mol^{-1}$ )
  - Give postulates of VSEPR Theory. Explain the shape of  $NH_3$  molecule on basis of VSEPR theory.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November - 2025  
MATHEMATICS (Paper - I)  
Algebra and Calculus (G04-0110)**

Day & Date: Thursday, 13-11-2025  
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) The Eigen values of  $A = \begin{bmatrix} 1 & 0 & 0 \\ -1 & 2 & 0 \\ 4 & 0 & 3 \end{bmatrix}$  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  $n^{\text{th}}$  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  $\Phi$ ,  $\text{curl} (\text{grad } \Phi) =$  \_\_\_\_
- 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  $\begin{bmatrix} 3 & 2 & -1 & 5 \\ 5 & 1 & 4 & -2 \\ 1 & -4 & 11 & -19 \end{bmatrix}$
- b) Simplify  $\frac{(\cos 4\theta + i \sin 4\theta)^5}{(\cos 5\theta - i \sin 5\theta)^4}$
- 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) Show that 7 is the Eigen value of  $\begin{bmatrix} 1 & 6 \\ 5 & 2 \end{bmatrix}$  and find the corresponding Eigen vector.
- b) Examine for consistency and solve if consistent equations  
 $x + y + z = 6, \quad 2x + y + 3z = 13, \quad 5x + 2y + z = 12$
- c) State and Prove Euler's theorem on homogenous function.

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

06

- a) Find all the Values of  $(-1)^{1/3}$ .
- b) If  $y = (ax + b)^m$  then find  $n^{\text{th}}$  derivative of  $y$ .
- c) Show that the vector  $\vec{F} = \frac{-yi+xj}{x^2+y^2}$  is irrotational.

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

06

- a) State and prove Cayley- Hamiltonian 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:  
October/November - 2025  
Microbiology  
Basics in Microbiology (G04-0106)**

Day & Date: Thursday, 13-11-2025  
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 performed the swan neck flask experiment?
  - a) Louis Pasteur
  - b) Francisco Reddi
  - c) John Needham
  - d) John Tyndall
- 2) Which Govt. institute in Pune is focused on Virus research in India?
  - a) Serum Institute of India
  - b) Agarkar Research Institute
  - c) National Institute of Virology
  - d) National Chemical Laboratory
- 3) Which of the following scientists first showed a mutually beneficial relationship between bacteria and leguminous plants?
  - a) Robert Hook.
  - b) Sergie Winogradsky.
  - c) William Winogradsky.
  - d) Wendell Meredith Stanley.
- 4) Bacterial Flagella helps in \_\_\_\_\_.
  - a) Reproduction.
  - b) Respiration.
  - c) Collecting food.
  - d) Locomotion.
- 5) What do you mean by protoplast?
  - a) Cell devoid of cell wall.
  - b) A Locomotory organ.
  - c) Capsule.
  - d) None of the above.
- 6) The cell wall of Gram-positive bacteria is composed of \_\_\_\_\_.
  - a) More peptidoglycan and less lipopolysaccharide.
  - b) Only lipopolysaccharide.
  - c) Both Peptidoglycan and Lipopolysaccharide in equal amount.
  - d) Purely protein.

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

- a) Define Virus. name any two animal viruses.
- b) What is the Full form NCCS and NRCP?
- c) Enlist the basic shapes of bacteria used for classification.
- d) Write the two functions of the capsule.
- e) Define Space Microbiology.

- Q.3 Answer the following. (Any Two) 06**
- a) Enlist the various contributions of Louis Pasteur in Microbiology.
  - b) Explain basic principles of Nomenclature.
  - c) Write a short note on Bacterial Cell Wall.
- Q.4 Answer the following (Any Two) 06**
- a) Write a note on Medical Microbiology.
  - b) Enlist the general characteristics of Virus.
  - c) Write a short note on Bacterial Flagella.
- Q.5 Answer the following (Any One) 06**
- a) Give cultural and morphological characteristics required for bacterial classification and identification.
  - b) Write in detail the contributions of various scientists to the Germ theory of diseases.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November - 2025  
Statistics – I  
Descriptive Statistics (G04-0111)**

Day & Date: Friday, 14-11-2025  
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) The classes in which the lower limits or the upper limits are not specified is known as \_\_\_\_\_.
  - a) Open classes
  - b) Close classes
  - c) An open-end class
  - d) None of these
  
- 2) If the algebraic sum of the deviations of 10 observations measured from 15 is 7, then mean is \_\_\_\_\_.
  - a) 105
  - b) 70
  - c) 15.7
  - d) 16
  
- 3) The number of partition values in case of quartiles are \_\_\_\_\_.
  - a) 4
  - b) 3
  - c) 2
  - d) 1
  
- 4) The range of the scores 29,3,143,27,99 is \_\_\_\_\_.
  - a) 140
  - b) 143
  - c) 146
  - d) 70
  
- 5) For a distribution, C. V. and variance are 80% and 256 respectively, then the mean of the distribution is \_\_\_\_\_.
  - a) 1.6
  - b) 2.56
  - c) 16
  - d) 20
  
- 6) If  $\beta_2 > 3$ , then the frequency curve is \_\_\_\_\_.
  - a) Leptokurtic
  - b) Platykurtic
  - c) Mesokurtic
  - d) All the above

- Q.2 Answer the following. (Any Three) 06**
- a) Define Frequency and Cumulative frequency.
  - b) Define A.M. and G. M.
  - c) Define Mean Deviation and Mean Square Deviation.
  - d) Define Raw moments and Central Moments.
  - e) The lower and upper quartiles of a distribution are 80 and 120 respectively, while median is 100. Find Bowley's coefficient of skewness.
- Q.3 Answer the following. (Any Two) 06**
- a) Explain the construction of ogive curve.
  - b) If the median of the distribution 10,12,13,16,  $x$ , 20,25,30 is 18, Find the value of  $x$ . Hence find mean.
  - c) Write a note on Sheppard's correction.
- Q.4 Answer the following (Any Two) 06**
- a) Prove for any discrete frequency distribution standard deviation is not less than mean deviation from mean.
  - b) What is the effect of change of origin and scale on standard deviation?
  - c) Find mean and S.D. of 1,2,3,4,5,6.
- Q.5 Answer the following (Any One) 06**
- a) Derive the formula for mode in case of grouped frequency distribution.
  - b) State and prove minimal property of mean square deviation.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Botany – I  
Algae, Fungi and Archegoniate (G04-0103)**

Day & Date: Friday, 14-11-2025  
Time: 09:00 AM To 10:30 AM

Max. Marks: 30

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

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

- 1) \_\_\_\_\_ type of ovule present in gymnosperms.
  - a) Orthotropous
  - b) Anatropous
  - c) Campylotropous
  - d) Hemianatropous
- 2) \_\_\_\_\_ type of stele is present in *Selaginella* stem
  - a) Plectostele
  - b) Atactostele
  - c) Protostele
  - d) Siphonostele
- 3) Class plectomycetes is included in subdivision \_\_\_\_\_.
  - a) Basidiomycotina
  - b) Deteuromycotina
  - c) Ascomycotina
  - d) Myxomycota
- 4) \_\_\_\_\_ Which of the following pigments is present in the brown algae?
  - a) Phycoerythrin
  - b) Phycocyanin
  - c) Laminarin
  - d) Fucoxanthin
- 5) The archegonium of *Riccia* contains \_\_\_\_\_ neck canal cells
  - a) Two
  - b) Three
  - c) Four
  - d) Six
- 6) In pteridophytes sexual reproduction is \_\_\_\_\_.
  - a) Isogamous type
  - b) Anisogamous type
  - c) Nanogamous type
  - d) Oogamous type

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

- a) What is alternation of generation?
- b) Give occurrence of *Riccia*.
- c) What is eusporangiate development of sporangium?
- d) Give classification of *Sargassum*
- e) Enlist of the classes of gymnosperms in Sporne classification.

- Q.3 Answer the following. (Any Two) 06**
- a) Describe the general characters of Bryophytes.
  - b) Describe the thallus organization of *Spirogyra*.
  - c) Describe the general characters of class Zygomycotina.
- Q.4 Answer the following (Any Two) 06**
- a) Draw a labelled diagram of *Cycas* leaflet
  - b) Describe the Scalariform conjugation in *Spirogyra*
  - c) Describe the L.S. of *Sellaginella* strobilus
- Q.5 Answer the following (Any One) 06**
- a) Explain the economic importance of fungi.
  - b) Describe the general characters of Archigoniates

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Zoology – I  
Animal Diversity - I Non-chordates (G04-0104)**

Day & Date: Saturday, 15-11-2025  
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

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

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

**06**

- 1) Platyhelminthes are also known as \_\_\_\_\_.  
a) Roundworms                      b) Flatworms  
c) Earthworms                      d) Snail
- 2) Water vascular system is a characteristic feature of \_\_\_\_\_.  
a) Mollusca                      b) Annelida  
c) Arthropoda                      d) Echinodermata
- 3) Octopus belongs to the class \_\_\_\_\_.  
a) Mollusca                      b) Pelecypoda  
c) Cephalopoda                      d) Insecta
- 4) Tube feet are found in \_\_\_\_\_.  
a) Starfish                      b) Cuttlefish  
c) Crayfish                      d) Jellyfish
- 5) Segmented body is presented in \_\_\_\_\_.  
a) Annelids                      b) Porifera  
c) Mollusca                      d) Coelenterate
- 6) Periplaneta belongs to phylum \_\_\_\_\_.  
a) Mollusca                      b) Arthropoda  
c) Annelida                      d) Echinodermata

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

**06**

- a) Give importance of molluscs.
- b) Give classes of phylum Annelida.
- c) Write parasitic adaptations in *Ascaris*.
- d) Give classes of phylum Platyhelminthes.
- e) Give General characters of Kingdom Protista.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain in detail locomotion in protozoa.
  - b) Write a note on nutrition in *paramecium*.
  - c) Give economic importance of leech.
- Q.4 Answer the following (Any Two) 06**
- a) Explain in detail canal system in *Sycon*.
  - b) Describe General characters of phylum Cnidaria.
  - c) Explain economic importance of insects.
- Q.5 Answer the following (Any One) 06**
- a) Give life history of *Taenia solium*.
  - b) Describe Water-vascular system in Asterozoa.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November - 2025  
Environmental Science - II  
Introduction to the Environment (G04-0112)**

Day & Date: Saturday, 15-11-2025  
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. (MCQ)****06**

- 1) Which Planet is nearest to the sun in solar system?
  - a) Mercury
  - b) Saturn
  - c) Earth
  - d) Jupiter
  
- 2) In the transition to a metamorphic state, what happens?
  - a) Rocks change physically
  - b) Rocks change chemically
  - c) It is exposed to high temperatures and pressures
  - d) All the above options
  
- 3) The \_\_\_\_ rocks are formed by the deposition and subsequent cementation of that material within bodies of water and at the surface of the earth.
  - a) sedimentary
  - b) metamorphic
  - c) Igneous
  - d) all of the above
  
- 4) The \_\_\_\_ is the upper layer of the topsoil which is mainly composed of organic materials.
  - a) O-horizon
  - b) A-Horizon
  - c) E-Horizon
  - d) B-Horizon
  
- 5) \_\_\_\_ represents the "entirely recent" epoch.
  - a) Holocene Epoch
  - b) Pleistocene Epoch
  - c) Eocene Epoch
  - d) Oligocene Epoch
  
- 6) The \_\_\_\_ is the sum of all water on Earth.
  - a) hydrosphere
  - b) lithosphere
  - c) atmosphere
  - d) biosphere

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

- a) Write a note on Exosphere.
- b) Define Igneous Rock.
- c) Explain Biotic components.
- d) What is meant by Environment?
- e) Write note on Deforestation.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain in short the importance of Soil.
  - b) Write note on geological time scale.
  - c) Explain importance of environment.
- Q.4 Answer the following (Any Two) 06**
- a) Write note on inner planet of the solar system.
  - b) Explain O- horizon of soil layer.
  - c) Write note on physical weathering.
- Q.5 Answer the following (Any One) 06**
- a) Explain in brief soil profile with diagram.
  - b) Write a detailed note on internal structure of earth

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Geology – I  
General and Physical Geology (G04-0109)**

Day & Date: Monday, 17-11-2025  
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. (MCQ)**

**06**

- 1) \_\_\_\_\_ is not agents of weathering.
  - a) water
  - b) time
  - c) altitude
  - d) none of these
- 2) \_\_\_\_\_ discontinuity separate core from mantle.
  - a) Movorovisc
  - b) Conrad
  - c) Moho
  - d) Gutenberg
- 3) Earthquake wave is also called as \_\_\_\_\_ wave.
  - a) Seismic
  - b) Sound
  - c) Light
  - d) None of these
- 4) Second most abundant gas relies from volcano is \_\_\_\_\_.
  - a) CO<sub>2</sub>
  - b) Water vapour
  - c) Sulfer
  - d) None of these
- 5) The least density layer in earth interior is \_\_\_\_\_.
  - a) Crust
  - b) Mantle
  - c) Inner core
  - d) Outer layer
- 6) Average radius of the earth is \_\_\_\_\_ km.
  - a) 5.5
  - b) 6355
  - c) 6371
  - d) 6537

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

**06**

- a) What is sial and sima?
- b) What is Volcanic eruption?
- c) What is isoseismal lines?
- d) What is weathering?
- e) Write about rotation of earth

- Q.3 Answer the following. (Any Two) 06**
- a) Describe P and S waves in earthquake?
  - b) What are minor planets in solar system.
  - c) Describe different branches of geology.
- Q.4 Answer the following (Any Two) 06**
- a) Describe causes of earthquake.
  - b) Describe formation of soil.
  - c) Describe the atmosphere.
- Q.5 Answer the following (Any One) 06**
- a) Describe the internal structure of earth.
  - b) Describe physical or mechanical weathering.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Computer Science - I  
Programming Using C (G04-0108)**

Day & Date: Monday, 17-11-2025  
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 Multiple choice questions.****06**

- 1) \_\_\_\_\_ is the exit controlled loop.
  - a) for
  - b) while
  - c) do-while
  - d) both a & b.
- 2) printf() function belongs to \_\_\_\_\_ header file.
  - a) stdio.h
  - b) string.h
  - c) conio.h
  - d) math.h
- 3) Which of the following is not Keyword in C language?
  - a) struct
  - b) If
  - c) for
  - d) none of these.
- 4) \_\_\_\_\_ escape sequence character causes to transfer control to next line.
  - a) \t
  - b) \a
  - c) \n
  - d) \b
- 5) Which of the following is not characteristic of 'C' language?
  - a) Portability
  - b) Extend ability
  - c) Procedure Oriented
  - d) None of these.
- 6) \_\_\_\_\_ is symbolic representation of program logic.
  - a) Algorithm
  - b) Flowchart
  - c) Pseudo code
  - d) None of these.

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

- a) What is String?
- b) Define Tokens.
- c) Define local & global variables.
- d) What is table of string?
- e) How to declare pointer.

- Q.3 Answer the following. (Any Two) 06**
- a) Command line argument.
  - b) Nested structure.
  - c) Storage classes.
- Q.4 Answer the following (Any Two) 06**
- a) Explain the features of 'C'.
  - b) What is structure? How to pass structure to function explain it.
  - c) Explain call by value and call by reference with example.
- Q.5 Answer the following (Any One) 06**
- a) Write a program for addition of matrices.
  - b) What is file? How to open and close the file explain with program.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Geography – I  
Geomorphology - I (G04-0107)**

Day & Date: Tuesday, 18-11-2025  
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

- Instructions:** 1) All questions are compulsory.  
2) Draw neat diagrams wherever necessary.  
3) Use of Stencils is allowed.

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

- 1) \_\_\_\_ means the study of physical pattern, structure and process of earth surface.
 

a) Climatology	b) Oceanography
c) Pedology	d) Geomorphology
  
- 2) The word Geography was first used by \_\_\_\_\_.
 

a) Eratosthenes	b) Ratzel
c) Humbolt	d) Hakel
  
- 3) \_\_\_\_ waves pass through liquid and solid medium.
 

a) Secondary	b) Primary
c) Surface	d) None of these
  
- 4) \_\_\_\_ is the discontinuity between the Sial and Sima layer.
 

a) Moho	b) Canrad
c) Repetti	d) None of these
  
- 5) Vibration of the surface of the earth crust is known as \_\_\_\_\_.
 

a) Tsunami	b) Landslide
c) Earthquake	d) None of these
  
- 6) In \_\_\_\_ volcanoes constantly eject volcanic lava.
 

a) Dormant	b) Active
c) Dead	d) None of these

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

- a) What is an Endogenetic force?
- b) What is Volcano?
- c) What is a Surface wave?
- d) What is folding?
- e) What is Normal Fault?

- Q.3 Answer the following. (Any Two) 06**
- a) State the importance of Geomorphology.
  - b) Explain the Earthquake waves.
  - c) Explain the causes of plate motion.
- Q.4 Answer the following (Any Two) 06**
- a) In brief explain the causes of Volcano.
  - b) Explain the scope of Geomorphology.
  - c) Explain the Interior of Earth.
- Q.5 Answer the following (Any One) 06**
- a) Explain the Nature of Geomorphology.
  - b) Explain the destructive effects of Earthquake.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Electronics – I  
Digital Fundamentals (G04-0105)**

Day & Date: Wednesday, 19-11-2025  
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 radix of the octal number system is \_\_\_\_\_.
  - a) 10
  - b) 8
  - c) 2
  - d) 7
- 2) The full form of ASCII code is \_\_\_\_\_.
  - a) American Standard Code for Internet Interchange
  - b) American Standard Code for Internet Interconnect
  - c) American Standard Code for Information Interconnect
  - d) American Standard Code for Information Interchange
- 3) \_\_\_\_\_ is used as controlled inverter.
  - a) OR gate
  - b) AND gate
  - c) XOR gate
  - d) NOT gate
- 4) The Excess-3 Code of binary 0110 is \_\_\_\_\_.
  - a) 1001
  - b) 0110
  - c) 0101
  - d) 1100
- 5) In a sign binary number representation minus sign is indicated by \_\_\_\_\_.
  - a) 0
  - b) 1
  - c) LSB
  - d) parity
- 6) \_\_\_\_\_ IC is also is used as a universal gate.
  - a) 7404
  - b) 7408
  - c) 7432
  - d) 7400

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

**06**

- a) Define base of number system. State base of decimal and hexadecimal number system.
- b) Draw the symbol of three inputs OR gate & state its truth table.
- c) Draw a pin diagram of IC 7486.
- d) State the any two Boolean algebra rules or law.
- e) Give applications of XOR gate.

- Q.3 Answer the following. (Any Two) 06**
- a) Convert  $(101010)_2$  into Decimal and Octal number.
  - b) Draw the logic diagram of XOR gate with its symbol and truth table.
  - c) Show that  $(A + B)(A + C) = A + BC$ .
- Q.4 Answer the following (Any Two) 06**
- a) Perform Binary subtraction of:
    - 1)  $(1111)_2 - (0111)_2$
    - 2)  $(1010)_2 - (0110)_2$
  - b) State the De Morgan's theorems with their logic equations.
  - c) Explain in Brief half adder.
- Q.5 Answer the following (Any One) 06**
- a) With logic diagram explain the working, of Half and Full subtractor
  - b) What do you mean by codes? State their types. Explain Excess-3 code with examples.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November – 2025  
Physics  
Solar Energy and Solar Technology (G04-GE-OE-201)**

Day & Date: Thursday, 06-11-2025  
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 a non-renewable energy.
 

a) Solar energy	b) Wind energy
c) Coal energy	d) Tidal energy
  
- 2) The unit of kinetic energy is \_\_\_\_\_.
 

a) Watt	b) Joule
c) Newton	d) Pascal
  
- 3) The average solar constant ( $I_{sc}$ ) is \_\_\_\_\_.
 

a) 1367 W/m <sup>2</sup>	b) 1450 W/m <sup>2</sup>
c) 1200 W/m <sup>2</sup>	d) 1000 W/m <sup>2</sup>
  
- 4) \_\_\_\_\_ is the main component of the Sun.
 

a) Oxygen	b) Helium
c) Hydrogen	d) Carbon
  
- 5) The term photovoltaic means \_\_\_\_\_.
 

a) electricity generated by wind	b) light and electricity
c) energy from water	d) heat and electricity
  
- 6) The primary function of solar PV system is to \_\_\_\_\_.
 

a) convert wind energy to electric energy
b) convert sunlight to electric energy
c) store electric energy in batteries
d) produce mechanical energy

- Q.2 Answer the following. (Any Three) 06**
- a) What is the difference between direct and indirect water heating system?
  - b) Differentiate between Primary and secondary energy sources with example.
  - c) Explain the concept of solar Zenith angle ( $\theta_z$ ) and its significance in solar radiation calculation.
  - d) Explain Photovoltaic effect in simple term.
  - e) List any Two advantages of Solar PV system.
- Q.3 Answer the following. (Any Two) 06**
- a) Explain the working Principal of solar furnace.
  - b) Describe how power output of a solar array calculated.
  - c) Give two examples of energy chains and explain the transformation involved.
- Q.4 Answer the following (Any Two) 06**
- a) Explain the process of nuclear fusion in the sun and how it contributes to the sun's energy.
  - b) Describe the working principle of the solar cell.
  - c) Explain the relationship between voltage, current and resistance in a solar PV system using ohm's law.
- Q.5 Answer the following (Any One) 06**
- a) Explain common forms of energy.
  - b) Describe the working principle and component of box-type solar cooker.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November - 2025  
CHEMISTRY - II  
Chemistry in Daily Life (G04-GE-OE-202)**

Day & Date: Thursday, 06-11-2025  
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 not the use of lipstick.
  - a) Coloring lips
  - b) Hydrating
  - c) Anti-aging
  - d) Moisturizing
  
- 2) \_\_\_\_\_ is the primary chemical present in Chlorine Bleach.
  - a) Sodium Chloride
  - b) Sodium Hypochlorite
  - c) Sodium Hydroxide
  - d) Hydrogen Peroxide
  
- 3) \_\_\_\_\_ is commonly found in coffee
  - a) Lactose
  - b) Caffeine
  - c) Ethanol
  - d) Nicotine
  
- 4) Chemicals synthesized in laboratory, have sweet taste, but they don't have food value known as \_\_\_\_\_.
  - a) drug
  - b) artificial sweetener
  - c) flavoring agents
  - d) None of the above
  
- 5) \_\_\_\_\_ is most common adulterant used to enhance color of turmeric powder.
  - a) Starch
  - b) Urea
  - c) Chrome Yellow
  - d) Metanil Yellow
  
- 6) Adulteration by adding common salt to turmeric powder can be detected by \_\_\_\_\_ solution.
  - a) silver nitrate
  - b) formalin
  - c) sulphuric acid
  - d) potassium iodide

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

- a) Give the detection test of formalin in milk.
- b) What is food additive? Explain with one example.
- c) Explain common ingredients in face powder and their uses.

- d) What are the general tips for reducing risk of exposure to toxic household chemicals?
- e) Define milk and give any two components of milk.
- f) Give the detection test of oil soluble coal tar in chilli powder.

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

- a) Explain artificial sweetening agent aspartame.
- b) Discuss ingredients used in perfumes and state their uses.
- c) Explain methods for fat analysis in milk and butter.

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

- a) Describe common chemicals used in detergents and disinfectants and their uses.
- b) Explain permitted colour with any two examples.
- c) Discuss artificial sweetening agent: saccharin.

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

- a) Discuss the main ingredients used in toothpaste with their roles.
- b) How will you identify different adulterants in coriander powder and milk? Explain in detail.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November – 2025  
Botany  
Floriculture and Landscape Gardening (G04-GE-OE-203)**

Day & Date: Thursday, 06-11-2025  
Time: 03:00 PM To 04:30 PM

Max. Marks: 30

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

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

**06**

- 1) The objective of plant Nursery is \_\_\_\_\_.
  - a) To raise healthy and disease-free stocks
  - b) To save water
  - c) Preservation of plant species
  - d) All of the above
  
- 2) Vegetative propagation in plants is \_\_\_\_\_.
  - a) Form of asexual propagation
  - b) Form of sexual propagation
  - c) Both a and b
  - d) None of the above
  
- 3) \_\_\_\_\_ is the practice of growing and cultivating plants as part of horticulture.
  - a) Floriculture
  - b) Gardening
  - c) Pomoculture
  - d) None of the above
  
- 4) Landscape gardening is \_\_\_\_\_.
  - a) Process of making piece of land more attractive by plants
  - b) Process of making piece of land more attractive by animals
  - c) Both a and b
  - d) None of the above
  
- 5) The act of growing plants inside the house is called \_\_\_\_\_.
  - a) Indoor gardening
  - b) Outdoor gardening
  - c) Rock garden
  - d) All of the above
  
- 6) Cycas plant is commonly called as \_\_\_\_\_.
  - a) Sago palm
  - b) Areca palm
  - c) Blue palm
  - d) None of the above

- Q.2 Answer the following. (Any Three) 06**
- a) Define floriculture.
  - b) What is landscaping?
  - c) What is Rockery?
  - d) Define perennials.
  - e) Enlist any three vital tree species of gardening in our area.
- Q.3 Answer the following. (Any Two) 06**
- a) What is the importance of floriculture?
  - b) Explain in brief scope of landscaping.
  - c) Explain in brief potting (pot plants).
- Q.4 Answer the following (Any Two) 06**
- a) Write a short note on propagation of trees in gardens.
  - b) Explain in brief CAD application for gardening.
  - c) Write a short note on vertical gardening.
- Q.5 Answer the following (Any One) 06**
- a) Explain the art of Bonsai its principles and management.
  - b) Explain in brief bio-aesthetic planning with respect to Landscaping of schools & Public places.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November – 2025  
Zoology  
Human Nutrition and Health (G04-GE-204)**

Day & Date: Thursday, 06-11-2025  
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) A Substance needed by the body for growth, energy, repair and maintenance is called a \_\_\_\_\_.
  - a) nutrient
  - b) carbohydrate
  - c) Calorie
  - d) Fatty Acid
- 2) The Bread, Cereal, Rice and pasta group is a good source of \_\_\_\_\_.
  - a) Carbohydrate
  - b) Calcium
  - c) Vit. C
  - d) Vit. D
- 3) What is the main characteristic of Kwashiorkor?
  - a) muscle wasting
  - b) Edema (Swelling)
  - c) Bone Deformities
  - d) Night Blindness
- 4) Which is not a vitamin Deficiency?
  - a) Cheilosis
  - b) Scurvy
  - c) Rickets
  - d) Marasmus
- 5) What is the causative agent of typhoid fever?
  - a) E.Coli
  - b) Salmonella typhi
  - c) Staphylococcus aureus
  - d) Streptococcus pyogenes
- 6) Tunnel vision is caused by the
  - a) Barbiturates
  - b) Smoking
  - c) Alcohol
  - d) None of the above

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

- a) Give Biological significance of Iron.
- b) Define Balanced diet
- c) What are Lifestyle Diseases?
- d) What is mental health?
- e) What is Night Blindness and why is it caused?

- Q.3 Answer the following. (Any Two) 06**
- a) What is Immunization?
  - b) Brief about Micronutrients and their dietary source?
  - c) Explain causes and effects of Anemia.
- Q.4 Answer the following (Any Two) 06**
- a) Define concept of Health.
  - b) What is Yoga? And write benefits of Yoga.
  - c) Role of Yoga in human health.
- Q.5 Answer the following (Any One) 06**
- a) Explain in detail about water soluble and Fat Soluble Vitamins.
  - b) Explain in detail about Junk food and its Consequences on Health.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November - 2025  
MATHEMATICS  
Logical Reasoning (Verbal) (G04-GE-OE-210)**

Day & Date: Thursday, 06-11-2025  
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) A leap year has \_\_\_\_ days.
 

a) 364	b) 365
c) 366	d) 367
  
- 2) The face of dial of a watch is a circle whose circumference is divided into \_\_\_\_ equal part, called minute spaces.
 

a) 60	b) 30
c) 12	d) 24
  
- 3) A is the father of B, B is the sister of C, D is the husband of B. What is the relation of D to C?
 

a) Brother	b) Brother-in-Law
c) Father	d) Uncle
  
- 4) Complete the series A1, C3, E5, G7, \_\_\_\_\_.
 

a) I9	b) H8
c) K10	d) J11
  
- 5) A is to B as C is to D; car is to road as Boat is to \_\_\_\_\_.
 

a) River	b) Ocean
c) Lake	d) Water
  
- 6) Chalk : Blackboard
 

a) Type : Paint	b) Table : Chair
c) Ink : Paper	d) Door : Handle

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

- a) If in a language A is coded as 1, B is coded as 2 and so on. How is BIDDIC coded in that code? Explain.
- b) A and B are brothers. C and D are sister. A's son is D's brother. How is B related to C? Explain.
- c) Direction : Choose the odd pair of words and explain.  
 i) Volume : Litre  
 ii) Time : Seconds  
 iii) Length : Meter  
 iv) Resistance : Ohm  
 v) Pressure : Barometer
- d) A and B are married couple. X and Y are brother. X is the brother of A. How is Y related to B? Explain.
- e) Direction : Choose the odd pair of the words and explain.  
 i) Blacksmith : Anvil  
 ii) Carpenter : Saw  
 iii) Barber : Scissor  
 iv) Goldsmith : Ornaments  
 v) Sculptor : Chisel

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

- a) Find the missing value of the following  
 i)  $3 : 9 :: 5 : 25 :: 8 : \underline{\quad}$ .  
 ii)  $25 : 125 :: 9 : \underline{\quad}$ .
- b) Find the angle between the hour hand and the minute hands of a clock when the time is 3 hr 25 min.
- c) If  $A=1$ ,  $B=2$ ,  $C=3$ , and so on and  $COVER=63$  then  $BASIS=?$

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

- a) Direction: Choose the word which is least like the other words in the group.  
 i) (a) Curd (b) Butter  
 (c) Oil (d) Cheese  
 (e) Cream  
 ii) (a) Rose (b) Lotus  
 (c) Marigold (d) Lily  
 (e) Tulip
- b) A car travels from city A to city B at an average speed of 60 km/hr on the return journey the car travels at an average speed of 40 km/hr. What is the average speed of the car for the entire journey?
- c) If PAINT is coded as 74128 and EXCEL is coded as 93596 then how would you encode ACCEPT?

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

a) Direction: Choose the numeral pair group which is different from the other and explain it.

- |                  |             |
|------------------|-------------|
| i) (a) 42 – 4    | (b) 36 – 6  |
| (c) 32 – 2       | (d) 15 – 5  |
| ii) (a) 70 – 80  | (b) 54 – 62 |
| (c) 28 – 32      | (d) 21 – 24 |
| (e) 14 – 16      |             |
| iii) (a) 83 – 75 | (b) 58 – 50 |
| (c) 49 – 42      | (d) 25 – 17 |

b) Direction: In each of the following questions, a statement is given followed by two conclusions I & II. Give answer

- i) if only conclusion I follows
- ii) if only conclusion II follows
- iii) if either I or II follows
- iv) if neither I nor II follows and
- v) if both I & II follows

Explain in detail

- 1) Statement: Sealed tenders are invited from competent contractors experienced in executing construction jobs.  
Conclusion:
  - I) Tenders are invited only from experienced contractors.
  - II) It is difficult to find competent tenders in construction jobs.
- 2) Statement: Any young man who makes dowry as a condition for marriage discredits himself and dishonors womanhood.  
Conclusion:
  - I) Those who take dowry in marriage should be condemned by society.
  - II) Those who do not takes dowry in marriage respect womanhood.

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Set **P**

**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November - 2025  
STATISTICS  
Sample Survey Techniques (G04-GE-OE-211)**

Day & Date: Thursday, 06-11-2025  
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 difference between a statistic and the parameter is called \_\_\_\_\_.
  - a) Non-random
  - b) Probability
  - c) Sampling error
  - d) None of the above
  
- 2) A sampling frame is \_\_\_\_\_.
  - a) A summary of the various stages involved in designing a survey.
  - b) An outline view of all the main clusters of units in a sample.
  - c) A list of all the units in the population from which a sample will be selected.
  - d) A wooden frame used to display tables of random numbers.
  
