



SLR-SX – 1

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**B.Sc. – I (Semester – I) (Biotechnology) Examination, 2017**  
**ENGLISH (Compulsory) (CBCS Pattern) (Old)**  
**‘On Track’ English Skills for Success**

Day and Date : Tuesday, 31-10-2017

Total Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

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

1. Complete the following statements by choosing the correct alternatives from those given below them :

14

- 1) What did the policeman look like ?
  - a) Uniformed and short
  - b) Uniformed and well-built
  - c) Dressed in ordinary clothes and short
  - d) Dressed in ordinary clothes and well-built
- 2) What was Binet in the lesson ‘The Myths of Artificial Intelligence’ ?
  - a) a doctor
  - b) a teacher
  - c) a psychologist
  - d) none of the above
- 3) The story ‘After Twenty Years’ begins with a policeman who is on his \_\_\_\_\_
  - a) patrolling duty
  - b) jail duty
  - c) domestic duty
  - d) motor bike
- 4) Some experts say that \_\_\_\_\_ intelligence will soon come into existence.
  - a) Abnormal
  - b) Natural
  - c) Artificial
  - d) Scientific

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- 5) Criminal Bob was wanted by \_\_\_\_\_  
a) Indian  
b) Chicago  
c) New York  
d) Washington
- 6) The poem 'Bangle Sellers' is written by \_\_\_\_\_  
a) Kamala Das  
b) Kamala Markandeya  
c) Sarojini Naidu  
d) C. B. Naidu
- 7) \_\_\_\_\_ was an uninvited guest.  
a) Miss Krishna  
b) The writer  
c) Miss Krishna's friend  
d) Miss Krishna's sister
- 8) The word 'intelligence' is derived from \_\_\_\_\_ word 'intellegere'.  
a) German  
b) Greek  
c) Latin  
d) Urdu
- 9) From what she tells the writer, it is clear that Miss Krishna's life with her mother was \_\_\_\_\_  
a) Miserable  
b) Happy  
c) Comfortable  
d) Good
- 10) The Irish airman is from \_\_\_\_\_  
a) Ireland  
b) German  
c) America  
d) India
- 11) The word 'Beauty' is \_\_\_\_\_  
a) a common noun  
b) an abstract noun  
c) a collective noun  
d) no article
- 12) Sangoli Rayanna was a great freedom fighter. The underlined word is \_\_\_\_\_ noun.  
a) Proper                      b) Collective                      c) Common                      d) Abstract
- 13) \_\_\_\_\_ P. V. Sindhu won silver medal in badminton.  
a) A                                      b) An                                      c) The                                      d) No Article
- 14) Lalita Babar is \_\_\_\_\_ Maharashtra.  
a) from                                      b) by                                      c) into                                      d) at



2. Answer in brief **any seven** of the following : 14
- 1) What had happened to Big Joe Brady's restaurant ?
  - 2) Why did the narrator consider Miss Krishna an annoying guest ?
  - 3) Why did the narrator invite Miss Krishna to stay at her house ?
  - 4) What was the nickname for Bob that plain clothes policeman used ?
  - 5) How can you define 'Intelligence' ?
  - 6) What is 'virtual reality' by Attila Narin ?
  - 7) What sort of relationship did Jimmy and Bob share ?
  - 8) What do you understand about Miss Krishna's childhood from 'The Connoisseur' ?
3. A) Write short answers on **any two** of the following : 8
- 1) What is the theme of the poem 'Bangle Sellers' ?
  - 2) What is the Irish airman's attitude towards the war he is fighting in ?
  - 3) What type of bangles are carried by the bangle sellers ?
- B) Write a paragraph on **any two** of the following : 6
- 1) Advantages and disadvantages of mobile.
  - 2) Democracy.
  - 3) My Aim in Life.
4. Write an essay on **any one** : 14
- 1) The Superstitions.
  - 2) Corruption – Causes, Effects and Remedies.
5. Read the following passage and make notes of it. Use an appropriate title for your notes : 14
- Food, generally speaking, decays as the time passes. Some spoil within hours while others take days or weeks. Cooked food, uncooked meat and fish or fruits lose their freshness, become old and spoil in warm, wet air as these undergo changes because of bacteria. Before modern methods of preservation came to be known, food items were prevented from decomposing with the help of salt, heat of the Sun, oil, etc. Fish can be preserved by salting it in heat of the Sun. Another traditional example is the pickles in oil so that we keep in bottles. We put salt and soak pickles in oil so that they remain fresh.



But today, food science and food technology have helped us preserve food with their modern techniques, Factories prepare and produce readymade foods-meat, fish, peas and fruits. They use certain processes like canning, dehydration, smoke and refrigeration.

Foods can be preserved by controlling or destroying the agents like warm and wet air, bacteria, insects and rodents.

Canning is a thermal or heat processing where foods are subjected to temperatures that are high enough to kill micro-organisms. Foods are sterilized in air tight and heat resistant pouches.