- 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) A selection procedure of a sample having no involvement of probability is known as \_\_\_\_\_.
  - a) purposive sampling
  - b) judgment sampling
  - c) subjective sampling
  - d) All the above
  
- 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 sampling frame.
  - b) Explain economic surveys.
  - c) Describe systematic sampling.
  - d) Describe Educational surveys.
  - e) Explain random sample or probability sample.
- Q.3 Answer the following. (Any Two) 06**
- a) State characteristics of good questionnaire.
  - 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 sampling error.
  - b) Explain real life situations where systematic sampling is appropriate.
  - c) Explain simple random sampling with replacement.
- Q.5 Answer the following. (Any One) 06**
- a) Describe stratified sampling. Obtain an unbiased estimator for population mean.
  - b) Explain types of sample surveys.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November – 2025  
Computer Science  
Introduction to Internet and Web Design (G04-GE-208)**

Day & Date: Thursday, 06-11-2025  
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) What is the full form of internet?
  - a) InterContinental Network
  - b) Internal Network
  - c) Interconnected Network
  - d) International Network
- 2) Which tag do we use in HTML for inserting a line-break?
  - a) <a>
  - b) <br>
  - c) <b>
  - d) <pre>
- 3) Which element is used to get highlighted text in HTML5?
  - a) <highlight>
  - b) <b>
  - c) <mark>
  - d) <u>
- 4) Which of the following CSS property is used to make the text bold?
  - a) text-decoration: bold
  - b) font-weight: bold
  - c) font-style: bold
  - d) text-align: bold
- 5) Which of the following CSS property defines the space between cells in a table?
  - a) border-spacing
  - b) border-style
  - c) border
  - d) none of the mentioned
- 6) What does W3C stand for?
  - a) World Wide Web Consortium
  - b) World Wide Website Consortium
  - c) World Wide Website Community
  - d) World Wide Web Community

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

**06**

- a) What is HTML?
- b) What is an image map?
- c) What is website?
- d) What is CSS Box Model?
- e) What is comment? How to use.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain CSS properties.
  - b) Use of internet.
  - c) Explain structure of HTML5.
- Q.4 Answer the following (Any Two) 06**
- a) Explain padding properties.
  - b) Explain <div> & <span> element.
  - c) Explain formatting tags.
- Q.5 Answer the following (Any One) 06**
- a) Explain table properties with example.
  - b) Explain CSS types with example.

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Set **P**

**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November - 2025  
Electronics**

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

Day & Date: Thursday, 06-11-2025  
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) \_\_\_\_\_ monitors the water temperature in electric heaters/ geysers.
  - a) Heating element
  - b) Pressure valve
  - c) Circuit breaker
  - d) Thermostat
- 2) In a common TV remote \_\_\_\_\_ emits the signal to the TV.
  - a) Infrared LED
  - b) Microphone
  - c) LED
  - d) Speaker
- 3) The frequency used to heat the food in microwave oven is \_\_\_\_\_.
  - a) 2.45 KHz
  - b) 2.45 GHz
  - c) 2.45 MHz
  - d) 2450 Hz
- 4) In water purifiers RO stand for \_\_\_\_\_.
  - a) Rapid Osmosis
  - b) Reverse Osmosis
  - c) Regular Operation
  - d) Real Osmosis
- 5) UPS stands for \_\_\_\_\_.
  - a) Universal Power Source
  - b) Uni-junction Power Supply
  - c) Under Performance Supply
  - d) Uninterrupted Power Supply
- 6) In India the ac voltage for single phase is \_\_\_\_\_.
  - a) 110V
  - b) 440 V
  - c) 230 V
  - d) 325V

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

- a) State working principle of water heater.
- b) What are the types of microwave ovens?
- c) State the types of Electric Vehicle.
- d) State the applications of UPS.
- e) Enlist different parts of the washing machine.

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

- a) Explain in brief the working principles energy meter.
- b) Give the difference between AC and DC.
- c) Give the basic working principle of digital thermometer.

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

- a) State the different applications of multimeter.
- b) Explain the basic working principle of LED bulb and tube.
- c) Explain in brief the working of front-loading washing machine.

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

- a) What is alternating current? Define the Voltage, Current, Time period, frequency, and power of the ac signal.
- b) State the Safety tips for handling ac mains appliances and use of live tester and multimeter.

Seat No.	
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Set **P**

**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November – 2025  
Microbiology  
Food and Dairy Microbiology (G04-GE-OE-206)**

Day & Date: Thursday, 06-11-2025  
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 primary cause of food spoilage.
  - a) Proper storage conditions
  - b) Growth of microorganisms like bacteria and fungi
  - c) Low temperatures
  - d) Vacuum sealing
  
- 2) \_\_\_\_\_ is the purpose of pasteurization in dairy industries.
  - a) To improve taste only
  - b) To separate cream from milk
  - c) To cool milk rapidly
  - d) To kill harmful microorganisms and increase shelf life
  
- 3) \_\_\_\_\_ Microorganism is commonly used in the fermentation of bread.
 

a) <i>Lactobacillus</i>	b) <i>Saccharomyces cerevisiae</i>
c) <i>Escherichia coli</i>	d) <i>Salmonella</i>
  
- 4) \_\_\_\_\_ is a fermented milk product.
 

a) Butter	b) Yogurt
c) Fresh cream	d) Milk powder
  
- 5) Vacuum sealing helps to preserve food by: \_\_\_\_\_.
  - a) Removing oxygen and reducing oxidation
  - b) Increasing microbial growth
  - c) Lowering moisture content
  - d) Enhancing pH
  
- 6) \_\_\_\_\_ method can delay milk spoilage effectively.
 

a) Storing at room temperature	b) Exposure to sunlight
c) Pasteurization	d) Adding water

- Q.2 Answer the following. (Any Three) 06**
- a) How does temperature affect food spoilage?
  - b) What are the main causes of milk spoilage?
  - c) Define food preservation and enlist two methods of food preservation.
  - d) Define fermented food and give two examples of fermented food products.
  - e) What are the health benefits of consuming fermented milk products?
- Q.3 Answer the following. (Any Two) 06**
- a) Explain shortly Spoilage of different foods.
  - b) Write short note on fermented food products with applications.
  - c) What are the key steps in establishing a standard dairy industry?
- Q.4 Answer the following (Any Two) 06**
- a) Write a note on fermented milk products.
  - b) How does food spoilage impact health?
  - c) Explain shortly opportunities in food industry.
- Q.5 Answer the following (Any One) 06**
- a) Write in details on pasteurization.
  - b) Describe methods of food preservation.

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Set	P
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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November – 2025  
Geography  
Geography of Maharashtra - II (G04-GE-OE-207)**

Day & Date: Thursday, 06-11-2025  
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 alternatives from the options. 06**

- 1) The population day celebrated on \_\_\_\_\_.
  - a) 10 July
  - b) 11 July
  - c) 12 July
  - d) 13 July
- 2) The population of male and female distribution in a particular age group is called as population \_\_\_\_\_.
  - a) Sex ratio
  - b) Fertility
  - c) Age Composition
  - d) Mortality
- 3) The tribe 'Bhills' are found over \_\_\_\_\_ region of Maharashtra.
  - a) Himalaya
  - b) Nilgiri
  - c) Aravali
  - d) Deccan plateau
- 4) The population of male and female is called as \_\_\_\_\_.
  - a) Sex ratio
  - b) Fertility
  - c) Age Composition
  - d) Mortality
- 5) The lowest density of population reported from \_\_\_\_\_ district.
  - a) Gadchiroli
  - b) Mumbai
  - c) Nagpur
  - d) Nashik
- 6) \_\_\_\_\_ is a great industrial and trading centre.
  - a) Solapur
  - b) Mumbai
  - c) Kolhapur
  - d) Latur

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

- a) Write the name of tribal communities in Maharashtra.
- b) What is mean by internal migration?
- c) Define the sex ratio.
- d) Define 'Migration'.
- e) Define 'Population Density'.

- Q.3 Answer the following. (Any Two) 06**
- a) Describe the rural and urban population.
  - b) Describe the importance of literacy.
  - c) State remedies of population growth in Maharashtra.
- Q.4 Answer the following (Any Two) 06**
- a) Describe the types of migration in brief.
  - b) Discuss the elements that affect the literacy.
  - c) State the problems of population growth in Maharashtra.
- Q.5 Answer the following (Any One) 06**
- a) Explain the factors affecting on population distribution of the Maharashtra.
  - b) Explain the population distribution in the Maharashtra.

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

ऑक्टोबर/नोव्हेंबर — २०२५

**GEOLOGY**

**Environmental Geology (G04-GE-OE-209)**

वार, दिनांक: गुरुवार, ०६-११-२०२५

कमाल गुण: ३०

वेळ: दुपारी ०३:०० ते ०४:३०

सूचना : १) सर्व प्रश्न अनिवार्य आहेत.

२) उजवीकडील आकृत्या पूर्ण गुण दर्शवितात.

३) आवश्यक तेथे व्यवस्थित आणि सुबकपणे लेबल केलेले आकृती काढा

प्र.१ रिकाम्या जागा भरा.

०६

१) महाराष्ट्राचा बहुतांश भाग मातीचा आहे.

अ) वाळूचा

ब) वाळवंट

क) काळा कापूस

ड) खारट

२) खालीलपैकी कोणती मानवनिर्मित आपत्ती नाही?

अ) अपघात

ब) युद्ध

क) भूकंप

ड) क्षेपणास्त्र स्फोट

३) त्सुनामी कारणे ———.

अ) भूकंप

ब) ढग फुटणे

क) भूस्खलन

ड) यापैकी काहीही नाही

४) खालीलपैकी कोणता वातावरणचा क्षेत्र सर्वात पृथ्वीच्या पृष्ठभागाजवळ आहे?

अ) ट्रॉपोस्फीअर

ब) थर्मोस्फीअर

क) एक्सोस्फीअर

ड) बायोस्फीअर

५) महासागराचे पाणी सुमार ———

अ) ९५%

ब) ९७%

क) ३%

ड) ९९.९९%

६) पृथ्वीचा दक्षिण ध्रुव कायमचा ——— आहेत.

अ) नद्या

ब) महासागराचे पाणी

क) बर्फाचे थर

ड) हे सर्व

- प्र.२ खालील गोष्टी करण्याचा प्रयत्न करा. (कोणतेही तीन) 0६
- अ) वातावरणाची व्याख्या करा.  
 ब) भारतीय मान्सूनच्या प्रकारांची नावे द्या.  
 क) भूस्खलनाची व्याख्या करा.  
 ड) भूकंपाची व्याख्या करा.  
 ई) पर्यावरणाची व्याख्या करा?
- प्र.३ खालील गोष्टी करण्याचा प्रयत्न करा. (कोणतेही दोन) 0६
- अ) मातीचा प्रोफाइल स्पष्ट करा.  
 ब) जल प्रदूषणाची कारणे स्पष्ट करा.  
 क) पृथ्वीवरील भूतकाळातील हवामानावर एक टीप लिहा.
- प्र.४ खालील गोष्टी करण्याचा प्रयत्न करा. (कोणतेही दोन) 0६
- अ) हरितगृह परिणामांचे नियंत्रण उपाय स्पष्ट करा.  
 ब) ज्वालामुखीवर एक टीप लिहा.  
 क) जल प्रदूषणाचे परिणाम स्पष्ट करा.
- प्र.५ खालील गोष्टी करण्याचा प्रयत्न करा. (कोणताही एक) 0६
- अ) जलमंडलाची व्याख्या करा. जलचक्र वर्णन करा.  
 ब) जैवमंडलाची व्याख्या करा. जैवमंडलाचा घटक वर्णन करा.

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Set **P**

**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November - 2025  
GEOLOGY  
Environmental Geology (G04-GE-OE-209)**

Day & Date: Thursday, 06-11-2025  
Time: 03:00 PM To 04:30 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 from the options. 06**

- 1) Majority part of Maharashtra constitutes of \_\_\_\_\_ soil.
  - a) Sandy
  - b) Desert
  - c) Black cotton
  - d) Saline
  
- 2) Which of the following is not a Man-made Disaster?
  - a) Accidents
  - b) War
  - c) Earthquake
  - d) Missile explosions
  
- 3) Tsunamis are generated due to \_\_\_\_\_.
  - a) earthquakes
  - b) cloud bursts
  - c) landslides
  - d) None of these
  
- 4) Which of the following is lowest zone of atmosphere, close to earth surface?
  - a) Troposphere
  - b) Thermosphere
  - c) Exosphere
  - d) Biosphere
  
- 5) Ocean water is present about \_\_\_\_\_.
  - a) 95%
  - b) 97%
  - c) 3%
  - d) 99.99%
  
- 6) South pole of the earth is permanently covered with \_\_\_\_\_.
  - a) Rivers
  - b) Ocean water
  - c) ice sheets
  - d) all of these

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

- a) Define atmosphere
- b) Give the names of Types of Indian monsoon
- c) Define Landslide
- d) Define Earthquake
- e) Define Environment?

- Q.3 Attempt the following. (Any Two) 06**
- a) Explain Soil profile
  - b) Describe causes of water Pollution
  - c) Write a note on - past climate of earth
- Q.4 Attempt the following (Any Two) 06**
- a) Explain Controlling measures of Green house effects
  - b) Write a note on - Volcano
  - c) Explain effects of Water Pollution
- Q.5 Attempt the following (Any One) 06**
- a) Define Hydrosphere. Describe Hydrological Cycle
  - b) Define Biosphere. Describe component of Biosphere.

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Set **P**

**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November – 2025  
Environmental Science  
Divisions of the Environment (G04-GE-OE-212)**

Day & Date: Thursday, 06-11-2025  
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 ozone layer is present in \_\_\_\_\_.
 

a) Thermosphere	b) Stratosphere
c) Troposphere	d) Mesosphere
  
- 2) The uppermost part of the mantle and crust are called the \_\_\_\_\_.
 

a) Hydrosphere	b) Atmosphere
c) Lithosphere	d) Exosphere
  
- 3) Hydrosphere includes \_\_\_\_\_.
 

a) Water on the surface of the planet	b) Underground water
c) Water in the air	d) All of the above
  
- 4) What is the top layer of a soil profile called?
 

a) Subsoil	b) Bedrock
c) Topsoil	d) Parent material
  
- 5) Ponds and rivers are two types of \_\_\_\_\_.
 

a) marine biomes	b) rain forest biomes
c) freshwater biomes	d) estuary biome
  
- 6) Given what you know of Grassland Biomes which statement is most likely true?
  - a) Plants and animals are adapted to a lack of water due to heat
  - b) Plants and animals are adapted to a lack of water due to freezing temperatures
  - c) Rainfall amounts may not be enough to support many trees
  - d) Rainfall happens almost every day

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

- a) Write note on metamorphic rock.
- b) What is weather.
- c) Write note on ground water.
- d) Write Impact of Melting Ice Caps.
- e) Define Marine Biomes.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain water budget.
  - b) Write chemical properties of soil.
  - c) Write characteristics of Grassland.
- Q.4 Answer the following (Any Two) 06**
- a) Explain Lentic and Lotic systems.
  - b) Write note on atmospheric pressure.
  - c) Write types of precipitation.
- Q.5 Answer the following (Any One) 06**
- a) Explain soil profile with diagram.
  - b) Explain Structure of Atmosphere with diagram.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November – 2025  
English/ English for communication – II (ENG-201)**

Day & Date: Friday, 07-11-2025  
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) \_\_\_\_\_ skill help improve a communication.
 

a) Ignoring	b) Multitasking
c) active listening	d) Speaking continuously
  
- 2) \_\_\_\_\_ is the first step in listening.
 

a) Responding	b) evaluating
c) accepting	d) receiving
  
- 3) Watermark in email is used for \_\_\_\_\_ purpose.
 

a) Branding	b) contact
c) punctuality	d) trading
  
- 4) Newspaper report must be \_\_\_\_\_.
 

a) Fictitious	b) lengthy
c) imaginary	d) factual
  
- 5) Words used in formal emails should be more \_\_\_\_\_.
 

a) informal	b) complex
c) professional	d) personal
  
- 6) 'CC' stands for \_\_\_\_\_ in an Email.
 

a) Customer care	b) Carbon Copy
c) Complete Content	d) Copy Contact

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

- a) What care should be taken in newspaper report writing?
- b) What is the importance of good writing skill?
- c) What are the benefits of active listening?
- d) Why do we write the business letters?
- e) Comment on the types of listening?

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

- a) What is the importance of business letters?
- b) What is the importance of listening skills?
- c) Why do we write blogs?

**Q.4 Answer the following. (Any One)**

**12**

- a) Comment on the ways to improve the listening skill.
- b) Comment on the importance of email.

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Set	P
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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November – 2025  
Environmental Studies (ENS-24)**

Day & Date: Saturday, 08-11-2025  
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: 06**

- 1) The World Environment Day \_\_\_\_\_.  
a) 5<sup>th</sup> June                                      b) 5<sup>th</sup> May  
c) 5<sup>th</sup> October                                      d) 5<sup>th</sup> July
- 2) The term "Ecosystem" was first introduced by \_\_\_\_\_.  
a) Robert hook                                      b) Watson  
c) A. G. Tansley                                      d) E. P. Odum
- 3) Study of interrelationship between organism & environment is called \_\_\_\_\_.  
a) Ecology                                      b) Energy flow  
c) Food chain                                      d) Biodiversity
- 4) Transfer of Food material from one organism to next organism is called as \_\_\_\_\_.  
a) Food Web                                      b) Food Chain  
c) Ecosystem                                      d) Ecology
- 5) Green Plant is also called as \_\_\_\_\_.  
a) Autotrophic                                      b) Heterotrophic  
c) Chemotrophic                                      d) Consumer
- 6) Bacteria, virus, fungi include in \_\_\_\_\_.  
a) Consumer                                      b) Decomposer  
c) Producer                                      d) Plant

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

- a) Define- Environment.
- b) Example of Food Chain.
- c) Types of Biodiversity.
- d) Causes of Noise Pollution.
- e) Types of Environments.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain detail causes of Air Pollution.
  - b) Explain-Types of Ecosystems.
  - c) Explain in detail Scope of Environment.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain Renewable Energy.
  - b) Explain- Causes & Effect of Soil Pollution.
  - c) Nature of Environment.
- Q.5 Answer the following. (Any One) 06**
- a) Explain in detail term of Biodiversity.
  - b) Explain in detail Water Pollution -causes, effect, & control measure.



- प्र.२ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही तीन) 0६
- अ) रा.से.या.कार्यक्रमाचे वर्गीकरण सांगा.  
ब) रक्तदानाची आवश्यकता का आहे?  
क) राष्ट्रीय सेवा योजनेची उद्दिष्टे लिहा.  
ड) महिला सक्षमीकरणाची गरज का आहे?  
इ) माय भारत पोर्टलची संकल्पना सांगा.
- प्र.३ खालील प्रश्नांची थोडक्यात उत्तरे लिहा. (कोणतेही दोन) 0६
- अ) दत्तक खेड्यामध्ये नियमित उपक्रमावर चर्चा करा.  
ब) विशेष शिबिर कार्यक्रमातील पूर्वतयारी लिहा.  
क) रा.से.यो.चा इतिहास लिहा.
- प्र.४ खालील प्रश्नाचे सविस्तर उत्तर लिहा. (कोणताही एक) 0६
- अ) रा.से.यो. चे महत्व स्पष्ट करा.  
ब) मतदार जनजागृती आणि नावनोंदणी शिबीर यावर चर्चा करा
- प्र.५ दीर्घोत्तरी प्रश्नाची उत्तरे लिहा. 0६
- वृक्षरोपण आणि स्वच्छता मोहीम यावर वृत्तात द्या.

Seat No.	
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Set **P**

**B.Sc. (Plain) (Semester-II) (New) (NEP CBCS) Examination:  
October/November - 2025  
Co-Curricular Course  
National Service Scheme (CC-201)**

Day & Date: Monday, 10-11-2025  
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) \_\_\_\_\_ is celebrated as the N.S.S. day.
  - a) 24<sup>th</sup> September
  - b) 12<sup>th</sup> January
  - c) 15<sup>th</sup> August
  - d) 26<sup>th</sup> June
- 2) The N.S.S. emblem chakra has been taken from \_\_\_\_\_.
  - a) Red Fort
  - b) Ashok Chakra
  - c) Surya temple
  - d) Kutubminar
- 3) The National Service Scheme is started in the year of \_\_\_\_\_.
  - a) 1975
  - b) 1950
  - c) 1969
  - d) 1947
- 4) \_\_\_\_\_ is the number of hours the N.S.S. volunteers expected to work during the year.
  - a) 100
  - b) 240
  - c) 80
  - d) 150
- 5) The N.S.S. special camp is held for \_\_\_\_\_ days.
  - a) 7
  - b) 8
  - c) 9
  - d) 10
- 6) "Not me but you" is a motto of \_\_\_\_\_.
  - a) N.S.S.
  - b) Employment Guarantee Scheme
  - c) N.G.O
  - d) Self-Saving Group

**Q.2 Write answer of the following questions. (Any Three)****06**

- a) State the Classification of NSS Programme
- b) Why is important of Blood Donation.
- c) Write the Objective of NSS
- d) Why need is Women empowerment.
- e) State of Concept of My Bharat Portal.

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

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**B.Sc. (Plain) (सत्र - II) (नवीन) (NEP CBCS) परीक्षा:**  
**ऑक्टोबर/नोव्हेंबर - २०२५**  
**Co-Curricular Course**  
**National Cadet Corps (CC-202)**

वार, दिनांक: सोमवार, १०-११-२०२५  
वेळ: दुपारी ०३:०० ते ०४:३०

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) काही — गुण बदलता येत नाहीत.  
अ) नविन ब) दत्तक  
क) जन्मजात ड) नैसर्गिक
- २) एखाद्याला — मार्फत व्यक्त करता येते.  
अ) तोंडी ब) हावभाव  
क) लेखी ड) वरीलपैकी सर्व
- ३) व्यक्तिमत्व — नुसार बदलते.  
अ) प्रत्येक व्यक्ती ब) वेळ  
क) काम ड) वरीलपैकी कोणतेही नाही.
- ४) स्वतःला खुप वेगळे समजणे म्हणजे —.  
अ) अतिअहंकारी व्यक्तिमत्व ब) स्वयंप्रेरित  
क) आनंदी ड) वास्तव
- प्र.२ खालील प्रश्नांची उत्तरे लिहा (कोणतेही दोन) ०४
- अ) व्यक्तिमत्व विकासासाठी कोणत्याही दोन टिप सांगा.  
ब) व्यक्तिमत्व विकासासाठीचे कोणतेही दोन घटक सांगा.  
क) 'समर्थन आणि आदर' ची उदाहरणे द्या.  
ड) प्रामाणिकपणाची उदाहरणे द्या.
- प्र.३ चारित्र कसे सुधारावे? यावर टिप लिहा. ०३
- प्र.४ व्यक्तिमत्व विकासामध्ये एन.सी.सी. कॅडेट ची भूमिका स्पष्ट करा. ०४
- किंवा**
- उत्तम नेतृत्वासाठी महत्वाची मूल्ये स्पष्ट करा.

<b>Seat No.</b>	
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<b>Set</b>	<b>P</b>
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**B.Sc. (Plain) (Semester-II) (New) (NEP CBCS) Examination:  
October/November - 2025  
Co-Curricular Course  
National Cadet Corps (CC-202)**

Day & Date: Monday, 10-11-2025  
Time: 03:00 PM To 04:30 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) Few \_\_\_\_\_ traits can not changed.
 

a) new	b) adopted
c) inborn	d) natural
  
  - 2) One can express through \_\_\_\_\_.
 

a) oral	b) gestures
c) written	d) all of the above
  
  - 3) The personality vary as per \_\_\_\_\_.
 

a) Individuals	b) time
c) work	d) None of these
  
  - 4) Thinking oneself very different is \_\_\_\_\_.
 

a) superego	b) self motivation
c) pleasure	d) reality
- Q.2 Attempt of the following questions. (Any Two)** **04**
- a) Mention any two tips for personality development
  - b) State any two factors for personality development
  - c) Give example of support & respect.
  - d) Give examples of honesty.
- Q.3 Write a note on How to improve character?** **03**
- Q.4 Explain role of NCC cadet in personality development** **04**
- OR**
- Explain important values for a good leader.

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Set	P
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**B.Sc. (Plain) (सत्र - II) (नवीन) (NEP CBCS) परीक्षा:**

ऑक्टोबर/नोव्हेंबर — २०२५

**Co-Curricular Course  
Sports (CC-203)**

वार, दिनांक: सोमवार, १०-११-२०२५

कमाल गुण: १५

वेळ: दुपारी ०३:०० ते ०४:३०

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

- प्र.१ खालील दिलेल्या योग्य पर्याय निवडून गाळलेल्या जागा भरा. ०४
- १) खेळामध्ये एक अद्वितीय — असतो.
- अ) तंत्राचा संच ब) हालचालीचा संच  
क) तंत्राचा व हालचालीचा संच ड) यापैकी काहीही नाही
- २) सांघिक खेळासाठी — आवश्यक आहे.
- अ) समन्वय ब) रणनिती  
क) सांघिक कार्य ड) वरील सर्व
- ३) सचिन तेंडुलकर हा — खेळातील प्रसिद्ध खेळाडू आहे.
- अ) फुटबॉल ब) टेनिस  
क) क्रिकेट ड) हॉकी
- ४) खेळ हा — प्रकारचा उपक्रम आहे.
- अ) मानसिक ब) शारिरीक  
क) सामाजिक ड) वरील सर्व
- प्र.२ टिपा लिहा. (कोणत्याही तीन) ०६
- अ) खेळाचे मानसिक फायदे  
ब) वैयक्तिक खेळाची यादी  
क) खेळाद्वारे शारिरीक विकास  
ड) खेळाचा आधुनिक इतिहास  
इ) खेळातील शारिरीक हालचाली
- प्र.३ खालील प्रश्नांची उत्तरे लिहा. (कोणताही एक) ०५
- अ) खेळाची संकल्पना स्पष्ट करा.  
ब) सांघिक खेळाविषयी सविस्तर माहिती लिहा.

Seat No.	
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Set **P**

**B.Sc. (Plain) (Semester-II) (New) (NEP CBCS) Examination:  
October/November – 2025  
Co-Curricular Course  
Sports (CC-203)**

Day & Date: Monday, 10-11-2025  
Time: 03:00 PM To 04:30 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) Sport involves a unique \_\_\_\_\_.
  - a) set of techniques
  - b) set of movements
  - c) set of technique and movements
  - d) none of These
  
- 2) Team sport is requires \_\_\_\_\_.
 

a) Coordination	b) Strategy
c) teamwork	d) Above all
  
- 3) Sachin Tendulkar is popular sportsmen of \_\_\_\_\_ sports.
 

a) Football	b) Tennis
c) Cricket	d) Hockey
  
- 4) A sport is \_\_\_\_\_ Activity.
 

a) Mental	b) Physical
c) Social	d) Above all

**Q.2 Write short notes. (Any Three) 06**

- a) Mental Benefits of sports.
- b) List of individual sports
- c) Physical Development in sports
- d) Modern History of sports
- e) Physical movements in sports.

**Q.3 Answer the following questions. (Any One) 05**

- a) Explain the concept of sports.

OR

- b) Explain about Team sports.

Seat No.	
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Set P

**B.Sc. (Plain) (सत्र - II) (नवीन) (NEP CBCS) परीक्षा:**  
**ऑक्टोबर / नोव्हेंबर — २०२५**  
**Co-Curricular Course**  
**Culture (CC-204)**

वार, दिनांक: सोमवार, १०-११-२०२५

कमाल गुण: ३०

वेळ: दुपारी ०३:०० ते ०४:३०

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

प्र.१ खालील दिलेले योग्य पर्याय निवडून गाळलेल्या जागा भरा. ०६

- १) संवाद न करता केवळ हावभाव याद्वारे अभिनय केला जातो त्यास ---- म्हणतात.  
 अ) लावणी ब) अभिनय  
 क) मुकनाटय ड) एकांकी
- २) अजिंठा येथे कोरलेल्या लेण्याचा ---- प्रकारात येतात.  
 अ) संगीत ब) शिल्पकला  
 क) नाटयकला ड) वास्तुकला
- ३) ---- हे उत्कृष्ट तबलावादक म्हणून ओळखले जातात.  
 अ) अजय अतुल ब) उस्ताद जाकिरहुसेन  
 क) राम कदम ड) यापैकी नाही
- ४) खालील वादय भजनात वापरले जाते नाही ----.  
 अ) पखवाज ब) हार्मोनियम  
 क) टाळ ड) गिटार
- ५) ---- नाटय प्रकार रस्त्यावर करता येतो.  
 अ) एकांकिका ब) लघुनाटय  
 क) पथनाटय ड) एकपात्री
- ६) काव्य सादरीकरणास ---- म्हणतात.  
 अ) कवितावाचन ब) भजन  
 क) मुकनाटय ड) लेखन

- प्र.२ टिपा लिहा. (कोणत्याही दोन) 0६
- अ) संगीत या विषयाची व्याख्या लिहा.  
ब) तुम्हाला माहिती असलेल्या कोणत्याही चार शिल्पांची नावे लिहा.  
क) भारतातील कोणत्याही चार प्रसिद्ध गायकांची नावे लिहा.  
ड) भारतातील कोणत्याही चार प्रसिद्ध वादकांची नावे लिहा.
- प्र.३ खालील प्रश्न सोडवा. 0६
- भजनात वापरल्या जाणाऱ्या साहित्याचा नावे लिहा व तुम्हाला माहित असलेल्या एकादया भजनाचा (भक्तीगीत) सारांश लिहा.
- प्र.४ खालील प्रश्नाचे उत्तर लिहा. (कोणताही एक) १२
- अ) अभिनय म्हणजे काय सांगा व अभिनयाचे प्रकार सांगून सविस्तर उत्तर लिहा.
- किंवा**
- ब) रांगोळी या कला प्रकाराचे भारतीय समाजातील स्थान लिहा व रांगोळी कोणत्या ठिकाणी व कोणत्या प्रसंगात काढली जाते सविस्तर उत्तर लिहा.

Seat No.	
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Set	P
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**B.Sc. (Plain) (Semester-II) (New) (NEP CBCS) Examination:  
October/November - 2025  
Co-Curricular Course  
Culture (CC-204)**

Day &amp; Date: Monday, 10-11-2025

Max. Marks: 30

Time: 03:00 PM To 04:30 PM

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

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

- 1) Acting without dialogue is done only through gestures and is called \_\_\_\_\_.
  - a) Lavani
  - b) Acting
  - c) Mute
  - d) Ekaanki
- 2) The caves carved at Ajanta are of \_\_\_\_\_ type
  - a) Music
  - b) Sculpture
  - c) Drama
  - d) Architecture
- 3) \_\_\_\_\_ He is Known as an excellent tabla player
  - a) Ajay Atul
  - b) Ustad Zakir Hussain
  - c) Ram Kadam
  - d) None of these
- 4) The following instrument is not used in Bhajan \_\_\_\_\_
  - a) Pakhwaj
  - b) Harmonium
  - c) Tal
  - d) Guitar
- 5) \_\_\_\_\_ Drama can be performed on the street.
  - a) Ekaanki
  - b) Short play
  - c) Pathanatti
  - d) Ekapatri
- 6) Poetry presentation is called \_\_\_\_\_.
  - a) Poetry recitation
  - b) Bhajan
  - c) Mute
  - d) Writing

**Q.2 Write Notes. (Any Two) 06**

- a) Write a definition of the subject of music.
- b) Write the names of any four sculptures that you know.
- c) Write the names of any four famous singers in India.
- d) Write the names of any four famous musicians in India.

**Q.3 Solve the following questions. 06**

Write the names of the materials used in Bhajans and write a summary of the Ekadaya Bhajan (Bhakti Geet) that you know.

**Q.4 Solve the following questions (Any One)**

**12**

**a)** Explain what is acting and write a detailed answer by mentioning the types of acting.

**OR**

**b)** Write the place of the art form Rangoli in Indian Society and write a detailed answer in which place and on which occasion Rangoli is drawn.

Seat No.	
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Set P

**B.Sc. (Plain) (सत्र - II) (नवीन) (NEP CBCS) परीक्षा:**  
**ऑक्टोबर / नोव्हेंबर - २०२५**  
**Co-Curricular Course**  
**Health Wellness, Fitness (CC-205)**

वार, दिनांक: सोमवार, १०-११-२०२५  
 वेळ: दुपारी ०३:०० ते ०४:३०

कमाल गुण: १५

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

**प्र.१ योग्य पर्याय लिहा.**

०४

- १) — हे रोगप्रतिकारक शक्तीचे प्राथमिक कार्य आहे?  
 अ) शरीराचे तापमान नियंत्रित करणे  
 ब) रक्तातील ऑक्सिजन वाहतूक चालणे.  
 क) संसर्गजन्य रोगाविरुद्ध  
 ड) वरील सर्व
- २) — जीवनसत्त्वा अभावी स्क्र्वी हा रोग होतो.  
 अ) क  
 ब) ड  
 क) ब  
 ड) अ
- ३) जागतिक आरोग्य संघटनेचे मुख्यालय — या ठिकाणी आहे.  
 अ) ढाका  
 ब) कतार  
 क) भोपाळ  
 ड) जिनेव्हा
- ४) — याला वैयक्तिक स्वच्छता म्हणता येईल.  
 अ) हात धुणे  
 ब) नखे काढणे  
 क) दात घासणे  
 ड) वरील सर्व

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

०६

- अ) आरोग्याची व्याख्या लिहा.  
 ब) शारीरिक तंदुरुस्तीचे घटक लिहा.  
 क) वैयक्तिक स्वच्छता मधील दोन घटक लिहा.  
 ड) एन. आय. एच. चे कार्य लिहा.

प्र.३ सविस्तर उत्तरे लिहा. (कोणताही एक)

अ) समतोल आहार म्हणजे काय सविस्तर लिहा.

किंवा

ब) जागतिक आरोग्य संघटनेचे कार्य लिहा.

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Set	P
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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November - 2025  
Co-Curricular Course  
Health Wellness, Fitness (CC-205)**

Day & Date: Monday, 10-11-2025  
Time: 03:00 PM To 04:30 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 primary function of the immune system?
  - a) Regulating body temperature
  - b) Transporting oxygen in the blood
  - c) Fighting infectious diseases
  - d) All of the above.
  
- 2) \_\_\_\_\_ Vitamin deficiency causes scurvy.
 

a) C	b) D
c) B	d) A
  
- 3) The headquarter of the World Health Organization is located in \_\_\_\_\_.
 

a) Dhaka	b) Qatar
c) Bhopal	d) Geneva
  
- 4) \_\_\_\_\_ can be called personal hygiene.
 

a) Washing hands	b) Cutting nails
c) Brushing teeth	d) All of the above

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

- a) Write the definition of Health.
- b) Write the components of physical fitness.
- c) Write two components of personal hygiene.
- d) Write the functions of NIH.

**Q.3 Write the detail answer (Any One) 05**

- a) Describe the balanced diet in detail?
- b) Write the Functions of World Health Organization?

Seat No.	
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Set **P**

**B.Sc. (Plain) (सत्र - II) (नवीन) (NEP CBCS) परीक्षा:**  
**ऑक्टोबर / नोव्हेंबर — २०२५**  
**Co-Curricular Course**  
**Yoga Edu./Performing Arts (CC-206)**

वार, दिनांक: सोमवार, १०-११-२०२५  
 वेळ: दुपारी ०३:०० ते ०४:३०

कमाल गुण: १५

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

- प्र.१ योग्य पर्याय लिहा. ०४**
- १) प्राणायाम ही क्रिया — यांच्याशी निगडित आहे.  
 अ) स्नायू संस्था                      ब) श्वसन संस्था  
 क) मज्जा संस्था                      ड) रक्ताभिसरण संस्था
- २) — हे पोटावरील आसन आहे.  
 अ) भुजंगासन                      ब) पद्मासन  
 क) वक्रासन                      ड) शवासन
- ३) योग दिवस म्हणून खालीलपैकी कोणता दिवस साजरा केला जातो?  
 अ) ८ मार्च                      ब) १ मे  
 क) २१ जून                      ड) १५ ऑगस्ट
- ४) — हे बैठ्या स्थितीतील आसन आहे.  
 अ) पद्मासन                      ब) भुजंगासन  
 क) ताडासन                      ड) शवासन
- प्र.२ खालील प्रश्नांची उत्तरे लिहा (कोणतेही तीन) ०६**
- अ) योग साधनेचे फायदे सांगा.  
 ब) योगाच्या व्याख्या लिहा  
 क) शीतली प्राणायाम कृती लिहा.  
 ड) वक्रासन या आसना विषयी कृती लिहा.
- प्र.३ सविस्तर उत्तरे लिहा. (कोणताही एक) ०५**
- अ) कोणत्याही पाच आसनांची कृती लिहा व त्याचे फायदे सांगा.  
 किंवा  
 ब) प्राणायामाची व्याख्या देऊन माहिती लिहा.

Seat No.	
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Set	P
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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November - 2025  
Co-Curricular Course  
Yoga Edu./Performing Arts (CC-206)**

Day & Date: Monday, 10-11-2025  
Time: 03:00 PM To 04:30 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) Pranayama is associated with the \_\_\_\_\_ system.
 

a) Muscular system	b) Respiratory system
c) Nervous system	d) Circulatory system
- 2) \_\_\_\_\_ is a posture done on the abdomen.
 

a) Bhujangasana	b) Padmasana
c) Vakrasana	d) Shavasana
- 3) Which of the following days is celebrated as Yoga Day?
 

a) 8th March	b) 1st May
c) 21st June	d) 15 th August
- 4) \_\_\_\_\_ is a seated posture.
 

a) Padmasana	b) Bhujangasana
c) Tadasana	d) Shavasana

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

- a) Explain the benefits of yoga practice.
- b) Write the definitions of yoga.
- c) Write the procedure for Sheetal Pranayama.
- d) Write the procedure of Vakrasana (twisting pose).

**Q.3 Write the detail answer. (Any One) 05**

- a) Write the procedure and benefits of any five yoga postures.
- OR**
- b) Give the definition of Pranayama and explain it.

Seat  
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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November - 2025  
Physics - II  
Electricity, Magnetism and Basic Electronics (G04-0201)**

Day & Date: Tuesday, 11-11-2025  
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 from the options. 06**

- 1) Growth of current in the circuit containing series combination of inductor and resistance is \_\_\_\_\_.  
a) exponential                      b) linear  
c) oscillatory                        d) sinusoidal
- 2) At resonance, current in the parallel LCR circuit is \_\_\_\_\_.  
a) minimum                            b) maximum  
c) constant                             d) zero
- 3) In Ballistic galvanometer the coil is suspended in \_\_\_\_\_ magnetic field.  
a) uniform                             b) radial  
c) non-uniform                        d) varying
- 4) The \_\_\_\_\_ circuit removes negative half cycle from input voltage signal.  
a) negative clipper                    b) positive clipper  
c) positive clamper                   d) negative clamper
- 5) The \_\_\_\_\_ of a bi-junction transistor is heavily doped.  
a) collector                            b) base  
c) emitter                                d) base and emitter
- 6) If  $\beta$  of transistor is 99, then its  $\alpha$  is \_\_\_\_\_.  
a) 9.9                                    b) 0.98  
c) 0.099                                d) 0.99

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

- a) Define time constant of LR circuit.
- b) Define figure of merit and voltage sensitivity.
- c) Define ripple factor.
- d) Draw the circuit symbols of npn and pnp transistors.
- e) Define the terms: reactance, susceptance.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain positive and negative clamper.
  - b) Establish relation between  $\alpha$  and  $\beta$ .
  - c) In series L-C-R circuit,  $L = 25 \mu H$  and  $C = 100 \mu F$ . What is the frequency of a.c. source so that circuit resonates.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain decay of current in L-R circuit.
  - b) Explain the working of Owen's bridge.
  - c) Explain Zener diode as a voltage regulator.
- Q.5 Answer the following. (Any One) 06**
- a) With neat diagram explain construction and working of Ballistic Galvanometer.
  - b) With neat diagram derive an expression for discharging of capacitor through resistor.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November - 2025  
Chemistry - II  
Organic and Analytical Chemistry (G04-0202)**

Day & Date: Wednesday, 12-11-2025  
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)  $NO_2^+$  is example of \_\_\_\_\_.
  - a) neutral electrophile
  - b) nucleophile
  - c) neutral spices
  - d) positively charged electrophile
- 2) C – C bond length is maximum in \_\_\_\_\_.
  - a)  $CH_2 = CH - CH = CH_2$
  - b)  $CH \equiv CH$
  - c)  $CH_2 = CH_2$
  - d)  $CH_3 - CH_3$
- 3) Mechanical interference caused near reaction centre due to presence of ortho alkyl group is known as \_\_\_\_\_ effect.
  - a) resonance
  - b) steric
  - c) inductive
  - d) hyperconjugation
- 4) \_\_\_\_\_ has only one chiral centre.
  - a) tartaric acid
  - b) n-butane
  - c) lactic acid
  - d) 2,3-dihydroxy butanoic acid
- 5)  $C_5C1$  has \_\_\_\_\_ stiochiometry.
  - a) 1:1
  - b) 1:2
  - c) 2:1
  - d) 3:2
- 6) Empirical formula of benzene is \_\_\_\_\_.
  - a)  $C_6H_{12}$
  - b)  $C_6H_6$
  - c)  $CH$
  - d)  $C_2H_2$

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

- a) Define homolytic bond breaking with example.
- b) Define rearrangement reaction with example.
- c) Define bond angle & bond energy.
- d) Define co-ordination number & unit cell.
- e) Draw neat, labelled diagram to determine nitrogen by kjeldahl's method.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain centre of symmetry.
  - b) Explain hybridisation in acetylene.
  - c) Give any three advantages of refractometer.
- Q.4 Answer the following (Any Two) 06**
- a) What is the substitution reaction? Explain substitution reaction with example.
  - b) Explain diastereoisomers with examples.
  - c) How ionic bond is formed.
- Q.5 Answer the following (Any One) 06**
- a) Define qualitative analysis. Explain carius method for estimation of halogen from organic compound.
  - b) How will you determine viscosity of liquid experimentally?

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November - 2025  
MATHEMATICS - II  
Geometry and Differential Equation (G04-0210)**

Day & Date: Thursday, 13-11-2025  
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 general second-degree equation represents an ellipse if and only if \_\_\_\_.
- a)  $\Delta \neq 0, ab - h^2 < 0$                       b)  $\Delta \neq 0, h^2 - ab < 0$   
c)  $\Delta = 0, ab - h^2 < 0$                       d)  $\Delta = 0, h^2 - ab > 0$
- 2) Two planes  $a_1x + b_1y + c_1z + d_1 = 0$ ,  $a_2x + b_2y + c_2z + d_2 = 0$  are perpendicular if \_\_\_\_.
- a)  $a_1a_2 + b_1b_2 + c_1c_2 = 0$                       b)  $a_1a_2 = b_1b_2 = c_1c_2$   
c)  $\frac{a_1}{a_2} + \frac{b_1}{b_2} + \frac{c_1}{c_2} = 0$                       d)  $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$
- 3) The number of arbitrary constants in the equation  $ax + by + cz + d = 0$  is \_\_\_\_.
- a) one    b) two  
c) three    d) four
- 4) The differential equation of the form  $\frac{dy}{dx} + py = Q \cdot y^n$  is called \_\_\_\_ equation.
- a) Euler's    b) Linear  
c) Clairaut's    d) Bernoulli's
- 5)  $\frac{1}{D^2}(x^3) =$  \_\_\_\_.
- a)  $\frac{x^3}{3}$     b)  $\frac{x^4}{12}$   
c)  $\frac{x^6}{60}$     d)  $\frac{x^5}{20}$
- 6) If  $m_1$  is repeated twice, then corresponding C.F. is \_\_\_\_.
- a)  $c_1e^{m_1x} + c_2e^{m_2x}$                       b)  $(c_1 + c_2x)e^{m_1x}$   
c)  $(c_1 + c_2)e^{m_1x}$                       d)  $(c_1 + c_2x)$

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

- a) Find the equation of transformation using translation [When origin is shifted to  $o'(h,k)$ ].
- b) Find the angle between two given planes  
 $a_1x + b_1y + c_1z + d_1 = 0$   
 $a_2x + b_2y + c_2z + d_2 = 0$
- c) Explain any two rules for finding Integrating Factors [I.F.]
- d) Solve  $\frac{d^4y}{dx^4} - 5\frac{d^2y}{dx^2} + 4y = 0$
- e) Find the equation of the plane where X-intercept, Y-intercept and Z-intercept are 3, 4 and 7 respectively.

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

- a) Find the solution of Linear differential equation  
 $\frac{dy}{dx} + PY = Q$
- b) Find the equation of transformations using rotation [when axes are rotated through an angle  $\theta$ ].
- c) Find the equation of plane in Normal Form.

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

- a) Find the equation of plane in terms of the intercepts made on three axes.
- b) Identify the conic given by the equation.  
 $4x^2 - 12xy + 9y^2 + 4x + y - 5 = 0$
- c) Find the solution of the equation  $f(D)y = 0$   
 When roots are real and non-repeated.

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

- a) Find the length of perpendicular from a point  $P(x_1, y_1, z_1)$  to a plane  
 $Ax + By + Cz + D = 0$
- b) The necessary and sufficient condition for the differential equation  
 $M dx + N dy = 0$  be exact is that  $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$

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Set **P**

**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November – 2025  
Microbiology – II  
Applied Microbiology (G04-0206)**

Day & Date: Thursday, 13-11-2025  
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.  
4) Use of log tables and calculators is allowed.

**Q.1 Rewrite the following sentences choosing the correct alternatives. 06**

- 1) \_\_\_\_ technique used a high velocity stream of air to capture microorganisms on solid media.
  - a) Centrifugation
  - b) Filtration
  - c) Impaction
  - d) Pasteurisation
  
- 2) The main source of microorganisms in air is \_\_\_\_\_.
  - a) U.V.light
  - b) Human activities like talking, coughing, sneezing etc
  - c) Air conditioners
  - d) Floor tiles
  
- 3) \_\_\_\_ organism is commonly used as indicator of water contamination.
  - a) Staphylococcus aureus
  - b) Escherichia coli
  - c) Clostridium tetani
  - d) Mycobacterium tuberculosis
  
- 4) \_\_\_\_ is the main objective of sewage treatment.
  - a) Remove pathogens and reduce organic matter
  - b) Increase microbial food
  - c) Add nutrients to water
  - d) Increase water temperature
  
- 5) Pasteurisation of milk is mainly done to \_\_\_\_\_.
  - a) Add flavour
  - b) Improve cream line
  - c) Destroy pathogenic microorganisms
  - d) Remove fat content
  
- 6) Pandemic is the disease which is spread \_\_\_\_\_.
  - a) in a small area
  - b) seasonally
  - c) throughout the world
  - d) only in animals

- Q.2 Answer the following. (Any Three) 06**
- a) What is prophylaxis?
  - b) Give composition of milk.
  - c) Definition of sewage.
  - d) What are the different sources of microorganisms in water?
  - e) What are droplet nuclei.
- Q.3 Answer the following. (Any Two) 06**
- a) Write an account on types of sewage.
  - b) Explain the MBRT test.
  - c) Write on different modes of transmission of diseases.
- Q.4 Answer the following (Any Two) 06**
- a) Write an account on MPN.
  - b) What is Pasteurisation? Explain phosphatase test with its significance.
  - c) Write an account on different types of infections.
- Q.5 Answer the following (Any One) 06**
- a) Explain the IMViC test used for detection and differentiation of coliforms.
  - b) Describe the microbial examination of air in detail.

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Set **P**

**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November – 2025  
Statistics - II  
Elementary Statistics (G04-0211)**

Day & Date: Friday, 14-11-2025  
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 alternatives from the options. 06**

- 1) Sample space of appearing for an examination till passing is \_\_\_\_\_  
sample space
  - a) discrete
  - b) countably infinite
  - c) continuous
  - d) none of these
  
- 2) Two dice are thrown simultaneously. The probability of getting a sum of 9 is: \_\_\_\_\_.
  - a)  $1/10$
  - b)  $3/10$
  - c)  $1/9$
  - d)  $4/9$
  
- 3) In Bayes' theorem the events  $A_1, A_2, A_3, \dots, A_n$  are
  - a) independent
  - b) equally likely
  - c) mutually exclusive and exhaustive
  - d) none of these
  
- 4) If  $A$  and  $B$  are independent events with  $P(A) = 0.3, P(B) = 0.5$  and  $P(B/A) = k$ , then value  $k$  is \_\_\_\_\_.
  - a) 0.5
  - b) 0
  - c) 0.7
  - d) 0.3
  
- 5) If all the points of a scatter diagram lie on a straight line falling from left upper corner to the right bottom corner, the correlation is called \_\_\_\_\_.
  - a) Zero correlation
  - b) Perfect negative correlation
  - c) Perfect positive correlation
  - d) High degree of positive correlation

- 6) If the value of correlation coefficient between  $X$  and  $Y$  is  $0.5$ . If the regression coefficient of  $Y$  on  $X$  is  $-\frac{1}{8}$ , then the regression coefficient of  $X$  on  $Y$  is \_\_\_\_\_.
- |                   |         |
|-------------------|---------|
| a) $-\frac{1}{2}$ | b) $-2$ |
| c) $2$            | d) $-4$ |

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

- a) Define elementary event and compound event.
- b) Define axiomatic definition of probability.
- c) Define Pairwise independence of events  $A, B$  and  $C$ .
- d) Define negative correlation with one example.
- e) Given  $b_{yx} = 1.6, Cov(X, Y) = 256$ . Find  $V(X)$ .

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

- a) If a pair of a fair dice is thrown, what is the event of
  - i) getting a doublet
  - ii) getting sum as 1
  - iii) getting sum less than 5
- b) with usual notation prove that
  - i)  $P(A \cap \bar{B}) = P(A) - P(A \cap B)$
  - ii)  $P(\bar{A} \cap B) = P(B) - P(A \cap B)$
- c) What is the effect of change of origin and scale on correlation?

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

- a) If  $A$  and  $B$  are mutually exclusive events, prove that

$$P(A/A \cup B) = \frac{P(A)}{P(A) + P(B)}$$

- b) If  $A$  and  $B$  are independent then  $\bar{A}$  and  $\bar{B}$  are independent
- c) The equations of two regression lines are  $3X + 2Y = 26$  and  $6X + Y = 31$   
Find
  - i) Means of  $X$  and  $Y$
  - ii) Coefficient of correlation between  $X$  and  $Y$ .

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

- a) State and prove Bayes theorem.
- b) Derive the equations of lines of regression of  $Y$  on  $X$  by the method of least square.

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Set **P**

**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November – 2025  
Botany - II  
Plant Ecology and Taxonomy of Angiosperm (G04-0203)**

Day & Date: Friday, 14-11-2025  
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) Multilayered epidermis is found in \_\_\_\_\_.  
a) hydrophytes                                b) mesophytes  
c) xerophytes                                    d) none of these
  
- 2) Lead Botanical Garden is present at \_\_\_\_\_.  
a) Calcutta                                      b) Ooty  
c) Benglore                                      d) Shivaji University, Kolhapur
  
- 3) The \_\_\_\_\_ stage is the pioneer stage of hydrosere  
a) forest    b) reed swamp  
c) phytoplankton                                d) floating
  
- 4) The reproductive character of family includes \_\_\_\_\_.  
a) stem    b) leaf  
c) root    d) flower
  
- 5) The plants growing in xeric conditions are known as \_\_\_\_\_.  
a) hydrophytes                                 b) xerophytes  
c) epiphytes                                      d) mesophytes
  
- 6) *Bougainvillea* belongs to the family \_\_\_\_\_.  
a) Caesalpiniaceae                              b) Solanaceae  
c) Nyctaginaceae                                d) Amaryllidaceae

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

**06**

- a) Enlist the climatic factors.
- b) What is ICBN?
- c) Enlist the stages of xerosere.
- d) Write any two distinguishing characters of family Caesalpiniaceae.
- e) Define primary succession.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the anatomical adaptations in hydrophytes.
  - b) Write the primitive characters of flower.
  - c) Explain the process of ecological succession.
- Q.4 Answer the following (Any Two) 06**
- a) Give an account of components of soil.
  - b) Explain morphological adaptations in xerophytes.
  - c) Give outline of Bentham and Hooker's System of classification.
- Q.5 Answer the following (Any One) 06**
- a) Explain in brief stages of Hydrosere.
  - b) Give the distinguishing characters with economic importance of family Solanaceae.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November – 2025  
Zoology – II  
Animal diversity - II Chordates (G04-0204)**

Day & Date: Saturday, 15-11-2025  
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.

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

**06**

- 1) \_\_\_\_\_ belongs to Urochordata.
 

a) Scoliodon	b) Herdmani
c) Amphioxus	d) Labeo
  
- 2) \_\_\_\_\_ is the flying mammals.
 

a) Blue whale	b) Shrew
c) Bat	d) kangaroo
  
- 3) \_\_\_\_\_ is also known as Lancelet.
 

a) Myxine	b) Amphioxus
c) Petromyzone	d) Herdmania
  
- 4) Animals giving birth to young ones are called \_\_\_\_\_.
 

a) Oviparous	b) Viviparous
c) Coelomate	d) Amphibious
  
- 5) Reptiles are \_\_\_\_\_.
 

a) Warm blooded	b) Cold blooded
c) Hot blooded	d) Thin Blooded
  
- 6) Agnatha includes \_\_\_\_\_.
 

a) Naja naja	b) Jawlessfish
c) Naja hunnah	d) Vipera russelli

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

**06**

- a) Write a note on agnatha.
- b) Give an account on Osteichthyes.
- c) Indirect parental care in Amphibia.
- d) Duckbill platypus.
- e) General character of phylum protochordata.

- Q.3 Answer the following. (Any Two) 06**
- a) Write general features of the class Aves.
  - b) Distinguishing characters of venomous and non-venomous snake.
  - c) Describe the general features of Pisces.
- Q.4 Answer the following (Any Two) 06**
- a) Explain types of snake venom add a note on first aid treatment.
  - b) Economic importance of fishes.
  - c) Describe the general characteristic of mammals.
- Q.5 Answer the following (Any One) 06**
- a) Describe the various kinds of anatomical flight adaptation in the birds.
  - b) Describe the general features and classification of reptiles with examples.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November - 2025  
Environmental Science - II  
Environmental Physics and Chemistry (G04-0212)**

Day & Date: Saturday, 15-11-2025  
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 of the following is a characteristic of acids?
  - a) Turn blue litmus paper red
  - b) Turn red litmus paper blue
  - c) Taste bitter
  - d) Feel slippery
- 2) Which gas makes up the largest percentage of the Earth's atmosphere?
  - a) Oxygen
  - b) Nitrogen
  - c) Argon
  - d) Carbon Dioxide
- 3) What is the SI unit of force?
  - a) Watt
  - b) Joule
  - c) Newton
  - d) Pascal
- 4) Which color of light has the shortest wavelength?
  - a) Red
  - b) Blue
  - c) Yellow
  - d) Green
- 5) What is the primary role of organic matter in soil?
  - a) Providing water
  - b) Retaining nutrients and improving structure
  - c) Increasing soil temperature
  - d) Reducing soil pH
- 6) When water is added to quick lime the reaction is
  - a) Explosive
  - b) endothermic
  - c) exothermic
  - d) photochemical

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

- a) How are free radicals typically formed in the atmosphere?
- b) Define alkalinity of water.
- c) Define reflection of light.
- d) Write note on concept of absorption.
- e) Write Importance of phosphorus in soil.

- Q.3 Answer the following. (Any Two) 06**
- a) Define and explain black body radiation.
  - b) Explain concept of heat transfer.
  - c) Write types of chemical bonds.
- Q.4 Answer the following (Any Two) 06**
- a) Write types of smog.
  - b) Write chemistry of acid rain.
  - c) Write note on heavy metals in water.
- Q.5 Answer the following (Any One) 06**
- a) Write note on ozone layer depletion.
  - b) Explain laws of thermodynamics.

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Set **P**

**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November - 2025  
Geology - II  
Mineralogy (G04-0209)**

Day & Date: Monday, 17-11-2025  
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 Choose the correct alternatives from the options.****06**

- 1) Which of the following mineral is isotropic?
  - a) Garnet
  - b) Calcite
  - c) Phlogopite
  - d) none of these
- 2) Uppper nicol prism is called as \_\_\_\_\_.
  - a) polarizer
  - b) analyzer
  - c) condenser
  - d) pillar
- 3) Feldspar shows \_\_\_\_\_ sets of cleavages.
  - a) I
  - b) II
  - c) III
  - d) none
- 4) \_\_\_\_\_ mineral belongs to the pyroxene group.
  - a) Augite
  - b) Plagioclase
  - c) Biotite
  - d) All of these
- 5) Cleavages in calcite is \_\_\_\_\_ set.
  - a) 1
  - b) 3
  - c) 2
  - d) 8
- 6) Talc mineral having \_\_\_\_\_ hardness.
  - a) 10
  - b) 7
  - c) 1
  - d) 6

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

- a) Name Amphibole group of minerals.
- b) Give the physical properties of quartz mineral.
- c) Name the parts of lower 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 muscovite and biotite.
  - c) Explain relief of minerals.
- Q.4 Answer the following (Any Two) 06**
- a) Describe the luster and cleavages of mineral in physical properties of minerals.
  - b) Describe is extention of minerals.
  - c) Describe isotropism and Anisotropism in minerals.
- Q.5 Answer the following (Any One) 06**
- a) Describe the upper assembly of polarizing microscope.
  - b) Describe optical properties form, twinkling and twining of minerals.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November - 2025  
Computer Science - II  
Operating System Fundamentals (G04-0208)**

Day & Date: Monday, 17-11-2025  
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) Interval between the time of submission and completion of the job is called \_\_\_\_\_.
  - a) Waiting time
  - b) turn-around time
  - c) Throughput
  - d) response time
- 2) Process is called as a \_\_\_\_ entity.
  - a) Active
  - b) passive
  - c) non active
  - d) none of these
- 3) \_\_\_\_ is a technique of temporarily removing inactive programs from the memory of computer system.
  - a) Semaphore
  - b) Spooling
  - c) Swapping
  - d) Scheduler
- 4) The priority scheduling algorithm suffers by \_\_\_\_\_.
  - a) Starvation
  - b) Aging
  - c) Deadlock
  - d) All of these
- 5) The banker's algorithm is used for deadlock \_\_\_\_\_.
  - a) Prevention
  - b) Avoidance
  - c) Detection
  - d) Recovery
- 6) \_\_\_\_ Memory allocation scheme suffers from external fragmentation.
  - a) Paging
  - b) Pure demand paging
  - c) Swapping
  - d) Segmentation

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

- a) What Multiprogramming Operating System.
- b) What is Process?
- c) Define the term Process Scheduling.
- d) Define term Demand paging.
- e) What is fragmentation?

- Q.3 Answer the following. (Any Two) 06**
- a) What is Operating System? Explain Different System Component?
  - b) Explain Process states With Block Diagram.
  - c) Explain FCFS Disk Scheduling Algorithms.
- Q.4 Answer the following (Any Two) 06**
- a) What is Deadlock? Explain different Characteristics of Deadlock?
  - b) What is paging? Explain Paging with Advantages and Disadvantages?
  - c) Explain Round Robin scheduling algorithms with example.
- Q.5 Answer the following (Any One) 06**
- a) Explain the different Services provided by Operating System?
  - b) Explain the Banker's algorithm for deadlock avoidance.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November – 2025  
Geography II  
Geomorphology - II (G04-0207)**

Day & Date: Tuesday, 18-11-2025  
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 concept of Geographical cycle of erosion was given by \_\_\_\_\_.  
 a) King    b) W.M. Davis  
 c) Walther Penck                                      d) Dutton
  
- 2) Rocks formed due to alteration of original structure due to heat and excessive pressure are called \_\_\_\_\_.  
 a) Sedimentary rocks                                  b) Igneous rocks  
 c) Metamorphic rocks                                d) None of these.
  
- 3) The process by which masses of rock and soil move downhill under the influence of gravity is called \_\_\_\_\_.  
 a) Landsliding    b) Mass wasting  
 c) Hydraulic action                                        d) Solifluction
  
- 4) \_\_\_\_\_ are formed in the upper course of river.  
 a) Waterfalls    b) Oxbow lake  
 c) Delta    d) Natural levee
  
- 5) \_\_\_\_\_ landforms are not associated with glacier.  
 a) U shaped valley    b) Hanging valley  
 c) Crag and Tail    d) Pot Holes
  
- 6) Wave cut platforms is created by \_\_\_\_\_ works of ocean waves.  
 a) Erosional    b) Depositional  
 c) Both a and b    d) None of these

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

**06**

- a) Describe the characteristics of sedimentary rocks.
- b) State the types of Biotic weathering.
- c) State the name of aeolian erosional land Forms.
- d) Explain the lagoons land Feature.
- e) Describe the importance of metamorphic rocks.

- Q.3 Answer the following. (Any Two) 06**
- a) Describe the chemical weathering.
  - b) Describe the Delta.
  - c) Explain the 'U' shaped valley.
- Q.4 Answer the following (Any Two) 06**
- a) State the concept of mass wasting in briefly.
  - b) Describe the Ingenious Rocks.
  - c) Describe the Barkhan.
- Q.5 Answer the following (Any One) 06**
- a) Describe the Erosional work of River.
  - b) Describe the concept of cycle of erosion.

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**B.Sc. (Plain) (Semester - II) (New) (NEP CBCS) Examination:  
October/November – 2025  
Electronics – II  
Basic Circuit Theory and Network Analysis (G04-0205)**

Day & Date: Wednesday, 19-11-2025  
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 alternatives from the options. 06**

- 1) The working principle of a transformer is based on \_\_\_\_\_.
  - a) self-induction
  - b) mutual induction
  - c) opposition
  - d) conduction
- 2) The unit of inductance is \_\_\_\_\_.
  - a) Farad
  - b) Ampere
  - c) Henry
  - d) Ohms
- 3) The internal resistance of the practical voltage source is \_\_\_\_\_.
  - a) finite
  - b) zero
  - c) infinite
  - d) all of these
- 4) A sinusoidal signal has frequency of 50 Hz then its time period is \_\_\_\_\_.
  - a) 2 m sec
  - b) 200 m sec
  - c) 200 sec
  - d) 20 m sec
- 5) The Z parameters are same as \_\_\_\_\_ circuit parameters.
  - a) short
  - b) hybrid
  - c) open
  - d) all of these
- 6) In pure resistive 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) Draw the symbol of fixed and variable capacitor.
- c) Define impedance. State its unit.
- d) State maximum power transfer theorem.
- e) State any four application of relay.

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

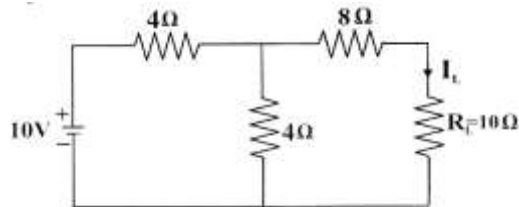
- a) State Kirchoff's voltage and current law.
- b) A series resonance circuit has bandwidth of 32 MHz and quality factor of 5. Calculate resonating frequency.
- c) Define active and passive components with their examples.

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

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

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

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



- b) 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:  
October/November – 2025**

**Physics**

**Need of Electricity in Daily Life (G04-GE-OE-301)**

Day & Date: Tuesday, 28-10-2025  
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 allowed.

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

- 1) \_\_\_\_\_ is a non-renewable source of energy.
  - a) Solar
  - b) Wind
  - c) Natural Gas
  - d) Biomass
- 2) The main component used in solar panels to generate electricity is \_\_\_\_\_.
  - a) copper
  - b) silicon
  - c) iron
  - d) aluminium
- 3) Energy conservation results in \_\_\_\_\_.
  - a) increased energy bills
  - b) energy waste
  - c) environmental protection
  - d) None of the above
- 4) The power consumption is measured with the help of \_\_\_\_\_.
  - a) thermometer
  - b) stopwatch
  - c) wattmeter
  - d) hygrometer
- 5) A residential energy audit is conducted in \_\_\_\_\_.
  - a) factories
  - b) homes
  - c) offices
  - d) power stations
- 6) \_\_\_\_\_ of the following is not a benefit of conserving electricity.
  - a) Lower bills
  - b) Energy efficiency
  - c) More pollution
  - d) Resource saving

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

- a) Define electricity and state two of its daily uses.
- b) List any two renewable sources of electricity.
- c) Mention any two disadvantages of using fossil fuels for electricity.
- d) Write any two benefits of using solar energy.
- e) Name two instruments used in an energy audit and their function.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the general process of electricity generation and transmission.
  - b) What are the major types of electricity production? Mention one advantage of each.
  - c) Write a short note on misuse of electricity with two examples.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain three key challenges in saving electricity in modern homes.
  - b) Describe three benefits of electricity conservation.
  - c) What are the types of energy audits? Briefly explain each.
- Q.5 Answer the following. (Any One) 06**
- a) What is an energy audit? Explain its importance, types, and steps involved in conducting it.
  - b) Explain the difference between conventional and non-conventional sources of energy. Describe their role in sustainable development.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Chemistry  
Chemistry for Competitive Examination - I (G04-GE-OE-302)**

Day & Date: Tuesday, 28-10-2025  
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 diagrams wherever necessary.  
4) Use of log table and calculators is allowed.