Dehydration removes water from food and thus prevents bacteria from growing. It then compresses and freeze-dries food which can resume their normal state on rehydration.

Refrigeration helps store foods with their nutrients and flavours. But smoke treatment to foods can preserve them only for a short time.

Certain substances in small amounts are added to foods to make them last longer, to give them colour, to add flavour to them, to add minerals. They are known as additives. Bezoates, propionic acids, sodium and calcium salts are a few preservatives. Yellow carotene dyes add colour. Ascorbic acid helps to prevent discolouration in canned foods. Additives are found in baked foods, confectionary items, soft drinks and juices.

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**B.Sc. – I (Semester – I) (CBCS) Examination, 2017**  
**BIOTECHNOLOGY**  
**Ecology and Microbiology**  
**Paper – I : Ecology**

Day and Date : Wednesday, 1-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

1. Rewrite the sentences using correct alternatives given below : 14
- i) The multilayered gaseous envelope surrounding the planet earth is called  
a) Biosphere      b) Lithosphere      c) Hydrosphere      d) Atmosphere
  - ii) Ozonosphere situated in \_\_\_\_\_ zone.  
a) Stratosphere      b) Troposphere      c) Mesosphere      d) Ionosphere
  - iii) Upper region of the troposphere has a narrow boundary called the \_\_\_\_\_, which has constant region ?  
a) Stratopause      b) Tropopause      c) Mesopause      d) Mesosphere
  - iv) Plants growing in abundant water are called as  
a) Mesophytes      b) Hydrophytes      c) Xerophytes      d) Halophytes
  - v) Ecology deals with study of  
a) Living things  
b) Non living things  
c) Interaction of living and non living things  
d) Environment
  - vi) In an ecosystem \_\_\_\_\_ shows one way passage.  
a) Nitrogen      b) Carbon      c) Potassium      d) Free energy
  - vii) \_\_\_\_\_ of the following is primary consumer.  
a) Producer      b) Top carnivore      c) Carnivore      d) Herbivore
  - viii) The ecological succession begins from the primitive substratum called as \_\_\_\_\_ succession.  
a) Primary      b) Secondary      c) Autogenic      d) Heterotrophic
  - ix) Crop plant ecosystem is \_\_\_\_\_ type of ecosystem.  
a) Natural      b) Artificial      c) Marine      d) Limnic
  - x) \_\_\_\_\_ is type of *In situ* conservation.  
a) Zoo      b) Nurseries      c) Forest      d) Laboratories
  - xi) \_\_\_\_\_ is a type of sedimentary cycle.  
a) Hydrological      b) Carbon      c) Oxygen      d) Sulphur

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- xii) Organisms feed on dead and detritus matters are called as  
a) Autotrophes      b) Heterotrophes      c) Saprophytes      d) Phytoplankton
- xiii) The term ecology was coined by  
a) E.P. Odum      b) A.G. Tansley      c) Charles elton      d) Juday
- xiv) The term biodiversity was coined by  
a) Walter G. Rosen      b) Cox and Atkins  
c) McNaughton and Wolf      d) Funk and Wagnales

2. Define and explain **any seven** of the given below : **14**
- i) Ecosystem
  - ii) Hydrosphere
  - iii) Decomposition
  - iv) Producer
  - v) Biogeochemical cycle
  - vi) Endemic species
  - vii) Net productivity
  - viii) Biodiversity
  - ix) Estuarine.
3. A) Answer **any two** of the given below : **10**
- i) Write a short note on lithosphere.
  - ii) Explain energy transfer in ecosystem.
  - iii) Explain about Chipko Andolan.
- B) Explain in detail functions of ecosystem. **4**
4. Answer **any two** of the given below : **14**
- i) Give a detailed account on Biosphere.
  - ii) Explain in brief ecological succession with types.
  - iii) Explain different conservation methods.
5. Answer **any two** of the given below : **14**
- i) Explain forest as natural resources with its conservation and management.
  - ii) Write a note on aquatic ecosystem.
  - iii) Explain in detail sedimentary cycle and its importance.



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**B.Sc. – I (Semester – I) (Biotechnology) (CBCS) Examination, 2017  
MICROBIOLOGY Paper – II  
Ecology and Microbiology**

Day and Date : Thursday, 2-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

- Note :** 1) **All** questions are **compulsory** and carry **equal** marks.  
2) Draw a **neat** labelled diagram **wherever** necessary.  
3) Figure to the **right** indicates **full** marks.