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

- 1) Which of the following atomic models introduced the concept of a nucleus at the centre of the atom?
  - a) Dalton's Atomic Model
  - b) Thomson's Atomic Model
  - c) Rutherford's Nuclear Model
  - d) Bohr's Atomic Model
- 2) The change of state from liquid to gas is called \_\_\_\_\_.
  - a) Melting
  - b) Freezing
  - c) Vaporization
  - d) Sublimation
- 3) A double bond consists of \_\_\_\_\_.
  - a) Two sigma bonds
  - b) One sigma and one pi bond
  - c) Two pi bonds
  - d) One sigma and two pi bonds
- 4) Which is not an allotrope of carbon?
  - a) Diamond
  - b) Graphite
  - c) Buckminsterfullerene
  - d) Quartz
- 5) Which of the following pairs are isotopes?
  - a)  $^{12}\text{C}$  and  $^{14}\text{C}$
  - b)  $^{16}\text{O}$  and  $^{16}\text{N}$
  - c)  $^2\text{H}$  and  $^3\text{He}$
  - d)  $^{40}\text{Ca}$  and  $^{40}\text{Ar}$
- 6) Carbon monoxide is dangerous because \_\_\_\_\_.
  - a) it is a greenhouse gas
  - b) it forms acid rain
  - c) it binds with haemoglobin
  - d) it causes ozone depletion

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

- a) What is an atom?
- b) Define Pressure and volume.
- c) What is Valency?
- d) Define Covalent and ionic Bond.
- e) What is Allotropy? Give Two Names.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain Thomson's Atomic Model of the atom.
  - b) Give three characteristics each of solids, liquids, and gases.
  - c) What is a coordinate bond? How is it different from a covalent bond? Explain with an example.
- Q.4 Answer the following. (Any Two) 06**
- a) What is critical temperature? Why is it important for liquefying gases?
  - b) What is polarity in covalent bonds? Explain the concept using HCl and O<sub>2</sub> molecules.
  - c) What are functional groups? How do they affect the properties of organic compounds?
- Q.5 Answer the following. (Any One) 06**
- a) Write a detailed note on the allotropes of carbon. Compare crystalline and amorphous forms with examples.
  - b) Describe Rutherford's Nuclear Model of the Atom.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
GEOLOGY  
Geomorphology (G04-GE-OE-309)**

Day & Date: Tuesday, 28-10-2025  
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 Multiple Choice Question: (MCQ) 06**

- 1) The concept of peneplain was introduced by \_\_\_\_\_.  
a) W. M. Davis    b) H. Hutton  
c) J. T. Hack     d) A. Holmes
  
- 2) Which type of drainage pattern develops on a volcanic cone?  
a) Dendritic     b) Radial  
c) Trellis    d) Rectangular
  
- 3) The term "yardang" refers to \_\_\_\_\_.  
a) A river meander                                         b) A glacial valley  
c) A wind sculpted ridge                                 d) A marine terrace
  
- 4) Which landform is associated with karst topography?  
a) Cirque     b) Stalactite  
c) Esker    d) Drumlin
  
- 5) The process responsible for meander cut off is \_\_\_\_\_.  
a) Abrasion     b) Deposition  
c) Headward Erosion                                      d) Lateral Erosion
  
- 6) Which coastal landform is produced mainly b wave deposition?  
a) Sea Arch     b) Stack  
c) Spit    d) Cliff

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

- a) What is karst topography?
- b) Define Geomorphology?
- c) What is Rejuvenation?
- d) What are the stages of cycle of river?
- e) State the names of coastal landforms formed by erosional work of sea waves.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Describe types of Moraines.
  - b) Describe Physical Weathering.
  - c) Explain Sea floor Spreading.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Describe the concept of Plate Tectonic Theory.
  - b) Describe Continental Drift Theory.
  - c) Describe the various landform produced by Wind Depositional.
- Q.5 Answer the following question. (Any One) 06**
- a) What is Mass Wasting? Explain the types of Mass Wasting.
  - b) Describe in detail depositional features formed by the work of River.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Botany  
Terrace Garden (G04-GE-OE-303)**

Day & Date: Tuesday, 28-10-2025  
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. (MCQ) 06**

- 1) A natural pesticide for terrace garden is \_\_\_\_\_.
  - a) Malathion
  - b) Neem oil
  - c) DDT
  - d) Carbaryl
  
- 2) Before starting a terrace garden, one must ensure \_\_\_\_\_.
  - a) Heavy weight of soil
  - b) No sunlight exposure
  - c) Roof waterproofing
  - d) Cement plaster removal
  
- 3) Rooftop gardens help in reducing \_\_\_\_\_.
  - a) Groundwater levels
  - b) Air pollution
  - c) House strength
  - d) Urban biodiversity
  
- 4) Terrace gardening promotes \_\_\_\_\_.
  - a) Use of chemical fertilizer
  - b) Concrete expansion
  - c) Organic farming
  - d) Heavy machinery use
  
- 5) Terrace gardening is also known as \_\_\_\_\_.
  - a) Hydroponics
  - b) Rooftop gardening
  - c) Indoor gardening
  - d) Backyard farming
  
- 6) \_\_\_\_\_ is commonly used in lightweight potting mix for terrace gardens.
  - a) Cement
  - b) Cocopeat
  - c) Clay
  - d) Sand only

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

- a) Name any two composting method.
- b) Enlist tool used for terrace garden.
- c) What is the full form of NPK?
- d) Give two example of a leafy vegetable grown on terrace.
- e) What is foliar spray?

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain any five tools or equipment required for terrace gardening.
  - b) Write any four precautions to be taken during terrace gardening.
  - c) Write the difference between organic and chemical fertilizers.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Define vertical gardening. What are its advantages on terraces?
  - b) What is vermicompost ? How is it used in terrace gardening?
  - c) Name any five plants suitable for terrace gardens.
- Q.5 Answer the following question. (Any One) 06**
- a) Discuss pest and disease management in terrace gardening using organic methods.
  - b) Explain the importance of waterproofing and drainage in terrace gardening.



- d) What is wildlife trafficking?
- e) Discuss about forensic laboratories in India.

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

- a) Elaborate the point 'Environmental Crimes'.
- b) Write on chemical evidences in forensic analysis.
- c) Explain digital evidence in forensic investigations.

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

- a) Write on physical evidences in forensic analysis.
- b) Write role of forensic science in investigation of poaching.
- c) Discuss about forensic entomology.

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

- a) Write on DNA profiling in technique and its role in forensic science.
- b) Write on biological evidences in forensic analysis.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
MATHEMATICS  
Boolean Algebra (G04-GE-OE-310)**

Day & Date: Tuesday, 28-10-2025  
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.

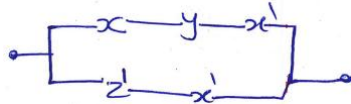
**Q.1 Choose the correct alternative for each of the following.** **06**

- 1) For all  $x, y \in B$  then Absorption Law states that \_\_\_\_\_.
  - a)  $y + x = z + x$  then  $y = z$
  - b)  $x + x = x$
  - c)  $x \cdot 0 = 0$
  - d)  $x(x + y) = x$
  
- 2) Let  $R$  be a relation in  $A$  then  $R$  is called antisymmetric if \_\_\_\_\_.
  - a)  $(x, x) \in R \forall x \in A$
  - b)  $(x, y) \in R \Rightarrow (y, x) \in R$
  - c)  $(x, y) \in R \& (y, x) \in R \Rightarrow x = y$
  - d)  $(x, y) \in R$  and  $(y, z) \in R \Rightarrow (x, z) \in R$
  
- 3) For all  $x, y, z \in B$  then Distribution Law is \_\_\_\_\_.
  - a)  $x + (y \cdot z) = (x + y) \cdot (x + z)$
  - b)  $x \cdot (y + z) = (x \cdot y) + (x \cdot z)$
  - c)  $x + (y + z) = (x + y) \cdot (x + z)$
  - d)  $x \cdot (y + z) = (x + y) \cdot (x + z)$
  
- 4) The output of an AND gate is 1 only when \_\_\_\_\_.
  - a) All inputs are 0
  - b) All inputs are 1
  - c) Any input is 1
  - d) Inputs are different
  
- 5) Which gate is called a universal gate?
  - a) AND
  - b) OR
  - c) NAND
  - d) XOR
  
- 6) Which gate gives the complement of AND operation?
  - a) NOR
  - b) NAND
  - c) XOR
  - d) OR

**Q.2 Attempt any three of the following.** **06**

- a) For all  $x, y, z \in B$  if  $y + x = z + x$  and  $y + x' = z + x'$  then show that  $y = z$
- b) For all  $x, y \in B$  then show that  $x + y = x + (y - x)$
- c) Define sub Algebra.

d) Simplify the switching circuit.



e) Explain NAND gate.

**Q.3 Attempt any two of the following.**

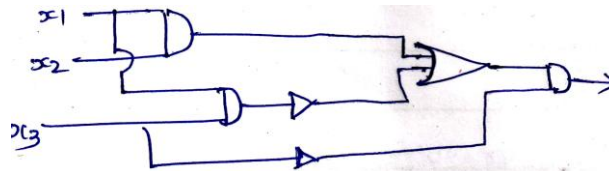
**06**

- a) For all  $x, y \in$  then show that  $(x + y) - (x \cdot y) = x \oplus y$
- b) Construct the truth table for  $E(x, y, z) = xy + x'z$
- c) In Boolean algebra, B show that complement of an element is unique.

**Q.4 Attempt any two of the following.**

**06**

- a) Explain AND Gate.
- b) Write the Boolean expression for



- c) Find all sub algebras of Boolean algebra  $D_{70}$   
Draw diagram of posets  $D_{70}$

**Q.5 Attempt any one of the following.**

**06**

- a) Prove Demorgan's Law
  - i)  $(x + y)' = x' \cdot y'$
  - ii)  $(xy)' = x' + y'$
- b) Reduce the Boolean expression to the sum of products form  
 $E(x, y, z) = (x'y)' (x' + xyz')$

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Statistics  
Probability Theory (G04-GE-OE-311)**

Day & Date: Tuesday, 28-10-2025  
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 from the options.(MCQ)****06**

- 1) Let  $A = \{2,4,6\}$  and  $B = \{3,6\}$  be any two events, then \_\_\_\_\_.  
 a)  $A \cup B = \{2,3,4,6\}$                       b)  $A \cap B = \{6\}$   
 c)  $A \cap B = \phi$                                       d) Both a and b
- 2) A number is selected at random from the set is  $\{1,2,3,4 \dots,50\}$ . What is the probability that selected number contains the digit 5.  
 a)  $\frac{1}{50}$     b)  $\frac{2}{50}$   
 c)  $\frac{5}{50}$     d)  $\frac{6}{50}$
- 3) If  $P(A) = \frac{1}{3}$ ,  $P(B) = \frac{1}{4}$ ,  $P(A/B) = \frac{1}{6}$  then  $P(B/A) =$  \_\_\_\_\_.  
 a)  $\frac{1}{4}$     b)  $\frac{1}{8}$   
 c)  $\frac{3}{4}$     d) None of these
- 4) For two events  $A$  and  $B$ , if  $P(A) = \frac{2}{3}$ ,  $P(B) = \frac{3}{8}$ , and  $P(A \cap B) = \frac{1}{4}$  then  $A$  and  $B$  are \_\_\_\_\_.  
 a) Mutually exclusive but not independent  
 b) Mutually exclusive and independent  
 c) Independent but not mutually exclusive  
 d) Not mutually exclusive not independent
- 5) If  $P(x) = x(2 - x)$  ;  $x = 0,1,2$ . Then  $P(X = 1) =$  \_\_\_\_\_.  
 a) 0    b)  $\frac{1}{2}$   
 c) 1    d) None of these

6) If random variable  $X$  is a number appeared on throw of a fair die then  $E(X) = \underline{\hspace{2cm}}$ .

- a) 3
- b)  $\frac{7}{2}$
- c)  $\frac{1}{6}$
- d) Does not exist

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

**06**

- a) Define Random experiment with suitable example.
- b) Define axiomatic definition of probability.
- c) State multiplication theorem for two events  $A$  and  $B$ .
- d) Define cumulative distribution function of r. v.  $X$ .
- e) Define p.g.f. of r. v.  $X$ .

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

**06**

- a) Let  $A$  and  $B$  are two events such that,  $P(A) = 0.42, P(B) = 0.48$  and  $P(A \cap B) = 0.16$ . Find
  - i)  $P(\text{not } A)$
  - ii)  $P(\text{not } B)$
  - iii)  $P(A \text{ or } B)$
- b) If  $A$  and  $B$  are independent events. Then prove that
  - 1)  $A$  and  $B^c$  are independent
  - 2)  $A^c$  and  $B$  are independent
- c) A r. v.  $X$  has following probability distribution.
 

$X$	:	- 2	- 1	0	1	2	3
$P(x)$	:	0.1	0.1	0.2	0.2	0.3	0.1

 Find  $E(X)$  and  $V(X)$ .

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

**06**

- a) If  $A \subset B$ , then prove that
  - i)  $P(B/A) = 1$
  - ii)  $P(A/B) = \frac{P(A)}{P(B)}$
- b) If  $A, B, C$  forms the partition of the sample space. And  $3P(A) = 2P(B) = 6P(C)$ , then find  $P(A)$ .
- c) If the p.g.f. of  $X$  is given by  $P_x(s) = \frac{3s(s+1)}{10}$  Find mean and variance of  $X$ .

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

**06**

- a) A discrete random variable  $X$  assumes values  $-3, -2, 0, 2$  and  $3$ 
  - $P(X = -3) = P(X = -2)$
  - $P(X = 2) = P(X = 3)$
  - $P(X > 0) = P(X < 0) = P(X = 0)$

Obtain

- i) p.m.f of  $X$
  - ii) The distribution function of  $X$
  - iii) Median of  $X$
- b)** Define conditional probability of an event. Show that conditional probability satisfies all the axioms of unconditional probability.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
COMPUTER SCIENCE  
Software Engineering (G04-GE-OE-308)**

Day & Date: Tuesday, 28-10-2025  
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. (MCQ)****06**

- 1) Which testing is done by end-users?
  - a) Unit Testing
  - b) System Testing
  - c) Integration Testing
  - d) Acceptance Testing
  
- 2) What are the components of a typical software system?
  - a) Only hardware and software
  - b) Software and internet
  - c) Software, hardware, people, procedures, and data
  - d) Source code and compiler only
  
- 3) The primary goal of software engineering is \_\_\_\_\_.
  - a) To create error-free code
  - b) To design software with maximum features
  - c) To build software that is reliable, efficient, and maintainable
  - d) To increase the size of the codebase
  
- 4) What is the main focus of the Spiral Model?
  - a) Documentation
  - b) Risk analysis
  - c) Maintenance
  - d) Prototyping
  
- 5) Which one of these is not a functional requirement?
  - a) User login
  - b) Password reset
  - c) Application response time
  - d) Search functionality
  
- 6) SQA is typically performed \_\_\_\_\_.
  - a) Throughout the SDLC
  - b) Only during testing
  - c) Only after coding
  - d) Only in the design phase

- Q.2 Answer the following questions. (Any Three) 06**
- a) Formulas for effort and cost estimation
  - b) What is unit testing?
  - c) Differentiate between verification and validation.
  - d) Which of the Phases of SDLC?
  - e) Define functional requirement.
- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain the V-Model.
  - b) What is software maintenance? Explain different types.
  - c) What is software quality assurance? Explain its role in the SDLC.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Compare black-box testing and white-box testing with examples.
  - b) Compare and contrast the Waterfall model and the Spiral model.
  - c) What is a Data Dictionary in Software Engineering?
- Q.5 Answer the following question. (Any One) 06**
- a) What is risk management in software engineering? Explain its types.
  - b) List and briefly describe various fact-finding techniques used in system Development.



- Q.3 Answer the following questions. (Any Two) 06**
- a) Differentiate between monocrystalline and poly crystalline solar cells.
  - b) Explain concept of energy storage in PV systems.
  - c) Write note on solar street lighting system.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain the process of sizing battery bank.
  - b) Discuss smart solar systems with examples.
  - c) Explain applications of thin film solar cells.
- Q.5 Answer the following question. (Any One) 06**
- a) Write short note on Maximum Power Point Tracking (MPPT).
  - b) Explain solar energy applications and current trends.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
MICROBIOLOGY  
Microbiology in Agriculture (G04-GE-OE-306)**

Day & Date: Tuesday, 28-10-2025  
Time: 12:00 PM To 01:30 PM

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 full form of VAM?
  - a) Vesicular-arbuscular mycorrhiza
  - b) Venom azolla mycorrhiza
  - c) Venom-arbuscular mycorrhiza
  - d) Vesicular-azollae mycorrhiza
  
- 2) What term describes a pesticide used to kill weeds?
  - a) Insecticide
  - b) Fungicide
  - c) Herbicide
  - d) Molluscicide
  
- 3) Which of the following is a free-living, aerobic, non-photosynthetic nitrogen-fixing bacterium?
  - a) *Rhizobium*
  - b) *Azotobacter*
  - c) *Nostoc*
  - d) *Azospirillum*
  
- 4) *Bacillus thuringiensis* is used as a biopesticide because it produces \_\_\_\_\_.
  - a) Antibiotics to kill bacteria
  - b) Spores that degrade plant matter
  - c) Plant growth-promoting substances
  - d) Insecticidal protein crystals (Bt toxin)
  
- 5) Which of the following is NOT an example of a biofertilizer?
  - a) Blue-Green Algae (BGA)
  - b) Mycorrhiza
  - c) Urea
  - d) Azolla
  
- 6) What is a primary role of mycorrhizal fungi as a biofertilizer?
  - a) Nitrogen fixation in the soil
  - b) Symbiotic association with plant roots to enhance nutrient absorption
  - c) Production of growth hormones for plants
  - d) Decomposing organic matter in the soil

- Q.2 Answer the following questions. (Any Three) 06**
- a) Give two advantages of biofertilizer.
  - b) Define biofertilizer and give examples of it.
  - c) Enlist four nitrogen fixing organism.
  - d) Define pesticide and enlist its types.
  - e) What is organic matter decomposer?
- Q.3 Answer the following questions. (Any Two) 06**
- a) Write a short note on chemical fertilizers and their impact on the environment.
  - b) Explain harmful effect of pesticides.
  - c) Explain mass production of phosphate solubilizers and phosphate absorbers.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain biomass production of azotobacter.
  - b) Write a short note on useful microbes as biopesticides with examples.
  - c) Differentiate chemical fertilizer and biofertilizer.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain types of biofertilizer.
  - b) Describe in detail biomass production and formulation of *Bacillus thuringiensis*.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
GEOGRAPHY  
Tourism Geography (G04-GE-OE-307)**

Day & Date: Tuesday, 28-10-2025  
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 diagrams & give equations wherever necessary.  
4) Use of maps stencil is allowed.

**Q.1 Fill in the blanks by choosing correct alternatives given below. 06**

- 1) Words related to tourism geography, such as "tour" and "tourism", are derived from the \_\_\_\_\_ word tornare and the Ancient \_\_\_\_\_ word tornos.
  - a) Latin & Greek
  - b) Roman & Greek
  - c) Latin & Roman
  - d) Indian & Greek
- 2) Tourism geography is the branch of \_\_\_\_\_ Geography.
  - a) Climatology
  - b) Human
  - c) Geomorphology
  - d) Oceanography
- 3) \_\_\_\_\_ is defined as "responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education".
  - a) Ecosystem
  - b) Ecology
  - c) Tourism
  - d) Ecotourism
- 4) \_\_\_\_\_ tourism is a form of travel to sacred sites, driven by religious beliefs and the desire for spiritual growth, blessings, or reflection.
  - a) Pilgrimage
  - b) Cultural
  - c) Medical
  - d) Natural
- 5) \_\_\_\_\_ recorded the highest number of domestic tourists visits in India.
  - a) Maharashtra
  - b) Kolkata
  - c) Uttar Pradesh
  - d) Goa
- 6) India's tourism sector contributed approximately \_\_\_\_\_% to the Gross Domestic Product (GDP) in the financial year 2023-24.
  - a) 5
  - b) 10
  - c) 15
  - d) 20

- Q.2 Answer the following questions. (Any Three) 06**
- a) Define the tourism geography.
  - b) Which is the tourism capital of Maharashtra?
  - c) Which is the first tourist district in Maharashtra?
  - d) What is the meaning of tourism circuit?
  - e) Define the medical tourism.
- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain the top five tour agencies in India.
  - b) Cultural Tourism
  - c) Concept of marketing in tourism
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain the components of tourism.
  - b) What are the steps in the tourism planning process?
  - c) Explain the concept of Ecotourism.
- Q.5 Answer the following question. (Any One) 06**
- a) Define the tourism geography & explain its nature and scope.
  - b) Explain the significance of tourism & explain it's impact of tourism in India.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
ENVIRONMENTAL SCIENCE  
Life and Its Environment (G04-GE-OE-312)**

Day & Date: Tuesday, 28-10-2025  
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) Fungi are placed in a separate kingdom because they are \_\_\_\_\_.
  - a) Prokaryotic
  - b) Heterotrophic absorbers
  - c) Photosynthetic
  - d) Autotrophic
- 2) Bacteria are \_\_\_\_\_.
  - a) Eukaryotic
  - b) Prokaryotic
  - c) Multicellular
  - d) Without cell wall
- 3) Nitrogen-fixing bacteria help in \_\_\_\_\_.
  - a) Carbon fixation
  - b) Protein synthesis
  - c) Converting nitrogen gas into ammonia
  - d) Decomposition
- 4) Algae are primarily \_\_\_\_\_.
  - a) Heterotrophic
  - b) Autotrophic
  - c) Saprophytic
  - d) Parasitic
- 5) ATP is called the \_\_\_\_\_.
  - a) Energy carrier
  - b) Structural protein
  - c) Genetic material
  - d) Enzyme
- 6) Ribosomes are responsible for \_\_\_\_\_.
  - a) Energy production
  - b) Protein synthesis
  - c) Digestion
  - d) Genetic control

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

- a) Who disproved the theory of spontaneous generation?
- b) State Whittaker's five kingdoms.
- c) What are bacteria?
- d) When did dinosaurs become extinct?
- e) What is the function of mitochondria?

- Q.3 Answer the following questions. (Any Two) 06**
- a) What are the beneficial and harmful activities of bacteria?
  - b) What are viruses? Describe their structure.
  - c) Explain ATP generation in cells.
- Q.4 Answer the following questions. (Any Two) 06**
- a) What are the factors affecting enzyme activity?
  - b) Differentiate between mitosis and meiosis.
  - c) What are phytohormones? Mention their types.
- Q.5 Answer the following questions. (Any One) 06**
- a) Describe the structure and function of cell organelles - nucleus, mitochondria, chloroplast, and endoplasmic reticulum.
  - b) Write a detailed note on the classification and life cycles of bryophytes, gymnosperms, and angiosperms.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Plant Protection  
Terrace Garden (G04-GE-OE-313)**

Day & Date: Tuesday, 28-10-2025  
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 questions carry equal marks.

**Q.1 Multiple Choice Question: (MCQ) 06**

- 1) The process of converting organic waste into manure is called \_\_\_\_\_.  
a) Pest management                      b) Composting  
c) Irrigation                                d) Hydroponics
- 2) Which natural factor is most important for photosynthesis?  
a) Light                                        b) Shade  
c) Cement                                    d) Plastic
- 3) Raised bed technique is a \_\_\_\_\_.  
a) Method of terrace gardening  
b) Composting method  
c) Fertilizer application  
d) Pest control technique
- 4) Which fertilizer releases nutrients slowly over time?  
a) Chemical urea                          b) Bio fertilizer  
c) Ammonium nitrate                      d) None of the above
- 5) Yellowing of leaves is often a symptom of \_\_\_\_\_.  
a) Nutrient deficiency                      b) Pest attack  
c) Overwatering                              d) All of the above
- 6) Which tool is essential for loosening soil in terrace gardens?  
a) Hoe    b) Screwdriver  
c) Hammer                                    d) Knife

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

- a) Define natural parameters.
- b) List two advantages of terrace gardening.
- c) Mention any two pest control methods.
- d) Give two examples of organic fertilizers.
- e) State any two benefits of composting.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain any two types of terrace gardening.
  - b) Discuss importance of water management in terrace gardening.
  - c) Describe role of organic garden soil in plant growth.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain natural parameters affecting terrace gardening.
  - b) Describe process of vermicomposting.
  - c) Explain organic and inorganic fertilizers with examples.
- Q.5 Answer the following question. (Any One) 06**
- a) Describe methods of terrace gardening in detail.
  - b) Discuss integrated pest and disease management in terrace gardens.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
ENGLISH  
Reading Texts in Indian English - I (G04-ENG-301)**

Day & Date: Wednesday, 29-10-2025  
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) Multiple choice questions.****06**

- 1) "The Ghagra in Spate" is poem written by \_\_\_\_\_.  
a) Keki N. Daruwalla                      b) R. Parthasarathy  
c) Shiv K. Kumar                              d) Toru Dutt
- 2) According to Gieve Patel the Process of Killing a Tree is \_\_\_\_\_.  
a) Not simple                                      b) Not difficult  
c) Easy    d) None of these
- 3) The poem 'A Goodbye Party for Miss Pushpa T.S' is a \_\_\_\_\_ by Nissim Ezeikel.  
a) love poem                                      b) spiritual poem  
b) satirical poem                                      d) religious poem
- 4) Who is the author of the short story "The Doctor's Word"?  
a) Ruskin Bond                                      b) Mulk Raj Anand  
c) R. K. Narayan                                      d) Khushwant Singh
- 5) What happens to the child at the fair?  
a) He falls sick                                      b) He gets lost in the crowd  
c) He meets a friend                                      d) He finds money
- 6) Who becomes the narrator's first friend in the story 'The Old Banyan Tree'?  
a) A parrot    b) A red squirrel  
c) A small grey squirrel                                      d) A monkey

**Q.2 Write short answers. (Any Two)****06**

- a) What is the occasion in the poem 'A Goodbye Party for Miss Pushpa T.S'?
- b) What ironic or satirical element does Daruwalla include?
- c) Where is the banyan tree located in the story?
- d) Who is Dr. Raman?

- Q.3 Write short answers. (Any One) 06**
- a) What is the main theme of the poem “On Killing a Tree”?
  - b) What philosophical conclusion does the poet Shiv Kumar reach about the need for pilgrimage?
- Q.4 Write the detail answer. (Any One) 12**
- a) Describe the character of Dr. Raman in the R.K. Narayan’s story 'The Doctor's World'.
  - b) Describe the main theme of the short story 'The Lost Child' by Mulk Raj Anand in detail.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
PHYSICS - III  
General Physics (G04-DSC1-0301)**

Day & Date: Thursday, 30-10-2025  
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

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

**Q.1 Choose the correct alternative.**

**06**

- 1) The box product  $[\vec{A} \ \vec{B} \ \vec{C}]$  of three vectors is \_\_\_\_\_ quantity.
  - a) constant
  - b) zero
  - c) scalar
  - d) vector
- 2) If  $\vec{A} \cdot (\vec{B} \times \vec{C}) = 0$  then vectors  $\vec{A}$ ,  $\vec{B}$ , and  $\vec{C}$  are \_\_\_\_\_.
  - a) equal
  - b) zero
  - c) non-coplanar
  - d) coplanar
- 3) The relation between precessional torque and rate of precession is \_\_\_\_\_.
  - a)  $\phi = \frac{\tau_1}{I}$
  - b)  $\phi = \frac{\tau_1}{\omega}$
  - c)  $\phi = \frac{\tau_1}{I\omega}$
  - d)  $\phi = I\omega$
- 4) The rise and fall of axis of rotating body is called \_\_\_\_\_.
  - a) precession
  - b) nutation
  - c) rotation
  - d) simple harmonic motion
- 5) In a bent beam the filament which is neither elongated nor compressed is called \_\_\_\_\_.
  - a) plane of bending
  - b) cantilever
  - c) neutral surface
  - d) bending moment
- 6) If the height of the liquid in a rotation viscometer is increased, the rotational torque will \_\_\_\_\_.
  - a) increases
  - b) remains constant
  - c) decreases
  - d) vanishes

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

**06**

- a) State Del operator.
- b) State Lanchster's rule.
- c) Give any two applications of gyroscopic motion.
- d) Define plane of bending and neutral axis.
- e) Define coefficient of viscosity.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain scalar and vector fields with examples.
  - b) Write note on gyroscope.
  - c) Derive an expression for depression of centrally loaded beam.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Write note on divergence of vector field.
  - b) Draw neat labelled diagram of Searle's viscometer.
  - c) Write note on bending moment.
- Q.5 Answer the following question. (Any One) 06**
- a) Describe the construction and working of Ostwald viscometer.
  - b) Describe Searles method to determine Youngs modulus and modulus of rigidity of material of wire.

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Set P

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025**

**CHEMISTRY - III**

**Organic Chemistry (G04-DSC1-0303)/(G04-DSC1-0325)/(G04-DSC1-0327)**

Day & Date: Thursday, 30-10-2025  
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

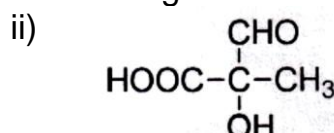
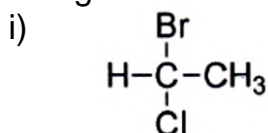
**Instructions:** 1) All questions are compulsory.  
2) Figures to the right indicate full marks.

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

- 1) UV spectroscopy is mainly used for the determination of \_\_\_\_\_.
  - a) conjugation
  - b) functional group
  - c) molecular weight
  - d) molecular formula
  
- 2) E and Z nomenclature is used for determination of configuration \_\_\_\_\_.
  - a) optical isomers
  - b) geometrical isomers
  - c) conformational isomers
  - d) None of these
  
- 3) In Beckmann transformation the product obtained is \_\_\_\_\_.
  - a) oxime
  - b) N-substituted amide
  - c) conformational isomers
  - d) None of these
  
- 4) IUPAC name of  $\text{CH}_3-\underset{\text{CH}_3}{\text{CH}}-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_3$  is \_\_\_\_\_.
  - a) 3-methyl pentanone
  - b) 3-ethyl pentanone
  - c) 2-methyl butan-3-one
  - d) 3-methyl butan-2-one
  
- 5) In aldehydes, carbon of -CHO group is \_\_\_\_\_ hybridized.
  - a)  $sp$
  - b)  $sp^3$
  - c)  $sp^2$
  - d)  $sp^3d^3$
  
- 6) Among the following, which is unsaturated acid \_\_\_\_\_.
  - a) Acrylic acid
  - b) Citric acid
  - c) Phthalic acid
  - d) Chloroacetic acid

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

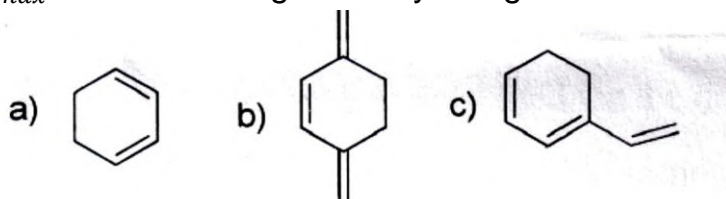
- a) Explain the term chromophore. Give one example.
- b) Assign R and S configuration to the following.



- c) Why benzaldehyde does not undergo aldol condensation reaction?
- d) Define dicarboxylic acid. Give one example.

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

a) Calculate  $\lambda_{max}$  of the following diene by using Woodward-Fieser rule.



- b) Discuss the general mechanism of nucleophilic addition reaction of carbonyl group.  
 c) How will you synthesize Citric acid from glycerol.

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

a) Explain Knoevenagel reaction.

b) What happens when?

- i) Monochloroacetic acid is reacted with KCN
- ii) Acrylic acid is reacted with Na/C<sub>2</sub>H<sub>5</sub>OH
- iii) Succinic acid is reacted with C<sub>2</sub>H<sub>5</sub>OH/HCl

c) How will you synthesize Phthalic acid from O-Xylene and Naphthalene?  
 What happens when phthalic acid is reacted with soda lime.

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

a) Explain types of electronic transitions with examples.

b) Write note on conformational analysis of ethane. Draw energy profile diagram.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025  
BOTANY - III  
Plant Anatomy (G04-DSC1-0305)**

Day & Date: Thursday, 30-10-2025  
Time: 12:00 PM To 01:30 PM

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 Multiple Choice Question:****06**

- 1) Collenchyma is a \_\_\_\_\_ tissue.
  - a) Meristematic
  - b) Simple living
  - c) Simple dead
  - d) Complex
- 2) \_\_\_\_\_ are lignified simple cells.
  - a) Tracheids
  - b) Collenchyma
  - c) Sclereids
  - d) Vessels
- 3) The scattered vascular bundles are found in the stem of \_\_\_\_\_.
  - a) *Nerium*
  - b) Sunflower
  - c) Maize
  - d) Hibiscus
- 4) Nonporous and soft wood is found in \_\_\_\_\_.
  - a) Gymnosperms
  - b) Dicots
  - c) Monocots
  - d) Ferns
- 5) Thick cuticle found in \_\_\_\_\_ plants.
  - a) Hydrophytic
  - b) Mesophytic
  - c) Xerophytic
  - d) Epiphytic
- 6) In square stem the mechanical tissues are present at \_\_\_\_\_.
  - a) Center
  - b) Corners
  - c) Lateral side
  - d) Apex

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

- a) Enlist the elements of phloem tissue.
- b) Mention the types of meristems based on functions.
- c) What is meant by permanent tissue?
- d) What is meant by anomalous secondary growth?
- e) Define meristem.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Classification of meristem based on position.
  - b) Give functions of permanent tissues.
  - c) Describe the activity of vascular cambium.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Write internal structure of dicotyledon root.
  - b) Describe the types of dicotyledon stomata.
  - c) Describe the distribution of mechanical tissues in different plant organs.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain the structure of xylem tissue with neat, labelled diagrams.
  - b) Describe anomalous secondary growth in *Dracaena* stem.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025  
ZOOLOGY – III  
Cell Biology (G04-DSC1-0307)**

Day & Date: Thursday, 30-10-2025  
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) \_\_\_\_\_ is a characteristic of Prokaryotic cell.
  - a) Presence of true nucleus
  - b) Presence of membrane bound organelles
  - c) Lack of true nucleus
  - d) Presence of mitochondria
  
- 2) \_\_\_\_\_ is the primary function of mitochondria in a cell.
  - a) Protein synthesis
  - b) DNA replication
  - c) Energy production
  - d) Cell division
  
- 3) \_\_\_\_\_ is the characteristic features of the rough endoplasmic reticulum.
  - a) Presence of ribosome
  - b) Absence of ribosome
  - c) High lipid content
  - d) Roll in cell signaling
  
- 4) \_\_\_\_\_ is the role of microtubules in the cell.
  - a) Providing mechanical support
  - b) DNA synthesis
  - c) Protein synthesis
  - d) Gene expression
  
- 5) During \_\_\_\_\_ stage of mitosis do the chromosomes line up at the center of cell.
  - a) prophase
  - b) metaphase
  - c) anaphase
  - d) telophase
  
- 6) \_\_\_\_\_ is the thread like structure made of DNA that are found in nucleus.
  - a) Ribosome
  - b) Chromosome
  - c) Mitochondria
  - d) Lysosomes

- Q.2 Answer the following questions. (Any Three) 06**
- a) Lysosome
  - b) Define cell cycle
  - c) Write function of cytoskeleton
  - d) Nuclear envelope
  - e) Passive transport
- Q.3 Answer the following questions. (Any Two) 06**
- a) What is meiosis and what are its significance?
  - b) What is nucleus and what are its structure and function?
  - c) Explain Golgi apparatus
- Q.4 Answer the following questions. (Any Two) 06**
- a) Describe fluid mosaic model of plasma membrane.
  - b) Describe ultrastructure of mitochondria.
  - c) Describe the role of endoplasmic reticulum in the cell.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain types of chromosomes and its function.
  - b) Describe structure and function of eukaryotic cell.



- 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 1111.
  - b) With suitable diagram explain in brief action of T flip-flop.
  - c) What is counter? Define asynchronous and synchronous counter.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain in brief 3:8-line decoder using gates.
  - 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) Explain in brief RS flip-flop using NOR gates.



- Q.3 Answer the following. (Any Two) 06**
- a) Describe secondary structure of proteins with diagrams.
  - b) Write in short Effect, of temperature on bacterial growth.
  - c) Write in short Lock and Key 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 heavy metals 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:  
October/November - 2025  
GEOGRAPHY – III  
Climatology - I (G04-DSC1-0313)**

Day & Date: Thursday, 30-10-2025  
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 alternative.**

**06**

- 1) \_\_\_\_\_ is the lowest layer of the atmosphere.
  - a) Stratosphere
  - b) Exosphere
  - c) Hydrosphere
  - d) Troposphere
  
- 2) \_\_\_\_\_ is an element of weather.
  - a) Humidity
  - b) Loo
  - c) Cyclone
  - d) Tornado
  
- 3) Ozone is concentrated in \_\_\_\_\_ atmospheric layer.
  - a) Stratosphere
  - b) Exosphere
  - c) Hydrosphere
  - d) Troposphere
  
- 4) The average albedo of the earth is \_\_\_\_\_%.
  - a) 15
  - b) 25
  - c) 35
  - d) 45
  
- 5) The lines joining the places of equal \_\_\_\_\_ are called as isotherms.
  - a) Pressure
  - b) Rainfall
  - c) Humidity
  - d) Temperature
  
- 6) \_\_\_\_\_ gas is found in highest quantity in the atmosphere.
  - a) Helium
  - b) Hydrogen
  - c) Oxygen
  - d) Nitrogen

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

**06**

- a) Define the concept of normal laps rate.
- b) Define the concept of Climate.
- c) Define the weather.
- d) Define the temperature inversion.
- e) Define the concept of Insolation.

- Q.3 Answer the following. (Any Two) 06**
- a) Element of Climate.
  - b) Importance of Climatology.
  - c) Explain the 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 heat budget.
- Q.5 Answer the following (Any One) 06**
- a) Explain the structure of the atmosphere.
  - b) Explain the nature of Climatology.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
COMPUTER SCIENCE - III**

**Introduction to Data Structures and Applications (G04-DSC1-0315)**

Day & Date: Thursday, 30-10-2025  
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) A data structure in which elements can be inserted or deleted at/from both the ends but not in the middle is?
  - a) Queue
  - b) Circular queue
  - c) Dequeue
  - d) Priority queue
- 2) The postfix form of  $A*B+C/D$  is?
  - a)  $*AB/CD+$
  - b)  $AB*CD/+$
  - c)  $A*BC+/D$
  - d)  $ABCD+/*$
- 3) The number of edges from the root to the node is called \_\_\_\_\_ of the tree.
  - a) Height
  - b) Depth
  - c) Length
  - d) Width
- 4) How many pointers are necessarily changed for the insertion in a Linked List?
  - a) One
  - b) Two
  - c) Three
  - d) Five
- 5) Circular Queue is also known as \_\_\_\_\_.
  - a) Ring Buffer
  - b) Square Buffer
  - c) Rectangle Buffer
  - d) Curve Buffer
- 6) Process of removing an element from stack is called \_\_\_\_\_.
  - a) Create
  - b) Push
  - c) Evaluation
  - d) Pop

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

- a) Define Data structure.
- b) What is stack?
- c) What is Graph?
- d) Draw a binary tree for e.g. 23,12,82,15,10,57,70.
- e) Define a priority Queue.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain Bubble Sort.
  - b) Difference between Stack and Queue.
  - c) What is searching? Explain types of searching.
- Q.4 Answer the following. (Any Two) 06**
- a) What are different operations available in Stack Data Structure?
  - b) Explain Binary Search Tree.
  - c) Explain Graph Traversal BFS and DFS.
- Q.5 Answer the following. (Any One) 06**
- a) Explain Tree traversal In-order, Pre-order & post-order with example.
  - b) Write a program to implement linked list.



- Q.3 Answer the following. (Any Two) 06**
- a) Describe the classification of igneous rock based on silica saturation.
  - b) Describe Volcanic igneous rock.
  - c) Describe the glass and crystal.
- Q.4 Answer the following (Any Two) 06**
- a) Describe the plutonic igneous rock.
  - b) Describe the continuous Bowens reaction series.
  - c) Describe the glassy and granitic textures.
- Q.5 Answer the following (Any One) 06**
- a) Describe structures of igneous rock.
  - b) What is differentiation? Describe any two-differentiation process.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
MATHEMATICS - III  
Differential Calculus (G04-DSC1-0319)**

Day & Date: Thursday, 30-10-2025  
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) Radius of curvature at any point on the curve  $S = 4a \sin \Psi$  at  $\Psi = 0$  is \_\_\_\_\_.
  - a)  $4a \cos \Psi$
  - b)  $4a \sin \Psi$
  - c)  $4a$
  - d) 0
  
- 2) The pedal formula for the radius of curvature is \_\_\_\_\_.
  - a)  $\rho = r + \frac{dr}{dp}$
  - b)  $\rho = r + \frac{dp}{dr}$
  - c)  $\rho = r \frac{dp}{dr}$
  - d)  $\rho = r \frac{dr}{dp}$
  
- 3) If  $u, v$  are function of  $x, y$  then Jacobian of  $u, v$  with respect to  $x, y$  is a determinant of order \_\_\_\_\_.
  - a) 2
  - b) 3
  - c) 4
  - d)  $n$
  
- 4) If  $u = x^2, v = y^2$  then  $\frac{\partial(uv)}{\partial(xy)} =$  \_\_\_\_\_.
  - a)  $xy$
  - b)  $4xy$
  - c)  $\frac{1}{xy}$
  - d)  $\frac{1}{4xy}$
  
- 5) The maximum value of  $\sin x + \cos x$  is \_\_\_\_\_.
  - a) 2
  - b)  $\sqrt{2}$
  - c) 1
  - d) 3
  
- 6) The maximum value of  $\left(\frac{1}{x}\right)^{1/x}$  is \_\_\_\_\_.
  - a)  $e$
  - b)  $\frac{1}{e}$
  - c)  $e^{\frac{1}{e}}$
  - d)  $\left(\frac{1}{e}\right)^e$

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

- a) Show that for the catenary  $S = C \tan \Psi$  the radius of curvature at any point is given by  $\rho = c + \frac{S^2}{c}$ .
- b) Find radius of curvature of the parabola  $x = at^2, y = 2at$  at 't'
- c) If  $u = x^2 - y^2, v = xy$  find  $\frac{\partial(uv)}{\partial(xy)}$
- d) Define Jacobian of  $uvw$  with respect to  $x, y, z$ .
- e) Write Lagrange's condition for maximum and minimum value of two variables.

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

- a) If equation of curve is given in  $p$  &  $\Psi$  then show that  $\rho = p + \frac{d^2p}{d\Psi^2}$
- b) If  $u, v, w$  be function of three variables  $x, y, z$   
If  $J$  be the Jacobian of  $u, v, w$  with respect to  $x, y, z$  and  $J'$  be the Jacobian of  $x, y, z$  with respect to  $u, v, w$  then show that  
$$\frac{\partial(u,v,w)}{\partial(x,y,z)} \times \frac{\partial(x,y,z)}{\partial(u,v,w)} = 1$$
- c) Find extreme values of the function.  
 $f(x, y) = x^2 + 2xy + 2y^2 + 2x + y$

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

- a) Find radius of curvature for the curve  $r = a(1 - \cos \theta)$
- b) If  $x = e^u \cos v, y = e^u \sin v$  then show that  $\frac{\partial(xy)}{\partial(uv)} = \frac{1}{e^{2u}}$
- c) Examine the polynomial function given by  
 $10x^6 - 24x^5 + 15x^4 - 40x^3 + 108$  for maximum and minimum values.

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

- a) If  $y = f(x)$  be the equation of curve in Cartesian form then show that  
the radius of curvature  $\rho = \frac{[1+(\frac{dy}{dx})^2]^{3/2}}{\frac{d^2y}{dx^2}}$
- b) Explain Lagrange's undetermined multipliers to determine the extreme values of  $u = f(x, y, z)$  subject to  $\phi(x, y, z) = 0$ .

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
STATISTICS - III  
Discrete Probability Distributions (G04-DSC1-0321)**

Day & Date: Thursday, 30-10-2025  
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 following.****06**

- 1) If  $\text{Corr}(X, Y) = 0.8$ , then  $\text{Corr}(-2X, 3Y)$  is \_\_\_\_\_.
  - a) 1
  - b) 0.8
  - c) -1
  - d) -0.8
- 2) A r. v.  $X \sim B(1, p)$  distribution, then mean and variance of  $X$  are \_\_\_\_\_.
  - a)  $np, npq$
  - b)  $p, pq$
  - c)  $np$  and  $np^2$
  - d) None of these
- 3) If  $X$  = number of male births out of  $n$  births in a hospital, then  $X$  follows \_\_\_\_\_.
  - a) Binomial distribution
  - b) Bernoulli distribution
  - c) Geometric distribution
  - d) Poisson distribution
- 4) The mean and variance of  $\text{Geo}(p)$  distribution are \_\_\_\_\_.
  - a)  $\frac{q}{p}$
  - b)  $\frac{1}{p}$
  - c)  $\frac{p}{q}$
  - d) does not exist
- 5) If  $X$  and  $Y$  are independent, then  $\text{Var}(X + Y)$  \_\_\_\_\_.
  - a)  $\text{Var}(X) + \text{Var}(Y) + 2\text{Cov}(X, Y)$
  - b)  $\text{Var}(X) + \text{Var}(Y) - 2\text{Cov}(X, Y)$
  - c)  $\text{Var}(X) + \text{Var}(Y)$
  - d)  $\text{Var}(X) - \text{Var}(Y)$
- 6) If  $X$  follows discrete uniform distribution on 0,1, 2, 3, 4, then mean of  $X$  is \_\_\_\_\_.
  - a) 5
  - b) 4
  - c) 2
  - d) 3

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

- a) Write conditions of p.m.f.
- b) Define Negative Binomial distribution.

- c) Write definition of independence of two discrete r.v.s.
- d) Define mathematical expectation of a univariate discrete r. v.  $X$ .
- e) If  $Cov(X, Y) = 1.2$ , then find  $Cov(2X + 1, 3Y - 5)$

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

**06**

- a) Suppose  $X$  and  $Y$  are two independent 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 Geometric distribution with parameter  $p$ .
- c) Check whether the following probability distribution is a p.m.f or not?

$X$	0	1	2	3
$P(X)$	0.1	-0.3	0.4	0.2

**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 lack of memory property of a geometric 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 Poisson distribution and also obtain its mean and variance.
- b) State and prove additive property of Binomial distribution.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
ENVIRONMENTAL SCIENCE - III  
Fundamentals of Environmental Biology (G04-DSC1-0323)**

Day & Date: Thursday, 30-10-2025  
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) Taxonomy is the science of \_\_\_\_\_.
  - a) Naming and classification of organism
  - b) Studying DNA sequences
  - c) Ecological interaction
  - d) Evolution of the study
  
- 2) Which Taxonomic rank come below kingdom and above class in animal \_\_\_\_\_.
 

a) Family	b) Genus
c) Phylum	d) Order
  
- 3) The Taxonomic aid which is collection of dried plant specimens is called \_\_\_\_\_.
 

a) Botanical Garden	b) Herbarium
c) Zoological Park	d) Museum
  
- 4) 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
  
- 5) A Hydrophyte is \_\_\_\_\_.
  - a) A desert plant
  - b) An aquatic plant
  - c) A plant growing in saline soil
  - d) A terrestrial Plant
  
- 6) Halophytes are the plants that \_\_\_\_\_.
 

a) Are resistant to fire	b) Grow in saline soil
c) Are resistant to cold	d) Prefer dry sandy soil

- Q.2 Answer the following. (Any Three) 06**
- a) Define Xerophytes with suitable examples.
  - b) Write a note on types of species.
  - c) Define Bio-resources.
  - d) Define Biological Diversity.
  - e) Write a note on Invasive species.
- Q.3 Answer the following. (Any Two) 06**
- a) Write a short note on types of species.
  - b) Explain causes for Loss of Biodiversity.
  - c) Explain major Ecological types of India.
- Q.4 Answer the following (Any Two) 06**
- a) Explain methods of extractions of Bio-resources.
  - b) Explain major food plants in India and world.
  - c) Describe Geological Continental Drift theory.
- Q.5 Answer the following (Any One) 06**
- a) Describe Ecological adaptations in plants with suitable examples.
  - b) Explain theories of origin of Life.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025  
Physics - IV  
Electronic Devices and Applications (G04-DSC1-0302)**

Day & Date: Friday, 31-10-2025  
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) Figures to the right indicate full marks.  
4) Use of log table and calculator is allowed.

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

- 1) Voltage gain of amplifier is \_\_\_\_\_.
  - a)  $V_{out}/V_{in}$
  - b)  $V_{in}/V_{out}$
  - c)  $V_{out} \times V_{in}$
  - d)  $V_{out} - V_{in}$
- 2) Barkhausen criterion is essential for \_\_\_\_\_.
  - a) amplifier
  - b) oscillator
  - c) modulator
  - d) rectifier
- 3) The symbol “ V ~ ” on a digital multimeter represents \_\_\_\_\_.
  - a) DC voltage measurement
  - b) AC voltage measurement
  - c) Resistance measurement
  - d) Capacitance measurement.
- 4) CRO is used to measure \_\_\_\_\_.
  - a) voltage
  - b) frequency
  - c) phase
  - d) All of these
- 5) In a transistor amplifier, the value of feedback factor is \_\_\_\_\_.
  - a) equal to zero
  - b) Equal to unity
  - c) less than unity
  - d) greater than unity
- 6) \_\_\_\_\_ component provides the necessary phase shift in an RC phase shift oscillator.
  - a) Inductor
  - b) Resistor
  - c) Capacitor
  - d) Both resistor and capacitor

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

- a) Define the negative feedback of an amplifier.
- b) What is Lissajous figures?
- c) Draw an equivalent circuit of UJT.
- d) State any two applications of CRO.
- e) What is a tank circuit?

- Q.3 Answer the following questions. (Any Two) 06**
- a) Define differential amplifier. State its different types.
  - b) Write a short note on crystal oscillator.
  - c) Explain transistor series voltage regulator.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Find the frequency of oscillation of tank circuit containing  $L = 20 \mu\text{H}$  and  $C = 200 \text{ pF}$ .
  - b) Explain the construction and working of FET.
  - c) Describe Hartley oscillator with a neat diagram.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain transistor RC coupled amplifier with frequency response and applications.
  - b) Draw the block diagram of digital multimeter and explain its applications.



- Q.3 Answer the following questions. (Any Two) 06**
- Distinguish between double salt and metal complex.
  - The most of compounds of transition elements are coloured. Justify with brief explanation.
  - Explain the magnetic properties of the first transition series elements.
- Q.4 Answer the following questions. (Any Two) 06**
- Discuss the geometrical isomerism for complexes with coordination number (CN=6).
  - Why transition elements can form complexes?
  - Explain the formation of  $CoCl_3 \cdot 6NH_3$ .
- Q.5 Answer the following question. (Any One) 06**
- Discuss the uniform system of nomenclature of complex compounds. Give suitable examples wherever necessary.
  - Write down the name, symbol, atomic number, and observed electronic configuration of 3d block/ first transition series elements.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
BOTANY - IV  
Plant Metabolism (G04-DSC1-0306)**

Day & Date: Friday, 31-10-2025  
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) \_\_\_\_\_ element is macronutrient.
 

a) Fe	b) N
c) Mn	d) Zn
  
- 2) \_\_\_\_\_ type of enzymes catalyzes hydrolysis reactions.
 

a) Oxidoreductases	b) Hydrolases
c) Transferases	d) Lyases
  
- 3) The GA is obtained from the fungi \_\_\_\_\_.
 

a) <i>Gibberella fujikuroi</i>	b) <i>Albugo candida</i>
c) <i>Cercospora spacilotheca</i>	d) <i>Uncinula</i> spp.
  
- 4) The \_\_\_\_\_ bacteria are present in root nodules of leguminous crops.
 

a) <i>Rhizobium</i>	b) Azotobacters
c) Azo-rhizobacters	d) Azospirillum
  
- 5) The general formula of carbohydrate is \_\_\_\_\_.
 

a) $(CH_2O)_n$	b) $(C_4H_2O)_n$
c) $(C_6H_2O)_n$	d) $(C_2H_2O)_n COOH$
  
- 6) \_\_\_\_\_ is the growth promotor,
 

a) CCC	b) ABA
c) Ethylele	d) GA

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

- a) Define Enzyme.
- b) What is biological nitrogen fixation?
- c) Define monosaccharides.
- d) State any two roles of Manganese
- e) Define Micronutrients.

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

- a) State the properties of enzymes
- b) Sketch and label Nitrogen cycle
- c) Give the properties of disaccharides

- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain role of Iron
  - b) Write a note on physiological role of auxin
  - c) State the properties of monosaccharides

- Q.5 Answer the following question. (Any One) 06**
- a) Explain the role and deficiency symptoms of Nitrogen.
  - b) Give an account of biological nitrogen fixation.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
ZOOLOGY - IV  
Fundamentals of Biochemistry (G04-DSC1-0308)**

Day & Date: Friday, 31-10-2025  
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) \_\_\_\_\_ element serves as fundamental building block for major organic molecules.
 

a) Carbon	b) Sodium
c) Potassium	d) Chlorine
  
- 2) Glycogen is a polymer of \_\_\_\_\_.
 

a) Fructose	b) Glucose
c) Lactose	d) Galactose
  
- 3) \_\_\_\_\_ is most common sterols found in animal plasma membranes.
 

a) Sphingolipids	b) Phospholipids
c) Cholesterol	d) Waxes
  
- 4) Nitrogenous bases are paired with each by which bonds?
 

a) Vander wall's Interaction	b) Covalent
c) Co – ordinate	d) Hydrogen
  
- 5) \_\_\_\_\_ is example of muscle protein.
 

a) Keratin	b) Haemoglobin
c) Myoglobin	d) Both a and b
  
- 6) LDH is a example of \_\_\_\_\_.
 

a) Transferase	b) Isozyme
c) Proteases	d) Oxidoreductase

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

- a) Biological Significance of Nitrogen
- b) Monosaccharides
- c) Amino Acid Structure
- d) Primary Structure of Protein
- e) Enlist the Factors affecting enzyme activity

- Q.3 Answer the following questions. (Any Two) 06**
- a) Describe water Soluble Vitamins.
  - b) Describe Biological Significance of Carbohydrates
  - c) Describe Classification of Amino Acids.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Describe compound lipids. Add a note on their biological significance.
  - b) Describe Simple and Conjugated proteins with suitable examples.
  - c) Write an account on classification of enzymes with suitable examples.
- Q.5 Answer the following question. (Any One) 06**
- a) Describe in detail Watson - Crick Model of DNA Double Helix.
  - b) Write an account on water-Soluble vitamins.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Electronics - IV  
Semiconductor Devices (G04-DSC1-0310)**

Day & Date: Friday, 31-10-2025  
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) \_\_\_\_\_ is an intrinsic semiconductor.
  - a) Silicon with phosphorus doping
  - b) Germanium with boron doping
  - c) Pure Silicon
  - d) Gallium Arsenide with doping
  
- 2) The majority carriers in an N-type semiconductor are \_\_\_\_\_.
  - a) Electrons
  - b) Holes
  - c) Protons
  - d) Ions
  
- 3) The ripple factor of a full-wave rectifier is approximately: \_\_\_\_\_.
  - a) 1.21
  - b) 0.48
  - c) 0.7
  - d) 0.2
  
- 4) A Transistor has \_\_\_\_\_.
  - a) one pn junction
  - b) two pn junctions
  - c) three pn junctions
  - d) four pn junctions
  
- 5) Input impedance of FET is \_\_\_\_\_.
  - a) very high
  - b) very low
  - c) zero
  - d) all of these
  
- 6) The basic purpose of a filter is to \_\_\_\_\_.
  - a) regulate input voltage
  - b) regulate output voltage
  - c) remove ripple
  - d) control current

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

- a) State any two acceptor impurity and any two donor impurity
- b) Draw the symbol of a photodiode and state one application.
- c) A transistor has  $\beta = 100$  and  $I_C = 5$  mA. Find the value of  $I_B$  and  $I_E$ .
- d) Define ripple factor and efficiency.
- e) Give applications of FET.

- Q.3 Answer the following questions. (Any Two) 06**
- a) What is Filter? State types of Filter.
  - b) Explain BJT as a Switch.
  - c) Compare BJT and FET.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain Zener diode as a regulator.
  - b) Define  $\alpha$  and  $\beta$  in BJT. How are they related?
  - c) Explain the working and I-V characteristics of N-channel JFET.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain input and output characteristics of a transistor in CE configuration.
  - b) Explain the working of a Full-wave Bridge Rectifier with a neat circuit diagram.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Microbiology - IV  
Microbial Genetics (G04-DSC1-0312)**

Day & Date: Friday, 31-10-2025  
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) The thymine dimer formed after exposure of uv light is repaired by photolyase enzyme is known as \_\_\_\_\_.
  - a) Transduction
  - b) Photolysis
  - c) Photo reactivation
  - d) Transcription
  
- 2) The mutation in which purine is replaced by purine and pyrimidine by pyrimidine is called as \_\_\_\_\_.
  - a) Transition
  - b) Translocation
  - c) Deletion
  - d) Transversion
  
- 3) Meselson and Stahl's experimentally proved that replication occurs by \_\_\_\_\_ mode.
  - a) Despersive
  - b) Conservative
  - c) Semi - conservative
  - d) Semi - Despersive
  
- 4) The rho subunit of the RNA polymerase involved during \_\_\_\_\_ stage of bacterial transcription.
  - a) Initiation
  - b) Elongation
  - c) Splicing
  - d) Termination
  
- 5) \_\_\_\_\_ enzyme seals the gap during DNA replication.
  - a) DNA Primase
  - b) DNA gyrase
  - c) DNA Ligase
  - d) DNA Helicase
  
- 6) The B form of DNA consist \_\_\_\_\_ base pair per turn.
  - a) 9
  - b) 10
  - c) 11
  - d) 12

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

- a) Define Genotype.
- b) What is frame shift mutation?
- c) Write four names of chemical mutagen.
- d) Define Muton.
- e) Induced Mutation

- Q.3 Answer the following. (Any Two) 06**
- a) Write the properties of genetic code.
  - b) Enlist and discuss in brief forms of DNA.
  - c) Give a brief account on replica plate technique.
- Q.4 Answer the following. (Any Two) 06**
- a) Explain in detail Fluctuation test.
  - b) Give a brief account on Missense and nonsense mutation.
  - c) Discuss in short Griffith's experiment
- Q.5 Answer the following. (Any One) 06**
- a) Define repair. Explain in detail dark Repair Mechanism.
  - b) Give a detailed account on mechanism of DNA Replication in bacteria.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
GEOGRAPHY - IV  
Climatology - II (G04-DSC1-0314)**

Day & Date: Friday, 31-10-2025  
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 diagrams & give equations wherever necessary.  
4) Use of maps stencil is allowed.

**Q.1 Fill in the blanks by choosing correct alternatives given below. 06**

- 1) \_\_\_\_\_ is the scientific study of climate, which includes analyzing long-term average weather patterns, their causes, and their changes over time.
 

a) Hydrology	b) Climatology
c) Oceanography	d) Geology
  
- 2) Climatology is the branch of \_\_\_\_\_ Geography.
 

a) Physical	b) Human
c) Political	d) Economic
  
- 3) \_\_\_\_\_ is the process where a liquid changes into a gas form.
 

a) Air Mass	b) Humidity
c) Condensation	d) Evaporation
  
- 4) \_\_\_\_\_ is a violently rotating column of air that extends from a thunderstorm to the ground.
 

a) Condensation	b) Anti-cyclone
c) Cyclone	d) Tornado
  
- 5) The deadliest cyclone to hit India was the 1970 \_\_\_\_\_ cyclone.
 

a) Bholia	b) Chola
c) Cola	d) Tola
  
- 6) Any form of liquid or solid water that falls from the atmosphere to the Earth's surface is called as \_\_\_\_\_.
 

a) Air Mass	b) Humidity
c) Precipitation	d) Evaporation

- Q.2 Answer the following. (Any Three) 06**
- a) Define the concept of precipitation.
  - b) What is sublimation?
  - c) What is humidity?
  - d) Give any three examples of a condensation.
  - e) What is a tornado?
- Q.3 Answer the following. (Any Two) 06**
- a) Explain the types of clouds.
  - b) Explain the types of cyclones.
  - c) What is the difference between condensation and precipitation?
- Q.4 Answer the following. (Any Two) 06**
- a) Explain the effects of Tornado.
  - b) Explain the types of rainfall.
  - c) Explain the causes of cyclone.
- Q.5 Answer the following. (Any One) 06**
- a) Explain the classification of Air mass.
  - b) Explain the difference between cyclone and anticyclone.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Computer Science - IV  
Fundamentals of Database Systems with SQL and PL/SQL  
(G04-DSC1-0316)**

Day & Date: Friday, 31-10-2025  
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) Which of the following is not a feature of DBMS?
  - a) Minimum Duplication and Redundancy of Data
  - b) High Level of Security
  - c) Single-user Access only
  - d) Support ACID Property
  
- 2) After groups have been established, SQL applies predicates in the \_\_\_\_\_ clause, allowing aggregate functions to be used.
 

a) Where	b) Having
c) Group by	d) With
  
- 3) Which of the following is used to denote the selection operation in relational algebra?
 

a) Pi (Greek)	b) Sigma (Greek)
c) Lambda (Greek)	d) Omega (Greek)
  
- 4) The initial state of transaction is \_\_\_\_\_.
 

a) active state	b) final state
c) parallel committed	d) aborted state
  
- 5) Which of the following pair of block structures is mandatory to include in a PL/SQL block?
 

a) BEGIN, END	b) DECLARE, END
c) EXCEPTIONS, BEGIN	d) EXCEPTIONS, END
  
- 6) Which of the following statement does not execute a trigger?
 

a) INSERT	b) UPDATE
c) CREATE	d) SELECT

- Q.2 Answer the following. (Any Three) 06**
- a) List database users.
  - b) What is View?
  - c) What is Normalization?
  - d) What is transaction?
  - e) Define the term:
    - i) Tuple
    - ii) Domain
- Q.3 Answer the following. (Any Two) 06**
- a) Explain Aggregate function with example.
  - b) Explain ACID properties of transaction.
  - c) Explain Specialization with example.
- Q.4 Answer the following (Any Two) 06**
- a) Explain Alter commands with example.
  - b) What is Attribute? Explain different types of attribute.
  - c) Explain components of DBMS.
- Q.5 Answer the following (Any One) 06**
- a) Explain Trigger with example.
  - b) Explain Group by and having clauses with example.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
GEOLOGYS - IV  
Sedimentary Petrology (G04-DSC1-0318)**

Day & Date: Friday, 31-10-2025  
Time: 12:00 PM To 01:30 PM

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) \_\_\_\_\_ is a chemical sedimentary rock.
  - a) Sandstone
  - b) Limestone
  - c) Breccia
  - d) Laterite
  
- 2) Sandstone contains \_\_\_\_\_ sediments.
  - a) Pebbles
  - b) Boulder
  - c) Cobble
  - d) None of these
  
- 3) Limestone formed by precipitation of \_\_\_\_\_.
  - a) Calcium carbonate
  - b) Iron
  - c) Magnesium sulphate
  - d) Manganese sulphate
  
- 4) Sorting of sediments were occur due to \_\_\_\_\_.
  - a) Cementation
  - b) Compaction
  - c) Transportation
  - d) Lithification
  
- 5) \_\_\_\_\_ contains fossils.
  - a) Sandstone
  - b) Limestone
  - c) Mud stone
  - d) Shelly limestone
  
- 6) \_\_\_\_\_ is the Argillaceous sedimentary rock.
  - a) Shale
  - b) Limestone
  - c) Sandstone
  - d) Conglomerate

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

**06**

- a) Describe limestone.
- b) What is cementation?
- c) Describe the mudstone.
- d) Define sedimentary rock.
- e) What is lamination structure?

- Q.3 Write the following. (Any Two) 06**
- a) Explain grit and arkose.
  - b) What is transportation of sediments?
  - c) What is a residual sedimentary rock?

- Q.4 Answer the following. (Any Two) 06**
- a) Describe the mud crack and ripple mark structures in sedimentary rock.
  - b) Describe the clastic and pisolitic structures in sedimentary rock.
  - c) Describe the organic deposits of sedimentary rock.

- Q.5 Answer the following. (Any One) 06**
- a) Describe the process of formation of sedimentary rock.
  - b) Describe chemical deposits of sedimentary rock.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Mathematics - IV  
Laplace Transform (G04-DSC1-0320)**

Day & Date: Friday, 31-10-2025  
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. (MCQ)****06**

1)  $L\left\{\frac{e^{at}-1}{a}\right\} = \underline{\hspace{2cm}}$ .

a)  $\frac{1}{p^2(p-a)}$

b)  $\frac{1}{p(p-a)^2}$

c)  $\frac{1}{p(p-a)}$

d)  $\frac{a}{p(p-a)}$

2)  $L\{\sin t \cos t\} = \underline{\hspace{2cm}}$ .

a)  $\frac{1}{p^2+4}$

b)  $\frac{2}{p^2+4}$

c)  $\frac{1}{2} \frac{p}{p^2+4}$

d)  $\frac{4}{p^2+4}$

3)  $L^{-1}\left\{\frac{12}{4-3p}\right\} = \underline{\hspace{2cm}}$ .

a)  $-4 e^{4t/3}$

b)  $4 e^{4t/3}$

c)  $4 e^{-4t/3}$

d)  $\frac{-4}{3} e^{4t/3}$

4)  $L^{-1}\left\{\frac{p}{(p^2+1)^2}\right\} = \frac{t \sin t}{2}$  then  $L^{-1}\left\{\frac{32p}{(16p^2+1)^2}\right\} = \underline{\hspace{2cm}}$ .

a)  $\frac{1}{4} \sin(t/4)$

b)  $\frac{t \sin 4t}{4}$

c)  $\frac{t}{4} \sin(t/4)$

d)  $\frac{t \sin t}{4}$

5)  $L\left\{\frac{\partial y}{\partial t}\right\} = \underline{\hspace{2cm}}$  if  $y = y(x, t)$

a)  $x\bar{y}(x, p) + y(x, 0)$

b)  $p\bar{y}(x, p) - y(x, 0)$

c)  $p\bar{y}(x, 0) - y(x, p)$

d)  $\frac{d\bar{y}}{dt}$



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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Statistics - IV  
Continuous Probability Distributions - I (G04-DSC1-0322)**

Day & Date: Friday, 31-10-2025  
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 p. d. f. of a r. v.  $X$  is given by;

$$f(x) = \begin{cases} \frac{k}{x} & 1 < x < 3 \\ 0 & \text{; otherwise} \end{cases}$$

Then  $k =$  \_\_\_\_\_.

- |                       |                 |
|-----------------------|-----------------|
| a) $-\log 3$          | b) $\log 3$     |
| c) $\frac{1}{\log 3}$ | d) $(\log 3)^2$ |
- 2) A continuous r. v.  $X$  has measures of skewness  $\beta_1 = 2, \mu_3 = 4$ , then its variance is \_\_\_\_\_.
- |      |      |
|------|------|
| a) 4 | b) 2 |
| c) 6 | d) 8 |
- 3) If the joint probability density function  $X$  and  $Y$  is \_\_\_\_\_.
- $$f(x, y) = \begin{cases} \frac{1}{2}(3 - x - y) & , 0 \leq x \leq 1, 0 \leq y \leq 1 \\ 0 & , \text{otherwise} \end{cases}$$
- Then the marginal density function of  $Y$  is \_\_\_\_\_.
- |  |  |
|--|--|
| a) $f(y) = \frac{1}{2}\left(\frac{5}{2} - y\right), 0 \leq y \leq 1$ | b) $f(y) = \frac{1}{2}\left(y - \frac{5}{2}\right), 0 \leq y \leq 1$ |
| c) $f(y) = \frac{(3 - y)}{2}, 0 \leq y \leq 1$                       | d) $f(y) = \frac{3}{2}, 0 \leq y \leq 1$                             |
- 4) The order of partial regression coefficient  $b_{12.345\dots n}$  is \_\_\_\_\_.
- |            |            |
|------------|------------|
| a) $n$     | b) $n + 2$ |
| c) $n - 1$ | d) $n - 2$ |
- 5) The range of multiple correlation coefficient is \_\_\_\_\_.
- |                  |                          |
|------------------|--------------------------|
| a) 0 to 1        | b) $-1$ to 1             |
| c) 0 to $\infty$ | d) $-\infty$ to $\infty$ |



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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
ENVIRONMENTAL SCIENCE - IV  
Ecology and Environment (G04-DSC1-0324)**

Day & Date: Friday, 31-10-2025  
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) What role do decomposers play in the food web?
  - a) Consume producers directly
  - b) Break down dead organisms and recycle nutrients
  - c) Hunt herbivores
  - d) Produce food through photosynthesis
  
- 2) A food web is \_\_\_\_\_.
  - a) A linear sequence of organisms
  - b) A network of interconnected food chains
  - c) Only includes producers and consumers
  - d) Always start with an herbivore
  
- 3) Which of the following is an example of a tertiary consumer?
 

a) Grass	b) Grasshopper
c) Frog	d) Hawk
  
- 4) Which of the following is a density-dependent factor?
 

a) Flood	b) Earthquake
c) Disease	d) Temperature
  
- 5) Which gas is a major contributor to the greenhouse effect and part of the carbon cycle?
 

a) Oxygen	b) Nitrogen
c) Carbon dioxide	d) Hydrogen
  
- 6) Plants absorb nitrogen mostly in the form of \_\_\_\_\_.
 

a) Nitrogen gas	b) Ammonia
c) Nitrates	d) Proteins

- Q.2 Answer the following. (Any Three) 06**
- a) Discuss mangrove ecosystem.
  - b) Write importance of food chain in an ecosystem.
  - c) Define ecotone, give examples.
  - d) Write factors affecting population size in an ecosystem.
  - e) Define abiotic components and give examples.
- Q.3 Answer the following. (Any Two) 06**
- a) Describe food chain with examples in detail.
  - b) Write characteristics of Aquatic ecosystems.
  - c) Discuss characteristics of a population.
- Q.4 Answer the following. (Any Two) 06**
- a) Describe boreal forest with example in detail.
  - b) Write a short note on gaseous cycle.
  - c) Describe desert ecosystem with example in detail.
- Q.5 Answer the following. (Any One) 06**
- a) Describe ecological succession and its types.
  - b) Explain Bioaccumulation in detail with example.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
PHYSICS - III  
Thermal Physics and Sound (G04-DSC2-0301)**

Day & Date: Saturday, 01-11-2025  
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) The second law of thermodynamics deals with the \_\_\_\_\_.  
a) Flow of heat energy                      b) Flow of gas molecules  
c) Momentum                                      d) Diffusion of gas molecules
- 2) When water vapour condenses into water, its entropy \_\_\_\_\_.  
a) increases                                      b) decreases  
c) remains constant                              d) zero
- 3) Absolute scale of temperature was given by \_\_\_\_\_.  
a) Kelvin    b) Planck  
c) Joule    d) Faraday
- 4) Microphone is an \_\_\_\_\_ transducer,  
a) Electro-optical                                      b) Electro-acoustical  
c) Electro-mechanical                              d) Thermo-electrical
- 5) The coefficient of absorption of an open window is \_\_\_\_\_.  
a) zero    b) one  
c) two    d) three
- 6) Decay of sound energy in a hall is \_\_\_\_\_.  
a) constant    b) linear  
c) exponential    d) sinusoidal

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

- a) State the first law of thermodynamics.
- b) What is entropy?
- c) What are transducers?
- d) What is intensity of sound?
- e) What is isothermal change?

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

- a) Explain reversible and irreversible processes with suitable example.
- b) Explain the entropy of a perfect gas.
- c) Explain the factors affecting acoustics of buildings.

- Q.4 Answer the following questions. (Any Two) 06**
- a) Derive Sabine's formula for reverberation time.
  - b) Derive an expression for work done during isothermal change.
  - c) Explain T-S diagram.

- Q.5 Answer the following question. (Any One) 06**
- a) Define adiabatic change. Obtain an adiabatic relation between pressure and volume.
  - b) What is loudspeaker? Explain the construction and working of moving coil loudspeaker.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025**

**CHEMISTRY - III**

**General Physical Chemistry - I (G04-DSC2-0303) / (G04-DSC2-0335)**

Day & Date: Saturday, 01-11-2025  
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) The graph of the linear equation is always in the form of \_\_\_\_\_.  
a) circle  
b) straight line  
c) sphere  
d) curve
- 2) Natural process is \_\_\_\_\_.  
a) spontaneous  
b) reversible  
c) non-spontaneous  
d) adiabatic
- 3) The Nernst's distribution law is also known as \_\_\_\_\_.  
a) Henry's law  
b) Raoult's law  
c) Partition law  
d) Equilibrium law
- 4) Integration of the term  $e^x \cdot dx$  is \_\_\_\_\_.  
a)  $X + C$   
b)  $e^x$   
c)  $e^x + c$   
d)  $e^x - c$
- 5) The electrolytes ionizing completely are known as \_\_\_\_\_ electrolyte.  
a) weak  
b) strong  
c) moderate  
d) None of these
- 6) Efficiency of heat engine is always \_\_\_\_\_.  
a) less than one  
b) greater than one  
c) equal to one  
d) All of these

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

- a) Define spontaneous and non-spontaneous process.
- b) List two factors that influence degree of ionization.
- c) State the types of electrolyte with example.
- d) Give any two statements of second law thermodynamics.
- e) State Nernst's distribution law.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain in brief, indefinite and definite integral.
  - b) Give an account of the process of extraction.
  - c) Explain the common-ion effect and describe its impact on the solubility of a sparingly soluble salt.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain in brief heat engine and its efficiency.
  - b) Derive the Henderson equation.
  - c) Explain different form of equation of straight line.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain any two application of distribution law in detail.
  - b) What is differentiation? Explain the rules of differentiation without poof.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025  
BOTANY - III  
Economic Botany (G04-DSC2-0305)**

Day & Date: Saturday, 01-11-2025  
Time: 12:00 PM To 01:30 PM

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 \_\_\_\_\_ is NOT a cereal grain.
 

a) Rice	b) Wheat
c) Maize	d) Soyabean
- 2) A pod is a characteristics feature of \_\_\_\_\_.
 

a) Legumes	b) Grains
c) Fruits	d) Vegetables
- 3) The \_\_\_\_\_ state is the largest producer of sugarcane in India.
 

a) Maharashtra	b) Utter Pradesh
c) Tamil Nadu	d) Karnataka
- 4) The part used as spice of clove plant is \_\_\_\_\_.
 

a) Seed	b) Leaf
c) Flower bud	d) Root
- 5) \_\_\_\_\_ is the natural fiber.
 

a) Nylon	b) Polyester
c) Cotton	d) Rayon
- 6) The process of drying ginger results in the formation of \_\_\_\_\_.
 

a) Zingiberene	b) Shogaols
c) Paradol	d) Zingerone

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

- a) Write the family and part used of clove plant.
- b) Give the botanical name of cotton.
- c) Write uses of *Lawsonia* (Mehandi).
- d) Enlist the evolved new crop varieties.
- e) Define germplasm.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Write a short note on production of dyes.
  - b) Give importance of germplasm diversity.
  - c) Write nutritive value of chickpea.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Give economic importance of groundnut.
  - b) Write steps for processing of sugarcane.
  - c) Give significance of spices.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain in brief morphology, cultivation method and economic importance of jowar.
  - b) Describe production, cultivation method and economic importance of ginger.



- Q.3 Answer the following questions. (Any Two) 06**
- a) Describe law of segregation with suitable example.
  - b) Give an account on sex determination in human.
  - c) What are the symptoms of Turner syndrome.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Describe the law of independent assortment.
  - b) Define the term complete linkage with suitable example.
  - c) What is crossing over? Write importance of crossing over.
- Q.5 Answer the following question. (Any One) 06**
- a) Describe the term multiple alleles with suitable example.
  - b) Write a note on supplementary gene interaction.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025  
ELECTRONICS - III  
Digital Techniques (G04-DSC2-0309)**

Day & Date: Saturday, 01-11-2025  
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) The main function of a magnitude comparator is to \_\_\_\_\_.  
a) Add two binary numbers      b) Compare two binary numbers  
c) Convert decimal to binary      d) Multiply two binary numbers
- 2) The IC number for an 8-to-3 priority encode is \_\_\_\_\_.  
a) 74138                              b) 74148  
c) 74153                              d) 74154
- 3) A 1-to-4 Demultiplexer requires \_\_\_ select lines.  
a) 1                                      b) 4  
c) 2                                      d) 3
- 4) Maximum number of Flipflop required for Mod 5 Counter is \_\_\_\_\_.  
a) 2                                      b) 5  
c) 4                                      d) 3
- 5) Multiplexers are also known as \_\_\_\_\_.  
a) Data distributors              b) Data Adders  
c) Data Selectors                  d) Data Convertors
- 6) A ring counter with 4 flip-flops has \_\_\_\_\_ states.  
a) 8 states                              b) 5 states  
c) 4 states                              d) 10 states

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

- a) Draw logic diagram of 1:4 Demultiplexer using logic Gates.
- b) State an encoder and Decoder.
- c) Define toggle condition in JK flip-flop.
- d) Define MOD term of a counter.
- e) State different types of Shift Register.

- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain working of an 4-to-1 multiplexer with truth table.
  - b) Draw logic diagram of 3-to-8 decoder.
  - c) Explain in brief JK flip-flop with logic diagram.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain in brief 3- bit asynchronous counter.
  - b) Draw block diagram of IC7490 as a MOD-2 counter.
  - c) Compare Counter and Shift Register.
- Q.5 Answer the following question. (Any One) 06**
- a) Explain Johnson counter with timing diagram.
  - b) Explain Decade Counter with timing diagram.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
MICROBIOLOGY - III  
Microbial Macromolecules and Physiology (G04-DSC2-0311)**

Day & Date: Saturday, 01-11-2025  
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 diagrams wherever necessary.

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

- 1) The direct microscopic count method uses \_\_\_\_\_.  
a) Petroff-Hausser chamber      b) Coulter counter  
c) Turbidometer                      d) Colony counter
- 2) The major storage form of lipids in microbes is \_\_\_\_\_.  
a) Steroids                              b) Triglycerides  
c) Glycolipids                          d) Phospholipids
- 3) Penicillin inhibits bacterial growth by interfering with \_\_\_\_\_.  
a) Protein synthesis                  b) DNA replication  
c) Cell wall synthesis                 d) RNA transcription
- 4) The monomeric unit of carbohydrates is \_\_\_\_\_.  
a) Amino acids                         b) Monosaccharides  
c) Nucleotides                         d) Fatty acids
- 5) The time required for a bacterial population to double is called as \_\_\_\_\_.  
a) Growth rate                         b) Lag time  
c) Generation time                     d) Stationary phase
- 6) The protein part of an enzyme without cofactors is called as \_\_\_\_\_.  
a) Holoenzyme                         b) Apoenzyme  
c) Coenzyme                             d) Prosthetic group

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

- a) Define bacterial growth rate.
- b) Distinguish between DNA and RNA.
- c) Write two functions of proteins in living organisms.
- d) Enlist the advantages and disadvantages of SPC.
- e) What are inducible enzymes? Give an example.

- Q.3 Answer the following. (Any Two) 06**
- a) Write in short Effect of temperature on bacterial growth.
  - b) Describe secondary structure of proteins with diagrams.
  - c) Write in short Lock and Key hypothesis of enzyme action.
- Q.4 Answer the following (Any Two) 06**
- a) Write a note on synchronous growth.
  - b) Write in short the effect of heavy metals on bacterial growth.
  - c) Differentiate between extracellular and intracellular enzymes with their examples.
- Q.5 Answer the following (Any One) 06**
- a) Explain in detail the Watson and Crick model of DNA.
  - b) Describe in detail bacterial growth phases with a neat diagram.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025  
GEOGRAPHY – III  
Geography of India - I (G04-DSC2-0313)**

Day & Date: Saturday, 01-11-2025  
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 diagrams wherever necessary.

**Q.1 Fill in the blanks by choosing correct alternatives given below. 06**

- 1) India's north-south extent is \_\_\_\_\_ kilometers (from the northernmost point in Kashmir to the southernmost point at Kanyakumari)
  - a) 3,014
  - b) 3,114
  - c) 3,214
  - d) 3,314
- 2) Old alluvial soil is called \_\_\_\_\_.
  - a) Bangar or Bhangar
  - b) Khadar
  - c) Petty
  - d) Black
- 3) The climate of India is broadly labeled as a \_\_\_\_\_ climate.
  - a) Temperate
  - b) Humid Subtropical
  - c) Arid & Semi-Arid
  - d) Tropical Monsoon
- 4) The word "monsoon" is derived from the \_\_\_\_\_ word "mausim," meaning "season".
  - a) Latin
  - b) Greek
  - c) Irani
  - d) Arabic
- 5) India has diverse soils, officially classified by the \_\_\_\_\_ into eight major types.
  - a) ISRO
  - b) HCAR
  - c) ICAR
  - d) PCAR
- 6) \_\_\_\_\_ has the highest forest cover in India by area.
  - a) AP
  - b) UP
  - c) MP
  - d) TN

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

- a) Which type of forest is the highest percentage in India?
- b) What is the location of India with latitude and longitude?
- c) Where is black soil found in India?
- d) How many types of monsoon are there in India?
- e) What are the types of Himalayas can be described longitudinally?

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the common soil conservation practices?
  - b) Explain the climatic region of India?
  - c) Explain the goals and methods of forest conservation?
- Q.4 Answer the following (Any Two) 06**
- a) Why soil conservation is important?
  - b) Define alluvial soil and explain its types?
  - c) Explain the Tropical evergreen rain forests in India?
- Q.5 Answer the following (Any One) 06**
- a) What is monsoon and explain factors affecting monsoon in India?
  - b) Explain the physiographic division of India.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Computer Science - III  
Data Visualization (G04-DSC2-0315)**

Day & Date: Saturday, 01-11-2025  
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 from the options. 06**

- 1) \_\_\_\_\_ Option is used to fill missing values in a column with the value from the row above?
  - a) Replace Values
  - b) Fill Down
  - c) Group By
  - d) Aggregate
- 2) In DAX, which function is used to count distinct values?
  - a) COUNTROWS()
  - b) COUNTA()
  - c) DISTINCTCOUNT()
  - d) COUNT()
- 3) Which visualization is best suited for showing trends over time?
  - a) Pie Chart
  - b) Line Chart
  - c) Matrix
  - d) TreeMap
- 4) In Power BI, which refresh option updates data from cloud-based sources automatically?
  - a) DirectQuery
  - b) Scheduled Refresh
  - c) On-Demand
  - d) Incremental
- 5) Which of the following is a logical DAX function?
  - a) AND()
  - b) LEFT()
  - c) SUMX()
  - d) FORMAT()
- 6) Which chart is suitable to show part-to-whole comparison with hierarchy drill-down?
  - a) Donut Chart
  - b) Waterfall
  - c) TreeMap
  - d) Card

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

- a) What is DAX.
- b) What is Power BI Gateway?
- c) What are "Data Hierarchy" with example?
- d) Define Merge Queries with an example.
- e) Explain Page Navigation in Power BI reports.

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

- a) Explain types of filters with examples.
- b) Describe Gauge Chart and its key features.
- c) What is Conditional Formatting? Explain with examples.

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

- a) Explain different types of slicers and their types.
- b) What is the difference between Calculated Columns and Custom Columns?
- c) Explain “Data Cleansing” operations in Power Query Editor.

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

- a) What is a Funnel Chart? Explain its purpose and give examples of its use in business.
- b) Consider the following Employee Salary Dataset and answer using Dax:

EmpID	Name	Department	Salary	Bonus	HireDate	City
201	Ramesh	HR	45000	5000	2019-04-12	Mumbai
202	Sunita	IT	60000	7000	2020-06-10	Delhi
203	Arjun	Finance	52000	6000	2018-01-23	Pune
204	Meena	IT	58000	8000	2021-09-15	Chennai
205	Priya	HR	49000	4500	2020-11-01	Delhi
206	Karan	Finance	53000	6200	2019-03-05	Bangalore

- 1) Calculate the total Salary by Department.
- 2) Find the average Bonus of employees in IT department
- 3) List employees hired after 2020.
- 4) Count the employees whose Salary is greater than 55.000.
- 5) Show total Salary + Bonus for all employees.
- 6) Find the highest salary in each department.

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**B.Sc.(Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
GEOLOGY - III  
Elements of Rocks - I (Igneous Rocks) (G04-DSC2-0317)**

Day & Date: Saturday, 01-11-2025  
Time: 12:00 PM To 01:30 PM

Max. Marks: 30

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

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

**06**

- 1) Diorite is \_\_\_\_ igneous rock.
  - a) Intrusive
  - b) Hypabyssal
  - c) Extrusive
  - d) None of these
- 2) \_\_\_\_ is coarse grained igneous rock.
  - a) Basalt
  - b) Obsidian
  - c) Granite
  - d) All of these
- 3) The essential mineral in Basalt rock are \_\_\_\_\_.
  - a) Quartz, feldspar
  - b) Quartz, Augite
  - c) Quartz, olivine
  - d) Olivine, Augite
- 4) Quartz is rare or absent in \_\_\_\_ rock.
  - a) Acidic
  - b) Ultrabasic
  - c) Basic
  - d) None of these
- 5) The phenocryst crystals in igneous rock are to develop \_\_\_\_ texture.
  - a) Granitic
  - b) Porphyritic
  - c) Glassy
  - d) None of these
- 6) Sill is \_\_\_\_ Form of igneous rock.
  - a) Concordant
  - b) Discordant
  - c) Acidic
  - d) None of these

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

**06**

- a) What is acidic and basic magma?
- b) Define texture in igneous rock.
- c) What is rock?
- d) Describe basalt
- e) Give the names of concordant forms.

- Q.3 Answer the following. (Any Two) 06**
- a) Describe the classification of igneous rock based on silica percentage.
  - b) Describe Volcanic igneous rock.
  - c) Describe the sill and laccolith.
- Q.4 Answer the following (Any Two) 06**
- a) Describe the plutonic igneous rock.
  - b) Describe any two discordant forms of igneous rock.
  - c) Describe the porphyritic and granitic textures.
- Q.5 Answer the following (Any One) 06**
- a) Describe structures of igneous rock.
  - b) Describe the rock cycle.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
MATHEMATICS - III  
Fundamentals of Differential Calculus (G04-DSC2-0319)**

Day & Date: Saturday, 01-11-2025  
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. (MCQ)****06**

- 1) The necessary condition for a function  $f(x, y)$  to have maximum or minimum value at a point  $(a, b)$  are \_\_\_\_\_.
  - a)  $\frac{\partial f}{\partial x} \neq 0 = \frac{\partial f}{\partial y}$  at  $(a, b)$
  - b)  $\frac{\partial f}{\partial x} = \frac{\partial f}{\partial y}$  at  $(a, b)$
  - c)  $\frac{\partial f}{\partial x} = 0 = \frac{\partial f}{\partial y}$  at  $(a, b)$
  - d)  $\frac{\partial f}{\partial x} \neq \frac{\partial f}{\partial y}$  at  $(a, b)$
  
- 2) A 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)  $AC + B^2 > 0$
  
- 3) If  $x = r \cos \theta, y = r \sin \theta$  then  $\frac{\partial(r, \theta)}{\partial(x, y)} \cdot \frac{\partial(x, y)}{\partial(r, \theta)} =$  \_\_\_\_\_.
  - a) 0
  - b) 1
  - c) 2
  - d)  $\infty$
  
- 4) If  $u = x + y - a - b, v = ab - bx - ay$  then  $\frac{\partial(u, v)}{\partial(x, y)} =$  \_\_\_\_\_.
  - a)  $a - b$
  - b)  $b - a$
  - c)  $\frac{1}{a-b}$
  - d)  $\frac{1}{a+b}$
  
- 5) Radius of curvature of curve  $y = e^x$  at the point  $(a, b)$  is \_\_\_\_\_.
  - a)  $2\sqrt{2}$
  - b)  $\sqrt{2}$
  - c) 0
  - d)  $4\sqrt{2}$
  
- 6) Radius of curvature of curve  $s = 3a \sin \Psi$  at  $\Psi = 0$  is \_\_\_\_\_.
  - a) 0
  - b)  $a$
  - c)  $2a$
  - d)  $3a$

- Q.2 Answer the following questions. (Any Three) 06**
- Find the radius of curvature at any point for  $S = c \log \sec \psi$
  - Define Jacobian of  $u$  &  $v$  with respect to  $x, y$ .
  - If  $x = r \cos \theta, y = r \sin \theta$  then find  $\frac{\partial(x,y)}{\partial(r,\theta)}$
  - State the necessary condition for extreme value of a function  $f(x, y)$ .
  - Find probable point for extreme value of the function  $x^2 + 2xy + 2y^2 + 2x + y$
- Q.3 Answer the following questions. (Any Two) 06**
- Explain LaGrange's method of undetermined multipliers to find extreme value of  $f(x, y)$  subject to  $\phi(x, y) = 0$
  - If  $u = \frac{yz}{x}, v = \frac{zx}{y}, w = \frac{xy}{z}$ , find  $\frac{\partial(u,v,w)}{\partial(x,y,z)}$
  - Find the radius of curvature of the parabola  $x = at^2, y = 2at$  at  $t$
- Q.4 Answer the following questions. (Any Two) 06**
- Obtain an expression for the radius of curvature for Cartesian equation  $y = f(x)$
  - Find the extreme value of the function  $x^2y^2 - 5x^2 - 8xy - 5y^2$
  - If  $x = r \sin \theta \cos \phi, y = r \sin \theta \sin \phi, z = r \cos \theta$  find  $\frac{\partial(x,y,z)}{\partial(r,\theta,\phi)}$
- Q.5 Answer the following question. (Any One) 06**
- Find extreme value of  $x^2 + y^2 + z^2$  subject to the condition  $ax + by + cz = p$
  - Let  $u, v, w$  be function of three variables  $x, y, z$ . If the Jacobin  $J$  of  $u, v, w$  with respect to  $x, y, z$  and the Jacobian  $J'$  of  $x, y, z$  with respect to  $u, v, w$  the  $JJ' = 1$

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
STATISTICS - III**

**Introduction to Discrete Probability Distributions (G04-DSC2-0321)**

Day & Date: Saturday, 01-11-2025  
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 p. g. f. of Binomial distribution with parameters  $(n, p)$  is \_\_\_\_\_.
  - a)  $q + ps$
  - b)  $q + ps^n$
  - c)  $p + qs^n$
  - d)  $(q + ps)^n$
- 2) If  $X$  has hyper-geometric distribution with  $(20, 8, 5)$  then its mean is \_\_\_\_\_.
  - a) 8
  - b) 2
  - c) 4
  - d) 5
- 3) 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)
- 4) If  $X \sim NB(k, p)$  such that  $E(X) = 9$  and  $V(X) = 36$ , then \_\_\_\_\_.
  - a)  $k = 9, p = 0.33$
  - b)  $k = 3, p = 0.25$
  - c)  $k = 36, p = 0.25$
  - d)  $k = 3, p = 0.33$
- 5) The sex of a new born child is recorded as male or female in a hospital is an real life situation where \_\_\_\_\_.
  - a) Binomial distribution is used
  - b) Discrete uniform distribution is used
  - c) Bernoulli distribution is used
  - d) None of these
- 6) If  $X$  and  $Y$  are two independent r.v.s. then  $V(X - Y) =$  \_\_\_\_\_.
  - a)  $V(X) + V(Y) - 2 \text{Cov}(X, Y)$
  - b)  $V(X) + V(Y) + 2 \text{Cov}(X, Y)$
  - c)  $V(X) + V(Y)$
  - d)  $V(X) - V(Y)$

- Q.2 Answer the following. (Any Three) 06**
- a) Define raw moments of r. v.  $X$ .
  - b) Define uniform distribution.
  - c) Define probability mass function (p.m.f.) of discrete random variable  $X$ .
  - d) Define marginal probability distribution of  $X$ , when  $(X, Y)$  be a two dimensional discrete r. v.
  - e) Define geometric distribution.
- Q.3 Answer the following. (Any Two) 06**
- a) Define probability generating function. Show that the p.g.f. of sum of two independent random variable is equal to product of their p.g.f.
  - b) State the properties of cumulative distribution function.
  - c) State and prove recurrence relation for probability of Binomial distribution.
- Q.4 Answer the following (Any Two) 06**
- a) Find mean and variance of Bernoulli distribution.
  - b) State and prove lack of memory property of geometric distribution.
  - c) State and prove additive property of Poisson distribution.
- Q.5 Answer the following (Any One) 06**
- a) Find probability generating function of binomial distribution. Hence find mean and variance.
  - b) Define Poisson distribution and find mean of Poisson distribution.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Environmental Science - III  
Environmental Issues and Case Studies (G04-DSC2-0323)**

Day & Date: Saturday, 01-11-2025  
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 diagrams wherever necessary.

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

- 1) Which of the following is a case study for desertification control in India?
  - a) Project Tiger
  - b) Aravalli Reforestation
  - c) Swachh Bharat Abhiyan
  - d) Yamuna River Cleanup
- 2) Olive Ridley Turtle Conservation is an example of: \_\_\_\_\_.
  - a) Forest restoration
  - b) Biodiversity conservation
  - c) Waste management
  - d) Renewable energy initiative
- 3) Deforestation contributes to: \_\_\_\_\_.
  - a) Climate change and soil degradation
  - b) Air pollution only
  - c) Renewable energy production
  - d) Solid waste management
- 4) Solar, wind, and hydroelectric energy projects are examples of: \_\_\_\_\_.
  - a) Non-renewable energy solutions
  - b) Sustainable energy solutions
  - c) Waste management strategies
  - d) Biodiversity conservation
- 5) Community-based conservation emphasizes: \_\_\_\_\_.
  - a) Role of government only
  - b) Local communities' involvement
  - c) Industrial emissions reduction
  - d) Glacier melting prevention
- 6) Swachh Bharat Abhiyan is primarily a case study of: \_\_\_\_\_.
  - a) Renewable energy
  - b) Solid waste management
  - c) Disaster recovery
  - d) Biodiversity conservation

- Q.2 Answer the following. (Any Three) 06**
- a) Mention one major cause of groundwater depletion?
  - b) What is watershed management?
  - c) Give one example of climate change impact?
  - d) Name one marine species under conservation efforts?
  - e) Name one initiative for e-waste management.
- Q.3 Answer the following. (Any Two) 06**
- a) Explain the major sources of water pollution.?
  - b) Describe Olive Ridley Turtle conservation efforts?
  - c) Explain one renewable energy initiative in India.
- Q.4 Answer the following (Any Two) 06**
- a) Describe community-based conservation?
  - b) Explain the role of international environmental agreements?
  - c) Explain desertification with an example.
- Q.5 Answer the following (Any One) 06**
- a) Explain biodiversity conservation with examples of endangered species and habitat restoration.
  - b) Explain eco-friendly and green initiatives with urban planning examples?

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
BIOCHEMISTRY - I  
Biomolecules (G04-DSC2-0325)**

Day & Date: Saturday, 01-11-2025  
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 diagrams wherever necessary.

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

06

- 1) Glycosidic bond in maltose is \_\_\_\_\_.
  - a)  $\alpha$  1  $\rightarrow$  4
  - b)  $\beta$  1  $\rightarrow$  4
  - c)  $\alpha$  1  $\rightarrow$  2
  - d)  $\beta$  1  $\rightarrow$  2
- 2) Which of the following is a non-reducing sugar?
  - a) Maltose
  - b) Lactose
  - c) Sucrose
  - d) Glucose
- 3) Bond between amino acids in proteins is \_\_\_\_\_.
  - a) Peptide bond
  - b) Ionic bond
  - c) Double bond
  - d) Hydrogen bond
- 4) Which of the following is a purine base?
  - a) Adenine
  - b) Cytosine
  - c) Uracil
  - d) Thymine
- 5) Vitamin B2 is also called as \_\_\_\_\_.
  - a) Riboflavin
  - b) Niacin
  - c) Thiamine
  - d) Retinol
- 6) Sugar found in DNA is \_\_\_\_\_.
  - a) Ribose
  - b) Deoxy ribose
  - c) Glucose
  - d) Deoxy glucose

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

06

- a) What are differences between oils and fats?
- b) Write the structure of two amino acids with hydroxyl group.
- c) What are epimers?
- d) What is zwitterion of an amino acid?
- e) Name two basic amino acids

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

- a) Define apoenzyme, coenzyme and holoenzyme.
- b) Name and define two types of compound lipids. Write one example of each.
- c) Describe forces stabilizing native structure of proteins.

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

- a) Write the differences between DNA and RNA.
- b) Explain the structure of tRNA.
- c) Write a note on carotenes

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

- a) Write the structure, biochemical role and deficiency disorder of Niacin.
- b) Define monosaccharides and classify types of monosaccharides with example.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
GEOCHEMISTRY  
Introduction to Geochemistry (G04-DSC2-0327)**

Day & Date: Saturday, 01-11-2025  
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) Which of the following is an example of a homologous series?
  - a) Alkanes
  - b) Alkenes
  - c) Alkynes
  - d) All of the above
  
- 2) \_\_\_\_\_ is the structure of CsCl.
  - a) Face-centered cubic
  - b) Body-centered cubic
  - c) Hexagonal close-packed
  - d) Simple cubic
  
- 3) The empirical formula of a compound \_\_\_\_\_.
  - a) The simplest whole-number ratio of atoms of each element in the compound
  - b) The actual number of atoms of each element in the compound
  - c) The molecular weight of the compound
  - d) The structural formula of the compound
  
- 4) Organic compounds are \_\_\_\_\_ in nature.
  - a) Ionic
  - b) Covalent
  - c) Highly soluble
  - d) All of the above
  
- 5) The coordination number of  $\text{Na}^+$  in the NaCl structure is \_\_\_\_\_.
  - a) 4
  - b) 6
  - c) 8
  - d) 12
  
- 6) The structure of sodium chloride is \_\_\_\_\_.
  - a) Face-centered cubic
  - b) Body-centered cubic
  - c) Hexagonal close-packed
  - d) Simple cubic

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

- a) What is triple point in a phase diagram?
- b) Define lattice energy of crystals.
- c) Define Colloids.

- d) What is coordination number?
- e) Define the term degrees of freedom.

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

- a) Goldschmidt's Mineralogical phase rule
- b) Structure of Sodium Chloride
- c) General characteristics of organic compounds

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

- a) Write a note on geological evidences of silica and clay minerals.
- b) Explain general rules of the three-dimensional structure with the help of solid geometry.
- c) What are homologous series? Explain them.

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

- a) Discuss electrical, mechanical and optical properties of colloids.
- b) Describe phase diagram of water system.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
PLANT PROTECTION  
Major Crops and Methods of Integrated Plant Protection  
(G04-DSC2-0329)**

Day & Date: Saturday, 01-11-2025  
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) Soya milk is obtained from \_\_\_\_\_.
  - a) G. nut
  - b) Cow
  - c) Soyabean
  - d) Tur
  
- 2) Africa country is an origin of crop \_\_\_\_\_.
  - a) Tur
  - b) Jawar
  - c) Sugarcane
  - d) Brinjal
  
- 3) \_\_\_\_\_vegetable are used to prepare bharit.
  - a) Cabbage
  - b) Soyabean
  - c) Brinjal
  - d) None of these
  
- 4) \_\_\_\_\_ are called nematicides.
  - a) Chemical used to kill fungi
  - b) Chemicals used to kill bacteria
  - c) Chemicals used to kill nematodes
  - d) Chemicals used to check viruses.
  
- 5) Chemicals are used to check insects are known as \_\_\_\_\_.
  - a) Bactericides
  - b) Insecticides
  - c) Nematicides
  - d) Fungicides
  
- 6) \_\_\_\_\_ is effective mechanical method of plant protection.
  - a) Tillage practices
  - b) Heating soil
  - c) Light trapping
  - d) None of these

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

- a) Give the types of biofertilizer.
- b) What is netting?
- c) Write on crop hygiene.
- d) What is field sanitation?
- e) Write on soil solarization.

- Q.3 Answer the following questions. (Any Two) 06**
- a) What are insecticides?
  - b) What are bactericides?
  - c) Write on mycorrhizae.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Explain in brief crop rotation.
  - b) Crop dragging
  - c) Give the application of biofertilizer.
- 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 jawar.
  - b) Give the crop identification, soil type, tillage, seed rate & spacing intercultural operations, fertilizers, irrigation, intercropping, yield & economic importance of Grapevine.



- Q.3 Answer the following. (Any Two) 06**
- a) Nature of climatology
  - b) Structure of the mesosphere and stratosphere
  - c) Relationship between climatology and meteorology
- Q.4 Answer the following. (Any Two) 06**
- a) Primary circulation of atmosphere
  - b) Characteristics of trade winds
  - c) Impact of land-water distribution on general circulation
- Q.5 Answer the following. (Any One) 06**
- a) Give a detail note on tropical circulation.
- OR**
- b) Explain the composition of the atmosphere.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Physics - IV  
Python Programming (G04-DSC2-0302)**

Day & Date: Monday, 03-11-2025  
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) Python was developed by: \_\_\_\_\_.  
a) James Gosling                      b) Guido van Rossum  
c) Tim Berners-Lee                    d) Dennis Ritchie
- 2) Which of these is a membership operator?  
a) and                                      b) in  
c) not                                        d) or
- 3) Which statement is used to skip the current iteration in a loop?  
a) exit                                      b) skip  
c) continue                                d) break
- 4) Which method returns the number of elements in a list?  
a) size()                                    b) count()  
c) len()                                      d) length()
- 5) Which symbol is used for key-value separation in dictionaries?  
a) ,    b) :  
c) =    d) ->
- 6) Which module in Python provides access to date and time?  
a) math                                      b) datetime  
c) random                                  d) sys

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

**06**

- a) List two features of Python.
- b) Write the syntax to declare a tuple.
- c) What is the difference between local and global variables?
- d) Name two functions from the math module.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain precedence of operators with an example.
  - b) Explain any three string methods with examples.
  - c) Write a Python program to pick up the largest number from three numbers.
- Q.4 Answer the following (Any Two) 06**
- a) Explain the use of break and continue with examples.
  - b) Explain a Random Module with example.
  - c) Write a Python program to find square root of a number.
- Q.5 Answer the following (Any One) 06**
- a) Explain conditional statements in Python with syntax and examples.
  - b) Explain types of functions in Python with examples.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
General Chemistry - II  
General Analytical Chemistry (G04-DSC2-0304)**

Day & Date: Monday, 03-11-2025  
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.  
4) Use of log table and calculators is allowed.

**Q.1 Multiple Choice Question.****06**

- 1) Molarity is expressed as \_\_\_\_\_.
  - a) gm/Litre
  - b) Litre/mole
  - c) mole/ Litre
  - d) mole/1000 gm
- 2) The unit of dipole moment is \_\_\_\_\_.
  - a) Viscosity
  - b) fluidity
  - c) Parachor
  - d) coefficient of viscosity
- 3) In paper chromatography, the stationary phase is \_\_\_\_\_.
  - a) Paper
  - b) Water
  - c) Organic liquid
  - d) jar
- 4) \_\_\_\_\_ is the impure source of metals.
  - a) Slag
  - b) flux
  - c) Ore
  - d) mineral
- 5) In roasting, metal in the ore is converted into \_\_\_\_\_.
  - a) Halides
  - b) oxides
  - c) Sulphides
  - d) atomic state
- 6) Pulses are adulterated by colouring with \_\_\_\_\_.
  - a) Dyes
  - b) pigment
  - c) Water
  - d) alcohol

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

- a) Define normality and molarity.
- b) Explain the terms: polar and non-polar.
- c) What is the basic principle of paper chromatography?
- d) Give any two methods of food processing.
- e) Give two examples of phosphate ore.

- Q.3 Answer the following. (Any Two) 06**
- a) Mention different types of titrimetric analysis?
  - b) Distinction between Calcination and Roasting.
  - c) What is adulteration of milk? Discuss adulterants used in milk
- Q.4 Answer the following (Any Two) 06**
- a) Calculate molarity of water in pure water. (Given  $d = 1.0\text{g/mL}$ )
  - b) What is meant by  $R_f$  value? Describe the factors affecting  $R_f$  values of the solute.
  - c) Discuss different types of ores.
- Q.5 Answer the following (Any One) 06**
- a) Application of parachor in the determination of molecular structures of benzene and  $-\text{NO}_2$  group.
  - b) Comment on physical methods used for concentration of ore.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025  
Botany - IV  
Introduction to Plant Protection (G04-DSC2-0306)**

Day & Date: Monday, 03-11-2025  
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) All questions carry equal marks.

**Q.1 Rewrite the correct answer from the given alternative: 06**

- 1) \_\_\_\_\_ is the main aim of plant protection.
  - a) Protect crops from pest and disease
  - b) reduce crop yield.
  - c) Increase pest population
  - d) Encourage weed growth.
  
- 2) The soybean plant is originated \_\_\_\_\_ country.
 

a) America	b) Brazil
c) China	d) India
  
- 3) Protein percentage of soybean seed is \_\_\_\_\_ %
 

a) 40-42%	b) 15-20%
c) 30-50%	d) 60-75%
  
- 4) The grape plant planting standard space for Y trellis is \_\_\_\_\_.
 

a) 1.8mx3.0m	b) 4.5 mx 3.8m
c) 2mx 2m	d) 5m x 5m
  
- 5) Brinjal vegetable plant is belong the family \_\_\_\_\_.
 

a) Solanacea	b) Verbanaceae
c) Malvaceae	d) Fabiaceae
  
- 6) \_\_\_\_\_ part of a Rose plant is used for propogation.
 

a) Leaf	b) Root
c) Stem cutting	d) Seeds

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

- a) What is local name of the Rose?
- b) What is the significance of plant protection?
- c) What is bagging?
- d) what is dragging?
- e) Give the any two name of the biological pest.

- Q.3 Write Short note on the following: (Any Two) 06**
- a) Describe the tillage operations in fruits crops.
  - b) Describe the netting method in plant protection.
  - c) What is soil solarization?
- Q.4 Answer the following (Any Two) 06**
- a) Explain the physical method of soil solarization.
  - b) Give the uses of bactericides in crop plant.
  - c) Explain the intercultural operation in Rose.
- Q.5 Answer the following (Any One) 06**
- a) Give the crop identification, soil type, tillage and intercultural operations, yield, economic importance of Soyabean.
  - b) Give the crop identification of grape and explain important disease of grape management.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Zoology - IV  
Techniques in Biology (G04-DSC2-0308)**

Day & Date: Monday, 03-11-2025  
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 Question.**

**06**

- 1) What is the basic principle of a microscope?
  - a) Use of magnetic fields
  - b) Use of electromagnetic radiation
  - c) Magnification of small objects for better visualization
  - d) Use of heat energy
  
- 2) In paper chromatography, what serves as the stationary phase?
 

a) Water	b) Paper
c) The solvent	d) The sample
  
- 3) Which chemical is not used as a disinfectant?
 

a) Ethanol	b) Sodium hypochlorite
c) Glucose	d) Formaldehyde
  
- 4) Which technique is used for quantitative estimation of hemoglobin?
 

a) Chromatography	b) Centrifugation
c) Hemoglobinometers	d) Electrophoresis
  
- 5) A colorimeter measures: \_\_\_\_\_.
  - a) The pressure of a liquid
  - b) The intensity of color in a solution
  - c) The temperature of a solution
  - d) The weight of a sample
  
- 6) Electrophoresis separates molecules based on: \_\_\_\_\_.
 

a) Size and charge	b) Density only
c) Boiling point	d) Color

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

**06**

- a) Principle of hemocytometer.
- b) Pasteurization.
- c) Principle of Centrifugation.
- d) Principle of electrophoresis.
- e) Importance of Biological technique.

- Q.3 Answer the following. (Any Two) 06**
- a) Write Short note on application of Hemoglobinometer.
  - b) Principle of colourimeter.
  - c) Write note on Brief History of Microscope.
- Q.4 Answer the following (Any Two) 06**
- a) Write note on Chemical disinfectant.
  - b) Write note on Application on Centrifugation.
  - c) Write note on simple microscope.
- Q.5 Answer the following (Any One) 06**
- a) Write in details thin layer chromatography.
  - b) Write in details types of electrophoresis.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025  
Electronics - IV  
Analog Electronics (G04-DSC2-0310)**

Day & Date: Monday, 03-11-2025  
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. (MCQ)****06**

- 1) \_\_\_\_\_ material acts as conductor as well as insulator.
  - a) Silicon
  - b) Copper
  - c) Aluminium
  - d) Glass
  
- 2) \_\_\_\_\_ semiconductor is called as pure semiconductor.
  - a) Intrinsic
  - b) Extrinsic
  - c) N-type
  - d) P-type
  
- 3) The potential barrier of a silicon P-N junction diode is approximately \_\_\_\_\_.
  - a) 0.3 V
  - b) 0.7 V
  - c) 1.1 V
  - d) 2.2 V
  
- 4) In reverse bias, the current is mainly due to \_\_\_\_\_.
  - a) Majority carriers
  - b) Minority carriers
  - c) Both equally
  - d) Electrons only
  
- 5) The three terminals of BJT are \_\_\_\_\_.
  - a) Source, Drain, Gate
  - b) Anode, Cathode, Gate
  - c) Emitter, Base, Collector
  - d) Source, Base, Collector
  
- 6) Colour of LED depends on \_\_\_\_\_.
  - a) Voltage applied
  - b) Doping Material
  - c) Shape of LED
  - d) Current limiting Resistor

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

- a) Define Semiconductor and give two examples with its atomic Structure.
- b) What is the forbidden energy gap?
- c) Define static resistance of a diode.
- d) What is the function of a gate terminal in SCR?
- e) What is function of LDR?

- Q.3 Answer the following. (Any Two) 06**
- a) Explain intrinsic semiconductor with a neat diagram.
  - b) Explain reverse biasing of a P-N junction diode with energy band diagram.
  - c) Explain the construction of BJT.
- Q.4 Answer the following (Any Two) 06**
- a) Explain the working principle of SCR.
  - b) Explain the working of a photodiode.
  - c) Compare metals, semiconductors, and insulators.
- Q.5 Answer the following (Any One) 06**
- a) Describe working of Zener diode Reverse biasing with IV characteristics.
  - b) Describe Construction & working of UJT equivalent Circuit diagram.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025  
MICROBIOLOGY - IV  
Microbial Genetics (G04-DSC2-0312)**

Day & Date: Monday, 03-11-2025  
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) AUG, the initiation codon codes for \_\_\_\_\_ amino acid.
  - a) Methionine
  - b) Phenylalanine
  - c) Aspartic acid
  - d) Lysine
- 2) The method of DNA replication proposed by Meselson and Stahl is \_\_\_\_\_.
  - a) Conservative
  - b) Semi-conservative
  - c) Dispersive
  - d) Fragmentation
- 3) \_\_\_\_\_ result from insertions or deletions that disrupt the reading frame of genetic code.
  - a) Silent mutation
  - b) Nonsense mutation
  - c) Missense mutation
  - d) Frameshift mutation
- 4) In a double stranded DNA, the two strands are held together by \_\_\_\_\_.
  - a) Hydrogen bonds
  - b) Phosphodiester bonds
  - c) Covalent bonds
  - d) Ionic bonds
- 5) The principal enzyme for DNA replication is \_\_\_\_\_.
  - a) DNA ligase
  - b) DNA Helicase
  - c) DNA polymerase III
  - d) Hexokinase
- 6) Which of the following RNA is not required for the synthesis of protein?
  - a) siRNA
  - b) mRNA
  - c) tRNA
  - d) rRNA

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

- a) What is Okazaki fragment?
- b) Exonuclease.
- c) Define Phenotype.
- d) Define Genetic code.
- e) Define Muton.

- Q.3 Answer the following. (Any Two) 06**
- a) Draw a neat, labelled diagram of Watson and Crick's model of DNA.
  - b) Write short about translation process.
  - c) Describe Griffith's experiment to prove DNA as genetic material.
- Q.4 Answer the following (Any Two) 06**
- a) Write note on properties of genetic code.
  - b) Describe the isolation of mutants by replica plate technique.
  - c) Explain the basic concept of transcription.
- Q.5 Answer the following (Any One) 06**
- a) What are mutations and elaborate on types of mutations.
  - b) Enlist the various enzymes involved in replication and explain the mechanism of DNA replication.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
GEOGRAPHY - IV  
Geography of India - II (G04-DSC2-0314)**

Day & Date: Monday, 03-11-2025  
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 alternatives. (MCQ)****06**

- 1) \_\_\_\_\_ state has the highest population in India.
  - a) Maharashtra
  - b) Uttar Pradesh
  - c) West Bengal
  - d) Bihar
- 2) \_\_\_\_\_ Geographical feature is associated with a lower population density in India.
  - a) North Indian Plains
  - b) Coastal Plains
  - c) Himalayan region
  - d) River deltas
- 3) \_\_\_\_\_ State of India has highest sex ratio as per 2011 census
  - a) Maharashtra
  - b) Bihar
  - c) U.P
  - d) Kerala
- 4) \_\_\_\_\_ state in India is the leading producer of Iron ore.
  - a) Jharkhand
  - b) Karnataka
  - c) Chhattisgarh
  - d) Odisha
- 5) \_\_\_\_\_ state of India is leading to produce coal.
  - a) Jharkhand
  - b) Karnataka
  - c) Chhattisgarh
  - d) Odisha
- 6) Rice is \_\_\_\_\_ type of crop.
  - a) Rabi
  - b) Kharif
  - c) Zaid
  - d) All of the above

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

- a) Define the concept of Power Resources.
- b) Define the concept of Mineral Resources.
- c) Define the concept of industrial development.
- d) Define the concept of information technology.
- e) Define the concept of growth of population.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the Geographical factor affecting on distribution of population in India.
  - b) Explain the distribution of Iron ore of India.
  - c) Explain the production of petroleum of India.
- Q.4 Answer the following (Any Two) 06**
- a) Explain the production of sugarcane of India.
  - b) Explain the production of coal of India.
  - c) Explain the population distribution of India.
- Q.5 Answer the following (Any One) 06**
- a) Explain the age and sex composition of India.
  - b) Explain the distribution of coal in India.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
COMPUTER SCIENCE - IV  
PHP Programming (G04-DSC2-0316)**

Day & Date: Monday, 03-11-2025  
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. (MCQ)****06**

- 1) What is the default value of max\_input\_time directive?
  - a) 30 seconds
  - b) 60 seconds
  - c) 120 seconds
  - d) 1 second
  
- 2) What will be the output of the following PHP code?
  - 1) <?php
  - 2) \$fruits = array ("mango", "apple", "pear", "peach");
  - 3) \$fruits = array\_flip(\$fruits);
  - 4) echo (\$fruits[0]);
  - 5) ?>
  - a) mango
  - b) error
  - c) peach
  - d) 0
  
- 3) Which of the methods are used to manage result sets using both associative and indexed arrays?
  - a) get\_array() and get\_row()
  - b) get\_array() and get\_column()
  - c) fetch\_array() and fetch\_row()
  - d) mysqli\_fetch\_array() and mysqli\_fetch\_row()
  
- 4) Which of following is not a Superglobals in PHP?
  - a) \$\_SERVER
  - b) \$\_ENV
  - c) \$\_FILES
  - d) \$\_PUT
  
- 5) Which of the following variables is not a predefined variable in PHP?
  - a) \$get
  - b) \$post
  - c) \$request
  - d) \$ask
  
- 6) Which PHP function is used to find files?
  - a) file()
  - b) fold()
  - c) glob()
  - d) None of the above

- Q.2 Answer the following. (Any Three) 06**
- a) Explain Static website.
  - b) Include () function.
  - c) What is Variables in PHP?
  - d) Explain any four date and time function with example.
  - e) What is multidimensional array? Explain with example.
- Q.3 Answer the following. (Any Two) 06**
- a) Explain different forms controls, its properties, methods and events.
  - b) Write note on passing arguments to a function by reference.
  - c) What is array? Types of arrays with example.
- Q.4 Answer the following (Any Two) 06**
- a) What is Control statements in PHP.
  - b) Difference between Static website vs Dynamic website development.
  - c) Explain different sorting techniques of arrays with proper examples.
- Q.5 Answer the following (Any One) 06**
- a) Design web page which inserts, delete and update records.
  - b) What is Session? Explain session state management in detail.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025  
GEOLOGY - IV  
Elements of Rocks - II (Sedimentary Rocks) (G04-DSC2-0318)**

Day & Date: Monday, 03-11-2025  
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 net diagram wherever necessary.

**Q.1 Select correct one: -**

**06**

- 1) \_\_\_\_\_ is a residual sedimentary rock.
  - a) Sandstone
  - b) Limestone
  - c) Breccia
  - d) Laterite
  
- 2) Conglomerate contains \_\_\_\_\_ sediments.
  - a) Pebbles
  - b) Boulder
  - c) Cobble
  - d) All of these
  
- 3) Limestone formed by precipitation of \_\_\_\_\_.
  - a) Calcium carbonate
  - b) Iron
  - c) Magnesium sulphate
  - d) Manganese sulphate
  
- 4) In lithification, sediments were welded because of \_\_\_\_\_.
  - a) Cementation
  - b) Compaction
  - c) Transportation
  - d) Erosion
  
- 5) \_\_\_\_\_ contains fossils.
  - a) Sandstone
  - b) Limestone
  - c) Mud stone
  - d) Shelly limestone
  
- 6) \_\_\_\_\_ is the arenaceous sedimentary rock.
  - a) Shale
  - b) Limestone
  - c) Sandstone
  - d) Conglomerate

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

**06**

- a) Describe limestone.
- b) What is compaction?
- c) Describe the shale.
- d) Define sedimentary rock.
- e) Gives the size of different sediments.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain sandstone and greywacke
  - b) What is transportation of sediments?
  - c) What is Argillaceous rocks?
- Q.4 Answer the following (Any Two) 06**
- a) Describe the bedding and ripple mark structures in sedimentary rock.
  - b) Describe the texture in sedimentary rock
  - c) Describe the residual deposits of sedimentary rock.
- Q.5 Answer the following (Any One) 06**
- a) Describe the process of formation of sedimentary rock.
  - b) Describe chemical sedimentary rock.

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025  
STATISTICS – IV  
Introduction to Continuous Probability Distribution  
(G04-DSC2-0322)**

Day & Date: Monday, 03-11-2025  
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) A continuous random variable  $X$  with p.d.f.  $f(x)$  given by

$$f(x) = \begin{cases} kx & ; 0 < x < 1 \\ 0 & ; \text{otherwise} \end{cases}$$

Then  $k$  must be \_\_\_\_\_

- |      |                  |
|------|------------------|
| a) 1 | b) 2             |
| c) 0 | d) None of these |
- 2) If  $(X, Y)$  is a bivariate r.v. with joint p.d.f.
- $$f(x, y) = \begin{cases} 4xy & ; 0 < x < 1, 0 < y < 1 \\ 0 & ; \text{otherwise} \end{cases}$$
- then marginal p.d.f. of the r.v.  $Y$  is given by \_\_\_\_\_
- |         |         |
|---------|---------|
| a) $2x$ | b) $2y$ |
| c) $3x$ | d) $3y$ |
- 3) If  $X \sim U(3, 6)$ , then Variance of  $X$  is \_\_\_\_\_.
- |                  |                         |
|------------------|-------------------------|
| a) $\frac{3}{4}$ | b) $\frac{1}{2}$        |
| c) $\frac{9}{2}$ | d) $\frac{\sqrt{3}}{2}$ |
- 4) If  $X \sim \exp(\theta = 5)$ , then  $Var(X) =$  \_\_\_\_\_
- |                  |                   |
|------------------|-------------------|
| a) $\frac{1}{5}$ | b) $\frac{1}{25}$ |
| c) 5             | d) 25             |
- 5) If  $X$  is a gamma variate with parameters 0.5 and 1 then distribution of  $(0.5 X)$  is \_\_\_\_\_.
- |                 |                            |
|-----------------|----------------------------|
| a) $G(1, 1)$    | b) Exponential with mean 1 |
| c) both a and b | d) $G(0.5, 1)$             |



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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025  
ENVIRONMENTAL SCIENCE – IV  
Water and Land Resource Management (G04-DSC2-0324)**

Day & Date: Monday, 03-11-2025  
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. (MCQ)**

**06**

- 1) 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
  
- 2) Roof top rainwater harvesting is a technique to recharge: \_\_\_\_\_
  - a) River water
  - b) Ground water
  - c) Lake water
  - d) Ocean water
  
- 3) Where is most of the Earth water located \_\_\_\_\_.
  - a) Polar Icecaps
  - b) Ground water
  - c) Ocean
  - d) Atmosphere
  
- 4) Approximately what percentage of Earths water is salty?
  - a) 3%
  - b) 70%
  - c) 79%
  - d) 97%
  
- 5) What is deforestation?
  - a) Planting more trees
  - b) Cutting down and removal of forest
  - c) Creating a new forest
  - d) None of these
  
- 6) Soil erosion is cause due to:
  - a) Water
  - b) Wind
  - c) Deforestation
  - d) All of these

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

**06**

- a) Define Deforestation.
- b) State the sources of surface water pollution.
- c) Write a short note on watershed management.
- d) Define Desertification of the soil.
- e) Write a note on Environmental impact assessment for new project.

- Q.3 Answer the following. (Any Two) 06**
- a) Describe Types of water resources.
  - b) Write a note on distribution of water on Earth Surface.
  - c) Explain soil conservation techniques.
- Q.4 Answer the following (Any Two) 06**
- a) Describe Causes of soil erosion.
  - b) Explain causes for Desertification of soil.
  - c) Explain Rainwater harvesting system.
- Q.5 Answer the following (Any One) 06**
- a) Explain and draw hydrological cycle.
  - b) Describe the concept Environmental Impact Assessment (EIA) for land projects.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025  
BIOCHEMISTRY – II  
Biochemical Techniques (G04-DSC2-0326)**

Day & Date: Monday, 03-11-2025  
Time: 12:00 PM To 01:30 PM

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 Multiple choice questions.****06**

- 1) Which of the following is a tracking dye used in SDS PAGE?
  - a) Ethidium bromide
  - b) Acridine orange
  - c) Bromophenol blue
  - d) Methyl red
- 2) In normal phase chromatography the mobile phase is \_\_\_\_\_.
  - a) Apolar
  - b) Bipolar
  - c) Nonpolar
  - d) Polar
- 3) The wavelength 200 to 400 nm of an electromagnetic spectrum corresponds to the \_\_\_\_\_ light.
  - a) UV
  - b) Visible
  - c) IR
  - d) Polarized
- 4) The \_\_\_\_\_ blotting technique is used in DNA fingerprinting.
  - a) Southern
  - b) Northern
  - c) Western
  - d) Eastern
- 5) Which of the following is an example of Bioinformatics DATA retrieval tool?
  - a) BLAST
  - b) FASTA
  - c) Entrez
  - d) ClustalW
- 6) Estimation of protein can be done by using its maximum absorbance at \_\_\_\_\_ nm.
  - a) 420
  - b) 280
  - c) 730
  - d) 540

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

- a) What is the difference between native and SDS PAGE?
- b) What are different types of chromatography?
- c) Write names of modern biochemical techniques.
- d) What is NCBI? Where is it located?
- e) Which stains are used for visualizing bands of DNA and protein after electrophoresis.

- Q.3 Answer the following. (Any Two) 06**
- a) Explain the preparation of Polyacrylamide Gel for electrophoresis.
  - b) What are the advantages of spectrophotometer over colorimeter?
  - c) Explain the principle of estimation of protein by Lowry assay.
- Q.4 Answer the following (Any Two) 06**
- a) Describe the factors affecting electrophoretic mobility.
  - b) Give different applications of bioinformatics.
  - c) Write a note on instrumentation of HPLC.
- Q.5 Answer the following (Any One) 06**
- a) Describe the technique and applications of ELISA.
  - b) Describe the technique and applications of PCR.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025**

**GEOCHEMISTRY**

**Introduction to Solar system and Geo-sphere (G04-DSC2-0328)**

Day & Date: Monday, 03-11-2025  
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.  
(At. Wts.: H=1, C=12, O=16, N= 14, Na = 23, Cl = 35.5)

**Q.1 Multiple choice questions.**

**06**

- 1) In the primeval atmosphere, at the first stage of its evolution \_\_\_\_\_ was major constituent.
 

a) CH <sub>4</sub>	b) N <sub>2</sub>
c) O <sub>2</sub>	d) None of the these
  
- 2) Which of the following is incorrect pair:
 

a) Siderophile-Silicates	b) Chalcophile-Sulfides
c) Lithophile-Silicate	d) Atmosphile- Atmosphere
  
- 3) The average composition of terrestrial water is \_\_\_\_\_.
 

a) Na > Ca > Mg	b) Ca > Na > Mg
c) Mg > Na > Ca	d) Ca > Mg > Na
  
- 4) The upper crust of the earth mainly consists of \_\_\_\_\_.
  - a) Sandstone
  - b) Shale
  - c) Limestone
  - d) Igneous and metamorphic rocks
  
- 5) Which one of the following meteorites is known as siderites?
 

a) Iron meteorites	b) Iron-stony meteorites
c) Stony meteorites	d) Metallic meteorites
  
- 6) Elements which readily-form ions with an outermost 8-electron shell are: \_\_\_\_\_.
 

a) Siderophile	b) Chalcophile
c) Lithophile	d) Atmosphile

- Q.2 Answer the following. (Any Three) 06**
- a) What is the composition of troilite?
  - b) Name the two types of Siderolite.
  - c) Names of variable constituents of the atmosphere.
  - d) Which element having affinity towards metallic iron?
  - e) Define Pyrolite.
- Q.3 Answer the following. (Any Two) 06**
- a) Write short note on Salinity and chlorinity of oceanic water.
  - b) Discuss the structure of atmosphere with diagram.
  - c) Describe in brief cosmic abundance of elements.
- Q.4 Answer the following (Any Two) 06**
- a) Explain in short the zonal structure of the earth.
  - b) Describe in brief the geochemical classification of elements.
  - c) Describe the composition of Sun and Planets.
- Q.5 Answer the following (Any One) 06**
- a) Describe in detail the composition of Meteorites and its types.
  - b) Describe the evolution of the atmosphere. Add note on the composition of the primeval atmosphere.



- Q.3 Answer the following. (Any Two) 06**
- a) Control measures of Downy mildew of Grapes.
  - b) Kitch 's Postulates.
  - c) Methods of inoculation.
- Q.4 Answer the following (Any Two) 06**
- a) Give an account on classification of plant diseases.
  - b) Write the control measures on viral diseases.
  - c) Describe the Little leaf of Brinjal.
- Q.5 Answer the following (Any One) 06**
- a) Describe in details about Grain smut of Jawar.
  - b) Write on Citrus canker disease.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025  
Meteorology  
General Meteorology (G04-DSC2-0332)**

Day & Date: Monday, 03-11-2025  
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. (MCQ) 06**

- 1) Which of the following effects does not occur due to scattering of sunlight?
  - a) blue appearance of sky
  - b) red appearance of sun at sunrise
  - c) red appearance of sun at sunset
  - d) white appearance of sun at noon
  
- 2) Which of the following phenomena does not occur in the Earth's atmosphere?
 

a) reflection	b) polarization
c) absorption	d) scattering
  
- 3) In diffused reflection, if the angle of incidence is 30 degrees, then the angle of reflection must be \_\_\_\_\_ degrees.
 

a) 30	b) 15
c) 45	d) 90
  
- 4) Which of the following does not represent a gradient?
 

a) $\frac{dp}{dx}$	b) $\frac{dv}{dr}$
c) $\frac{dp}{dz}$	d) $\frac{d\phi}{dt}$
  
- 5) By Buys Ballots law, in the northern hemisphere \_\_\_\_\_ pressure is to the \_\_\_\_\_ of an observer looking downwind.
 

a) high, left	b) low, right
c) low, left	d) low, top
  
- 6) Which of the following is a pseudo force?
 

a) Coriolis	b) Gravitational
c) frictional	d) pressure gradient force

- Q.2 Answer the following. (Any Three) 06**
- a) The distance between the Sun and the Earth is 15 crore kilometres. Calculate the time required to travel this distance if speed of light is  $3 \times 10^{08} \text{ m/s}$ .
  - b) What is Rayleigh's scattering.
  - c) How does reflection of light occur in the Earth's atmosphere?
  - d) Two locations having pressures 2 mb and 8 mb are separated by 200 m. Calculate pressure gradient between these locations.
  - e) What is non-inertial frame of reference?
- Q.3 Answer the following. (Any Two) 06**
- a) What are effects of scattering of light in the Earth's atmosphere?
  - b) Write a note on greenhouse effect.
  - c) Discuss non-inertial frame of reference and pseudo forces.
- Q.4 Answer the following (Any Two) 06**
- a) Write a note on 'Tephigram.'
  - b) State and explain Buys Ballot's law.
  - c) Write a note on Local winds.
- 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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**B.Sc. (Plain) (सत्र - III) (नवीन) (NEP CBCS) परीक्षा: ऑक्टोबर / नोव्हेंबर –  
२०२५  
Co-Curricular Course  
National Service Scheme (G04-CC-301)**

वार, दिनांक: मंगळवार, ०४-११-२०२५

कमाल गुण: ३०

वेळ: दुपारी १२:०० ते ०१:३०

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

प्र.१ खालील दिलेले योग्य पर्याय निवडून गाळलेल्या जागा भरा. ०६

- १) ——— हा राष्ट्रीय सेवा योजनेचा केंद्रबिंदू असतो.  
अ) प्राचार्य ब) स्वयंसेवक  
क) कार्यक्रम अधिकारी ड) मुख्याध्यापक
- २) ——— म्हणजे व्यक्ती किंवा गटांना समान उद्दिष्टे साध्य करण्यासाठी मार्गदर्शन करण्याची, आणि प्रेरित करण्याची क्षमता होय.  
अ) नेतृत्व ब) प्रशिक्षण  
क) नियोजन ड) मुलाखत
- ३) ——— यामध्ये एक पद्धतशीर प्रक्रिया समाविष्ट असते. ज्यामुळे ती इच्छित माहिती प्रभावीपणे गोळा करते.  
अ) प्रश्नावली ब) प्रशिक्षण  
क) नियोजन ड) मुलाखत
- ४) भारतात दर ——— वर्षांनी जनगणना केली जाते.  
अ) १२ ब) १०  
क) ०५ ड) ०८
- ५) संवाद कौशल्याचे मुख्य प्रकार मौखिक, अशाब्दिक, लेखी आणि ——— अशा चार प्रकारांमध्ये विभागले गेले आहेत.  
अ) अदृश्य ब) अलेखी  
क) दृश्य ड) अमौखिक

- ६) ——— चे मुख्य काम म्हणजे भारतातील सामाजिक-आर्थिक सर्वेक्षणे करणे आणि विविध क्षेत्रांतील आकडेवारी गोळा करणे.
- अ) राष्ट्रीय नमुना सर्वेक्षण संघटना  
ब) राष्ट्रीय कुटुंब आरोग्य सर्वेक्षण  
क) सामाजिक-आर्थिक सर्वेक्षण  
ड) जनगणना

- प्र.२ खालील प्रश्नांची उत्तरे लिहा. (कोणतेही दोन) ०६
- अ) स्वयंसेवकाची संकल्पना लिहा.  
ब) धोरणात्मक नियोजनाची वैशिष्ट्ये सांगा.  
क) सामाजिक-आर्थिक सर्वेक्षणाची गरज लिहा.  
ड) राष्ट्रीय कुटुंब आरोग्यसर्वेक्षणाचे उद्देश सांगा.
- प्र.३ खालील प्रश्नाचे उत्तर लिहा. (कोणताही एक) ०६
- अ) भारतातील स्वयंसेवकाची आदर्श भूमिका लिहा.  
ब) सामाजिक – आर्थिक सर्वेक्षणाची प्रक्रिया लिहा.
- प्र.४ खालील प्रश्नाचे सविस्तर उत्तर लिहा. (कोणताही एक) १२
- अ) संवाद कौशल्येचे प्रकार स्पष्ट करा.  
ब) राष्ट्रीय नमुना सर्वेक्षण संघटना यावर चर्चा करा.

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**B.Sc. (Plain) (Semester-III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Co-Curricular Course  
National Service Scheme (G04-CC-301)**

Day & Date: Tuesday, 04-11-2025  
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) \_\_\_\_\_ is the focus of N.S.S..
 

a) Principal	b) Volunteers
c) Programme Officer	d) Headmaster
  
- 2) \_\_\_\_\_ means the ability to guide, inspire, and motivate individuals or groups to achieve common goals.
 

a) Leadership	b) Training
c) Planning	d) Interview
  
- 3) \_\_\_\_\_ it involves a systematic process that effectively collects the desired information.
 

a) Questionnaire	b) Training
c) Planning	d) Interview
  
- 4) Census is conducted in India every \_\_\_\_\_ year.
 

a) 12	b) 10
c) 05	d) 08
  
- 5) The main types of communication skills are divided into four categories: verbal, nonverbal, written, and \_\_\_\_\_.
 

a) Invisible	b) Non-written
c) Visual	d) Non-verbal
  
- 6) \_\_\_\_\_ is main work to conduct socio-economic surveys in India and collect statistics in various sectors.
 

a) National Sample Survey Organization
b) National Family Health Survey
c) Socio-Economic Survey
d) Census

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

**06**

- a) Write the Concept of Volunteerism.
- b) State the characteristics of Strategic planning.
- c) Write the Need of Social- Economics survey.
- d) State the Objective of National Family Health Survey.

- Q.3 Write Short answer to questions. (Any One)** **06**
- a) Write the Role Models of Volunteerism in India.
  - b) Write the Process of Social- Economics survey.
- Q.4 Broad Question. (Any One)** **12**
- a) Explain the type of Communication Skills.
  - b) Discuss the National Sample Survey Organization.

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**B.Sc. (Plain) (सत्र - III) (नवीन) (NEP CBCS) परीक्षा:**  
**ऑक्टोबर / नोव्हेंबर - २०२५**  
**Co-Curricular Course**  
**National Cadet Corps (G04-CC-302)**

वार, दिनांक: मंगळवार, ०४-११-२०२५  
 वेळ: दुपारी १२:०० ते ०१:००

कमाल गुण: १५

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

- प्र.१ योग्य पर्याय निवडा. ०४**
- १) ——— हे नविन निर्माण झालेले एन्. सी. सी. डायरेक्टरेट आहे.  
 अ) उत्तरांचल                      ब) महाराष्ट्र  
 क) राजस्थान                      ड) यापैकी एकही नाही
- २) 'जय जवान, जय किसान' घोषणा ——— यांनी दिली.  
 अ) जवाहरलाल नेहरू                      ब) लाल बहादूर शास्त्री  
 क) महात्मा गांधी                      ड) यापैकी एकही नाही
- ३) वृक्षारोपण हा ——— चा एक भाग आहे.  
 अ) ड्रिल                      ब) वेपन ट्रेनिंग  
 क) समाजसेवा                      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) रक्तदानासाठी आवश्यक असणारी पात्रता लिहा.  
 ब) समाजसेवेची उद्देश लिहा.  
 क) एन्. सी. सी. मधील कॅम्पची नावे लिहा.
- प्र.३ टिप लिहा. ०३**  
 एन्. सी. सी. मध्ये केली जाणारी समाजसेवेची कामे.
- प्र.४ नेतृत्वाचे मूलभूत गुणसविस्तर लिहा. ०४**

किंवा

आदर्श नागरिकाची कर्तव्ये आणि अधिकार सविस्तर लिहा.

<b>Seat No.</b>	
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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November – 2025  
Co-Curricular Course  
National Cadet Corps (G04-CC-302)**

Day & Date: Tuesday, 04-11-2025  
Time: 12:00 PM To 01:00 PM

Max. Marks: 15

**Instructions:** 1) All questions are compulsory.  
2) Right side number indicates marks.

**Q.1 Multiple choice questions. 04**

- 1) \_\_\_\_\_ is a newly raised N.C.C. directorate.
  - a) Uttaranchal
  - b) Maharashtra
  - c) Rajasthan
  - d) None of these
- 2) \_\_\_\_\_ gave the slogan, 'Jai Jawan, Jai Kisan'.
  - a) Jawaharlal Nehru
  - b) Lal Bahadur Shastri
  - c) Mahatma Gandhi
  - d) None of these
- 3) Tree plantation is a part of \_\_\_\_\_.
  - a) drill
  - b) weapon training
  - c) social service
  - d) None of these
- 4) There are \_\_\_\_\_ NCC directorates in India.
  - a) 14
  - b) 15
  - c) 16
  - d) 17

**Q.2 Short Answer Type Question. (Any Two) 04**

- a) Write down the eligibility conditions for blood donation.
- b) Write down the aims of social service.
- c) Write down the names of camps in NCC.

**Q.3 Write a short note. 03**

Social service activities done in N.C.C

**Q.4 Describe the basic leadership traits. 04**

**OR**

Describe the duties & rights of an ideal citizen.



Seat No.	
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Set	P
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**B.Sc. (Plain) (Semester-III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Co-Curricular Course  
Sports (G04-CC-303)**

Day & Date: Tuesday, 04-11-2025  
Time: 12:00 PM To 01:00 PM

Max. Marks: 15

**Instructions:** 1) All questions are compulsory.  
2) Right side number indicates marks.

**Q.1 Multiple choice questions. 04**

- 1) The first modern Olympic Games were held in \_\_\_\_\_.
  - a) Paris
  - b) Greece
  - c) Rome
  - d) London
- 2) The shot-put is \_\_\_\_\_ k.g. for men.
  - a) 7.26
  - b) 5
  - c) 8.26
  - d) 4
- 3) The Olympic flag has \_\_\_\_\_ circles.
  - a) Three
  - b) Four
  - c) Five
  - d) Six
- 4) Hurdles for men is a competition of \_\_\_\_\_ meters.
  - a) 100
  - b) 110
  - c) 120
  - d) 130

**Q.2 Short Notes. (Any Three) 06**

- a) Olympic flag
- b) International Olympic Committee
- c) Long jump
- d) Olympic flame/Torch

**Q.3 Write the detail answer (any one) 05**

- a) What is Track event? Write main types of Track event.
- b) Explain shot-put.



प्र.३ दीर्घ उत्तर लिहा. (कोणताही एक)

०५

अ) निरोगीपणाचे घटक स्पष्ट करा.

ब) दुखापती टाळण्यासाठी कोणते प्रतिबंधात्मक उपाय आहेत ते स्पष्ट करा.

Seat No.	
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Set	P
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**B.Sc. (Plain) (Semester-III) (New) (NEP CBCS) Examination:  
October/November – 2025  
Co-Curricular Course  
Health, Wellness and Fitness (G04-CC-304)**

Day & Date: Tuesday, 04-11-2025  
Time: 12:00 PM To 01:00 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 full integration of states of physical, mental, and spiritual well-being.
 

a) Fitness	b) Wellness
c) Training	d) None of above
  
- 2) There are \_\_\_\_\_ Forms of injuries, as per nature.
 

a) Two	b) One
c) Three	d) Five
  
- 3) \_\_\_\_\_ is an emergency lifesaving method.
 

a) HWR	b) VSR
c) ARR	d) CPR
  
- 4) \_\_\_\_\_ wellness, also known as intellectual wellness.
 

a) Emotional	b) Physical
c) Mental	d) Social

**Q.2 Write short notes. (Any Three) 06**

- a) Write about any two mobile fitness application.
- b) Explain first aids
- c) Explain the basic rule of meditation?
- d) List the common injuries doing exercise?
- e) Explain Key Aspects of Mental Health.

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

- a) Explain Components of wellness.
- b) What are the preventive measures for avoid injuries? Explain it.

Seat No.	
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Set P

**B.Sc. (Plain) (सत्र - III) (नवीन) (NEP CBCS) परीक्षा:**  
**ऑक्टोबर / नोव्हेंबर – २०२५**  
**Co-Curricular Course**  
**Yoga Education (G04-CC-305)**

वार, दिनांक: मंगळवार, ०४-११-२०२५  
वेळ: दुपारी १२:०० ते ०१:००

कमाल गुण: १५

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

प्र.१ योग्य पर्याय निवडा.

०४

- १) योगाचा मुख्य उद्देश काय आहे.
  - अ) शरीर सोष्टव
  - ब) लवचिकता
  - क) शरीर मन आणि आत्म्याचा मिलन
  - ड) स्पर्धात्मक यश
- २) ध्यान या शब्दाचा अर्थ काय.
  - अ) शिस्त
  - ब) शारीरिक स्थिती
  - क) एकाग्रता
  - ड) ध्यान धारणा
- ३) आंतरराष्ट्रीय योग दिन कधी साजरा केला जातो.
  - अ) १ जून
  - ब) १० जून
  - क) २१ जून
  - ड) २१ जुलै
- ४) योग सूत्रांचे संकलक कोण आहे.
  - अ) व्यास
  - ब) पतंजली
  - क) कपिला
  - ड) चरक

प्र.२ टीपा लिहा. (कोणत्याही तीन)

०६

- अ) तणाव व्यवस्थापनात योगाची भूमिका.
- ब) योगा विषयीचे गैरसमज स्पष्ट करा.
- क) योगा संपूर्ण आरोग्यास कसा हातभार लावतो याबद्दल माहिती द्या.
- ड) योगासनाचे महत्त्व
- इ) योगा मानसिक आरोग्य सुधारण्यात कसा मदत करतो हे स्पष्ट करा.

प्र.३ खालील प्रश्नांची सविस्तर उत्तरे लिहा. (कोणतेही एक)

०५

अ) योगाची भूमिका—आंतरराष्ट्रीय योग दिन सविस्तरणे स्पष्ट करा.

ब) योगाचा शारीरिक आरोग्यावर होणारा परिणाम स्पष्ट करा.

Seat No.	
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Set	P
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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Co-Curricular Course  
Yoga Education (G04-CC-305)**

Day & Date: Tuesday, 04-11-2025  
Time: 12:00 PM To 01:00 PM

Max. Marks: 15

**Instructions:** 1) All questions are compulsory.  
2) Right side number indicates marks.

**Q.1 Multiple choice questions. 04**

- 1) What is the main aim of yoga
  - a) Bodybuilding
  - b) Flexibility
  - c) Union of body mind and soul
  - d) Competitive success
  
- 2) What is the meaning of dhyana in Yoga.
 

a) Discipline	b) Posture
c) Concentration	d) Meditation
  
- 3) International Day of yoga is celebrated on
 

a) 1 June	b) 10 June
c) 21 June	d) 21 July
  
- 4) Who is the compiler of yoga sutras
 

a) Vyasa	b) Patanjali
c) Kapila	d) Charaka

**Q.2 Short Notes. (Any Three) 06**

- a) Role of yoga in stress management
- b) Misconceptions about yoga
- c) How does yoga contribute to overall well being
- d) Importance of yogasana
- e) How does yoga help in improving mental health

**Q.3 Write the detail answer (Any One) 05**

- a) Role of yoga - International Yoga Day explain in detail.
- b) Explain the impact of yoga on physical health

Seat No.	
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Set P

**B.Sc. (Plain) (सत्र - III) (नवीन) (NEP CBCS) परीक्षा:**  
**ऑक्टोबर / नोव्हेंबर - २०२५**  
**Cultural (G04-CC-306)**

वार, दिनांक: मंगळवार, ०४-११-२०२५  
वेळ: दुपारी १२:०० ते ०१:३०

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) गायन हा ---- या ललित कलेशी संबंधित कला प्रकार आहे.  
अ) नाट्य ब) साहित्य  
क) चित्रकला ड) संगीत
- २) खालील ---- हा ग्रंथ नाट्य या ललित कलेशी संबंधित आहे.  
अ) चरक संहिता ब) नाट्यशास्त्र  
क) गीता ड) महाभारत
- ३) दृश्यकला यामध्ये खालील कलेचा प्रामुख्याने समावेश करता येईल.  
अ) नाट्य ब) साहित्य  
क) चित्रकला ड) संगीत
- ४) बालवयात ---- या ललित कलेचे संस्कार मानसिक आरोग्य चांगले राखण्यास मदत करतात.  
अ) संगीत ब) शिल्पकला  
क) मातीकाम ड) खेळ
- ५) ---- हे सोलापूर जिल्यातील भारतीय चित्रकलेतील जगप्रसिद्ध व्यक्तिमत्व आहे.  
अ) अजय गोगावले ब) एम. एफ. हुसेन  
क) श्रेया घोषाल ड) जाकिर हुसेन
- ६) ---- हे प्रसिद्ध भारतीय वाद्य आहे.  
अ) तबला ब) गिटार  
क) पियानो ड) तावील

- प्र.२ खालील प्रश्नांची थोडक्यात उत्तरे लिहा. (कोणतेही तीन) 0६
- अ) ललितकलांमध्ये येणाऱ्या चार कलांची नावे सांगा?  
ब) संगीतातील चार प्रसिद्ध कलाकारांची नावे लिहा.  
क) शिल्पकला म्हणजे काय थोडक्यात लिहा?  
ड) मुकनाट्य म्हणजे काय? संकल्पना स्पष्ट करा.
- प्र.३ टिप्पणी लिहा. 0६
- पथनाट्य म्हणजे काय सांगून त्याचे समाजातील महत्व स्पष्ट करा.
- प्र.४ खालील प्रश्नाचे सविस्तर उत्तर लिहा. (कोणताही एक) १२
- अ) अभिनयाची संकल्पना स्पष्ट करा.  
किंवा  
ब) ललितकलांची संकल्पना प्रकार आणि महत्व स्पष्ट करा.



**Q.4 Answer the following question. (Any One)**

**12**

- a)** Explain the concept of acting
- b)** Explain the concept, types and importance of fine arts.

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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
Chemistry - IV  
Pharmaceutical and Fine Chemicals - I  
(G19-DSC1-0302) / (G19-DSC1-0328)**

Day &amp; Date: Friday, 31-10-2025

Max. Marks: 30

Time: 12:00 PM To 01:30 PM

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

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

- 1) Elixirs are \_\_\_\_\_.
  - a) Hydroalcoholic liquid
  - b) Aqueous
  - c) Viscous
  - d) Semi solid
  
- 2) \_\_\_\_\_ is a parenteral route of administration.
  - a) Oral
  - b) Rectal
  - c) Intravenous
  - d) Topical
  
- 3) \_\_\_\_\_ is a characteristic of a heavy chemical.
  - a) High purity and small quantities
  - b) Produced in large volumes for bulk preparations
  - c) Used in specialized applications like pharmaceuticals
  - d) Complex molecular structure
  
- 4) \_\_\_\_\_ distinguishes a fine chemical from a heavy chemical.
  - a) The source material
  - b) Production quantity and application
  - c) The chemical's physical state
  - d) The type of reaction used to make it
  
- 5) \_\_\_\_\_ technique used in the standardization and quality control of herbal drugs to verify identity and potency.
  - a) Maceration
  - b) Extraction of essential oils
  - c) Fermentation
  - d) Marker compound analysis
  
- 6) Pharmacological screening helps to \_\_\_\_\_.
  - a) To evaluate the efficacy and safety
  - b) To determine chemical structure
  - c) To identify the plant species
  - d) To assess the geographical origin

- Q.2 Answer the following questions. (Any Three) 06**
- a) Define:
    - i) Drug
    - ii) Prodrug
  - b) Enlist different reactions involved in phase I of metabolism.
  - c) Give any two names of fine chemicals manufacturing Indian companies.
  - d) Enlist challenges involved pharmacological screening of herbal drugs.
  - e) Enlist any two in-vivo evaluation techniques for antiulcer activity.
- Q.3 Answer the following questions. (Any Two) 06**
- a) Explain in detail different routes of administration.
  - b) Give different organic and inorganic chemicals.
  - c) Explain evaluation of herbal drugs for antidiabetic.
- Q.4 Answer the following questions. (Any Two) 06**
- a) Describe different pharmacokinetic processes.
  - b) Explain different forms of fine chemicals.
  - c) Explain evaluation of herbal drugs for hepatoprotective.
- Q.5 Answer the following questions. (Any One) 06**
- a) Explain in detail different classes of dosage forms.
  - b) Explain the need for pharmacological screening of herbal drugs.

Seat  
No.Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
CHEMISTRY - IV  
(Introduction to paint and polymer technology)  
(G18-DSC1-0302)/(G19-DSC1-0326)**

Day & Date: Friday, 31-10-2025  
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 the main by-product of oil refining?
  - a) Glycerol
  - b) Water
  - c) Alcohol
  - d) Methane
- 2) Linoleic acid is classified as: \_\_\_\_\_.
  - a) Saturated fatty acid
  - b) Monounsaturated fatty acid
  - c) Polyunsaturated fatty acid
  - d) Trans-fat
- 3) The drying property of an oil depends on: \_\_\_\_\_.
  - a) Melting point
  - b) Iodine value
  - c) Boiling point
  - d) Density
- 4) Which one of the following oils is non-drying?
  - a) Soybean oil
  - b) Castor oil
  - c) Sunflower oil
  - d) Poppy seed oil
- 5) Which of these is a copolymer?
  - a) Nylon-6
  - b) Teflon
  - c) Nylon-6,6
  - d) Polyethylene
- 6) Which technique is best suited for water-based polymerization?
  - a) Bulk
  - b) Solution
  - c) Suspension
  - d) Emulsion

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

- a) What are monomers and polymers? Give examples.
- b) What are the physicochemical characteristics of oils?
- c) Differentiate between drying oils and non-drying oils.
- d) List any four characteristics of polymers.
- e) Define oils and mention their main sources.

- Q.3 Answer the following. (Any Two) 06**
- a) Define and compare thermoplastics and thermosetting polymers
  - b) What are drying oils? Explain their sources, uses, and composition.
  - c) Define polymer and give two examples each of natural and synthetic polymers.
- Q.4 Answer the following (Any Two) 06**
- a) Describe the emulsion and solution polymerization techniques.
  - b) Explain the solvent Extraction Method and the Mechanical Extraction Method.
  - c) Explain the terms: Addition Polymerization.
- Q.5 Answer the following (Any One) 06**
- a) Define the terms:
    - i) Degree of polymerization
    - ii) Functionality
    - iii) Oligomers
  - b) Describe the working principle of a screw press Extractor. Illustrate the working mechanism with a labelled diagram.

Seat No.	
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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
General Chemistry-II (General Paint Chemistry) (G18-DSC2-0304)**

Day & Date: Saturday, 01-11-2025  
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) Which of the following are physical properties used to test pigments?
  - a) Specific gravity
  - b) Tinting strength
  - c) Reducing power
  - d) Molecular weight
  
- 2) Which of the following terms are types of colorants?
  - a) Dyes
  - b) Toners
  - c) Pigments
  - d) Detergents
  
- 3) Organic pigments are typically not characterized by: \_\_\_\_\_.
  - a) High colour strength
  - b) High heat resistance
  - c) Bright shades
  - d) Poor lightfastness
  
- 4) Which of the following are incorrect differences between pigments and dyes?
  - a) Dyes are soluble; pigments are not
  - b) Pigments require a binder
  - c) Dyes are used in paints
  - d) Pigments have better lightfastness than dyes
  
- 5) The most widely used white pigment is: \_\_\_\_\_.
  - a) Zinc oxide
  - b) Titanium dioxide
  - c) Lithopone
  - d) Zinc sulphate
  
- 6) Lithopone is a mixture of: \_\_\_\_\_.
  - a) Zinc oxide and lead chromate
  - b) Zinc oxide and titanium dioxide
  - c) Zinc sulphide and barium sulphide
  - d) Lead oxide and chromium oxide

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

- a) Define white pigment and give two examples.
- b) Differentiate between natural and synthetic iron oxide pigments.
- c) Name any three tests used for pigment evaluation.
- d) What is meant by the phenomenon of colour in pigments?
- e) Define pigment and distinguish it from dye.

- Q.3 Answer the following. (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:
    - 1) Hansa yellows
    - 2) Rubine and Para reds
    - 3) Toluidine pigments
- Q.4 Answer the following (Any Two) 06**
- a) Define fluorescent and phosphorescent pigments with example
  - b) List any two anticorrosive pigments and their applications.
  - c) What is meant by lightfastness in pigment testing?
- Q.5 Answer the following (Any One) 06**
- a) Describe the testing parameters used for evaluating pigments, including: Oil absorption, Bulking value, Specific gravity, Tinting strength, Heat resistance.
  - b) Explain the classification of inorganic color pigments with examples (iron oxide, lead chromate, cadmium pigments, etc).

Seat No.	
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Set **P**

**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
General Chemistry - II  
General Pharmaceutical Chemistry  
(G19-DSC2-0304)/(G19-DSC2-0336)**

Day & Date: Monday, 03-11-2025  
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. (MCQ)**

**06**

- 1) \_\_\_\_\_ is a physical hazard.
  - a) Falls
  - b) Electricity
  - c) Inhalation
  - d) Both a and b
- 2) Repetitive motions in the workplace can lead to \_\_\_\_\_ type of ergonomic hazard.
  - a) Noise induced hearing loss
  - b) Heat stress
  - c) Musculoskeletal disorders (MSDs)
  - d) Radiation exposure
- 3) \_\_\_\_\_ is the classification of diazepam.
  - a) Anti-helminthic
  - b) Anti-Tubercular
  - c) Benzodiazepine
  - d) Azole antifungal
- 4) Miconazole is used to treat \_\_\_\_\_ type of infection.
  - a) Bacterial
  - b) Viral
  - c) Fungal
  - d) Parasitic
- 5) \_\_\_\_\_ titration involves a reaction between an oxidizing and a reducing agent.
  - a) Acid-base titrations
  - b) Complexometric titration
  - c) Redox titration
  - d) Precipitation titration
- 6) \_\_\_\_\_ is the purpose of an indicator in a titration.
  - a) To increase the reaction rate
  - b) To act as a catalyst
  - c) To signal the end point of the reaction through a colour change
  - d) To determine the concentration of the titrant

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

- a) Write a note on storage of hazardous chemicals.
- b) Write a note on occupational health hazards.
- c) Describe in brief on how toxicants enter and eliminate from the body.
- d) Give formulas for:
  - i) Density
  - ii) Specific gravity
- e) Give uses of:
  - i) Mebendazole
  - ii) Epichlorohydrin

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

- a) Explain in detail synthesis of p-Acetyl amino benzene sulphonyl chloride from Aniline.
- b) Explain differences between fire and explosions.
- c) Define:
  - i) Molarity
  - ii) Molality
  - iii) Normality

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

- a) Write a note on industrial hygiene.
- b) Define:
  - i) Standard Solution
  - ii) Primary standard
  - iii) Secondary standard
- c) Explain in detail synthesis of Ethambutol.

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

- a) Explain in detail classification of titrimetric analysis.
- b) Explain in detail synthesis of Diazepam and give its uses.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November - 2025  
Data Science  
Introduction to DBMS (G04-0113)**

Day & Date: Thursday, 20-11-2025  
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) \_\_\_\_\_ data model that uses a collection of tables to represent data is.
  - a) Hierarchical
  - b) Network
  - c) Object-oriented
  - d) none of these
- 2) A relation in a relational model is represented by \_\_\_\_\_.
  - a) Row
  - b) Column
  - c) Table
  - d) Attribute
- 3) An attribute is represented by \_\_\_\_\_.
  - a) Line
  - b) rectangle
  - c) Diamond
  - d) Ellipse
- 4) The 'A' in ACID stands for \_\_\_\_\_.
  - a) Atomicity
  - b) accurate
  - c) auto
  - d) constituency
- 5) 1NF (First Normal Form) \_\_\_\_\_.
  - a) Remove repeating groups
  - b) Remove partial dependency
  - c) Remove transitive dependency
  - d) none of the above
- 6) The relational algebra operation used to choose specific columns is \_\_\_\_\_.
  - a) DIFFERENCE
  - b) SELECT
  - c) INTERSECTION
  - d) PROJECT

- Q.2 Answer the following. (Any Three) 06**
- a) What is primary index?
  - b) Define Entity.
  - c) List out different data independence.
  - d) What is functional dependency?
  - e) What is BCNF?
- Q.3 Answer the following. (Any Two) 06**
- a) Differentiate between unordered and ordered file organization.
  - b) Explain the characteristics of the database approach.
  - c) Explain the ACID properties with examples.
- Q.4 Answer the following (Any Two) 06**
- a) Discuss the multilevel indexing.
  - b) Explain type of attributes in ER model.
  - c) What is Normalization? Explain 1 and 2 NF.
- Q.5 Answer the following (Any One) 06**
- a) Explain Relational data model.
  - b) Explain database architecture in detail.

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**B.Sc. (Plain) (Semester - I) (New) (NEP CBCS) Examination:  
October/November – 2025  
Geoinformatics  
Introduction to Geoinformatics (G04-0114)**

Day & Date: Friday, 21-11-2025  
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. (MCQ)****06**

- 1) GIS stands for: \_\_\_\_\_.
  - a) General Information System
  - b) Geographical Imaging Service
  - c) Geographic Information System
  - d) Global Internet Service
  
- 2) Which of the following best defines GIS?
  - a) A tool for printing maps
  - b) A satellite navigation device
  - c) A weather forecasting tool
  - d) A system for capturing, storing, analyzing, and displaying geographic data
  
- 3) Which activity is a direct application of GIS technology?
  - a) Reading traditional paper maps
  - b) Writing geographical essays
  - c) Creating literary works
  - d) Mapping and spatial analysis
  
- 4) The study of Earth's physical features and human activities on Earth's surface is known as: \_\_\_\_\_.
 

a) Geology	b) Geography
c) Astronomy	d) Meteorology
  
- 5) Which of the following is an example of applying Geography in daily life?
  - a) Identifying suitable locations for construction
  - b) Understanding weather patterns for farming
  - c) Calculating star distances
  - d) Analyzing chemical reactions
  
- 6) Geography is primarily concerned with understanding: \_\_\_\_\_.
 

a) Time and historical events	b) Space and spatial relationships
c) Molecular structures	d) Literary analysis

- Q.2 Answer the following. (Any Three) 06**
- a) How does geography affect daily life?
  - b) Give a real-world example of a spatial problem.
  - c) State one basic function of GIS.
  - d) Define GIS.
  - e) Give an example of GIS in everyday life.
- Q.3 Answer the following. (Any Two) 06**
- a) What is the importance of maps in everyday life?
  - b) What are the two main branches of geography?
  - c) What is a River?
- Q.4 Answer the following (Any Two) 06**
- a) Define geography in simple terms.
  - b) Name the main components of GIS.
  - c) Write a short note on Absolute location
- Q.5 Answer the following (Any One) 06**
- a) Define three themes of Geography
  - b) Why Geography is Important?

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**B.Sc. (Plain) (Semester - III) (New) (NEP CBCS) Examination:  
October/November - 2025  
MATHEMATICS - IV  
Fundamentals of Laplace Transform (G04-DSC2-0320)**

Day & Date: Monday, 03-11-2025  
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 for each of the following.**

**06**

1)  $\mathcal{L}\{t^5\} = \underline{\hspace{2cm}}$

a)  $\frac{6!}{p^6}$

b)  $\frac{5!}{p^6}$

c)  $\frac{6}{p^6}$

d)  $\frac{5}{p^6}$

2) Find  $\mathcal{L}\{\sin 7t\} = \underline{\hspace{2cm}}$

a)  $\frac{p}{p^2 + 7^2}$

b)  $\frac{p}{p^2 - 7^2}$

c)  $\frac{7}{p^2 - 7^2}$

d)  $\frac{7}{p^2 + 7^2}$

3) If  $\mathcal{L}\{F(t)\} = f(p)$  then  $\mathcal{L}\{e^{at}F(t)\} = \underline{\hspace{2cm}}$

a)  $f(p + a)$

b)  $\frac{1}{p - a}$

c)  $\frac{1}{p + a}$

d)  $f(p - a)$

4) Find  $\mathcal{L}^{-1}\left\{\frac{7}{3p+2}\right\} = \underline{\hspace{2cm}}$

a)  $\frac{7}{3}e^{2t/3}$

b)  $\frac{7}{3}e^{3t/2}$

c)  $\frac{7}{3}e^{-2t/3}$

d)  $\frac{7}{3}e^{-3t/2}$

5) If  $\mathcal{L}^{-1}\{f(p)\} = F(t)$  then  $\mathcal{L}^{-1}\{f(ap)\} = \underline{\hspace{2cm}}$

a)  $\frac{1}{a}F(t)$

b)  $aF\left(\frac{t}{a}\right)$

c)  $\frac{1}{a}F\left(\frac{t}{a}\right)$

d)  $\frac{1}{a}F\left(\frac{a}{t}\right)$

- 6) If  $\mathcal{L}^{-1}\left\{\frac{p}{p^2+a^2}\right\} = \underline{\hspace{2cm}}$
- |               |               |
|---------------|---------------|
| a) $\sin at$  | b) $\cos at$  |
| c) $\sinh at$ | d) $\cosh at$ |

**Q.2 Attempt the following. (Any Three)**

06

- a) Prove that  $\mathcal{L}\{1\} = \frac{1}{p}$ , if  $p > 0$
- b) Prove that  $\mathcal{L}\{e^{at}\} = \frac{1}{p-a}$ , if  $p > a$
- c) Find  $\mathcal{L}\{e^{-2t}t\}$
- d) Find  $\mathcal{L}^{-1}\left\{\frac{p}{p^2+4} + \frac{1}{p^2+4}\right\}$
- e) Find  $\mathcal{L}^{-1}\left\{\frac{p+p^2}{p^3}\right\}$

**Q.3 Attempt the following. (Any Two)**

06

- a) If  $\mathcal{L}\{F(t)\} = f(p)$  then prove that  $\mathcal{L}\{t.F(t)\} = -\frac{d}{dp}[f(p)]$
- b) Find  $\mathcal{L}^{-1}\left\{\frac{3p+7}{p^2-2p-3}\right\}$
- c) Solve  $\frac{d^2y}{dt^2} + y = 0$  under the conditions that  $y = 1, \frac{dy}{dt} = 0$  at  $t = 0$

**Q.4 Attempt the following. (Any Two)**

06

- a) If  $\mathcal{L}\{F(t)\} = f(p)$  then prove that  $\mathcal{L}\{F(at)\} = \frac{1}{a}f\left(\frac{p}{a}\right)$
- b) If  $\mathcal{L}^{-1}\{f(p)\} = F(t)$  then prove that  $\mathcal{L}^{-1}\{f(p-a)\} = e^{at}\mathcal{L}^{-1}\{f(p)\}$
- c) If  $F(t)$  have period  $T > 0$ , so that  $F(t+T) = F(t)$ , for all  $t > 0$ , then
- $$\mathcal{L}\{F(t)\} = \frac{1}{1-e^{-pT}} \int_0^T e^{-pt} F(t) dt$$

**Q.5 Attempt the following. (Any One)**

06

- a) If  $F(t)$  and  $G(t)$  be two functions of class  $A$  and  $\mathcal{L}^{-1}\{f(p)\} = F(t)$  and  $\mathcal{L}^{-1}\{g(p)\} = G(t)$ , then  $\mathcal{L}^{-1}\{f(p).g(p)\} = \int_0^t F(x)G(t-x)dx = F * G$
- b) i) Evaluate  $\int_0^\infty e^{-3t}.t.\sin t dt$
- ii) Find  $\mathcal{L}\left\{\frac{\sin t}{t}\right\}$