1. Rewrite the following sentences by choosing correct alternatives from given below :

14

- i) The viruses that live as parasites on bacteria are  
a) Fungi  
b) Commensals  
c) Bacteriophages  
d) None of these
- ii) \_\_\_\_\_ microorganism shows absence of cell wall.  
a) *E.coli*  
b) *Pseudomonas*  
c) *Mycoplasma*  
d) *Bacillus*
- iii) Antiseptic surgery was discovered by  
a) Joseph Lister  
b) Ernest Abbe  
c) Pasteur  
d) Beijerinck
- iv) \_\_\_\_\_ is a metabolic process that converts sugar to acids, gases or alcohol by bacteria.  
a) Metabolism  
b) Addition  
c) Recombination  
d) Fermentation
- v) Rod shaped bacteria are known as  
a) Cocci  
b) Comma forms  
c) Bacilli  
d) Pleomorphic form

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- vi) The major locomotory structure of bacterial cell is
- a) Cell wall
  - b) Cell membrane
  - c) Capsule
  - d) Flagella
- vii) \_\_\_\_\_ is the structural component of bacterial cell membrane.
- a) Amino sugar
  - b) Phospholipid
  - c) DNA
  - d) RNA
- viii) \_\_\_\_\_ type of ribosome is present in prokaryotic cell.
- a) 70S
  - b) 80S
  - c) 90S
  - d) 100S
- ix) Teichoic acid is present in cell wall of \_\_\_\_\_ bacteria.
- a) Gram Negative
  - b) Gram Positive
  - c) Fungi
  - d) Algae
- x) It is an example of Fungi
- a) *Aspergillus niger*
  - b) *Bacillus subtilis*
  - c) *E.coli*
  - d) All
- xi) Tyndallization process is discovered by
- a) Edward Jenner
  - b) Robert Koch
  - c) Alexander Fleming
  - d) John Tyndall
- xii) Alexander Fleming discovered \_\_\_\_\_ antibiotics.
- a) Streptomycin
  - b) Penicillin
  - c) Tetracycline
  - d) Nystatin
- xiii) Father of microbiology is
- a) Antony Van Leeuwenhoek
  - b) Louis Pasteur
  - c) Edward Jenner
  - d) Robert Koch
- xiv) \_\_\_\_\_ are the strict intracellular parasites.
- a) Viruses
  - b) Fungi
  - c) Algae
  - d) None

2. Answer **any seven** of the following :

14

- i) Function of capsule.
- ii) What is abiogenesis ?
- iii) Define antibiotics with one example.

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- iv) Function of slime layer.
  - v) Define soil microbiology.
  - vi) Actinomycetes.
  - vii) Pili.
  - viii) Koch postulates.
  - ix) Edward Jenner.
3. A) Answer **any two** of the following : **10**
- i) Explain in detail structure of Gram positive cell wall.
  - ii) Describe in detail harmful activities of microorganisms.
  - iii) Describe in detail general characteristic of viruses.
- B) Write difference between prokaryotic and eukaryotic cell. **4**
4. Answer **any two** of the following : **14**
- i) Describe in detail structure and function of flagella.
  - ii) Explain in detail structure and function of endospore.
  - iii) Explain in detail characteristics of Archaeobacteria.
5. Answer **any two** of the following : **14**
- i) Describe in detail applied branches of microbiology.
  - ii) Write in detail general characteristic of Rickettsia and Mycoplasma.
  - iii) Explain in detail structure of Plasma membrane of bacteria.
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**B.Sc. – I (Biotechnology) (Semester – I) (CBCS) Examination, 2017**  
**INTRODUCTION TO BIOSCIENCES**  
**Paper – I : Animal Sciences**

Day and Date : Friday, 3-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. Rewrite the following sentences by using correct alternative : 14

- 1) \_\_\_\_\_ is a marine water fish.
  - a) Rohu
  - b) Catla
  - c) Mrigal
  - d) Sardine
- 2) The functional unit of kidney is \_\_\_\_\_.
  - a) Neuron
  - b) Nephron
  - c) Sarcomere
  - d) Actin
- 3) The crown of the tooth is covered by \_\_\_\_\_.
  - a) Chitin
  - b) Dentine
  - c) Cartilage
  - d) Enamel
- 4) In pancreas,  $\beta$ -cells secrete \_\_\_\_\_.
  - a) Glucagon
  - b) Insulin
  - c) Renin
  - d) Gastrin
- 5) In honey bee colony, queens are \_\_\_\_\_.
  - a) Fertile male
  - b) Fertile female
  - c) Sterile female
  - d) Sterile male
- 6) Serous cells in the stomach secretes \_\_\_\_\_.
  - a) Trypsinogen
  - b) Pepsinogen
  - c) HCl
  - d) Mucous

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- 7) Ascaris belongs to phylum \_\_\_\_\_
- a) Platyhelminthes
  - b) Nematelminthes
  - c) Coelenterata
  - d) Annelida
- 8) Chloroquine is used to treat \_\_\_\_\_
- a) Malaria
  - b) Amoebic dysentery
  - c) Schistosomiasis
  - d) Ascariasis
- 9) \_\_\_\_\_ is not belong to phylum Platyhelminthes.
- a) Liver fluke
  - b) Tape worm
  - c) Ascaris
  - d) Schistosoma
- 10) Rearing of earthworm for production vermicompost is called \_\_\_\_\_
- a) Apiculture
  - b) Vermiculture
  - c) Sericulture
  - d) Aquaculture
- 11) *Bombyx mori* is commonly called as \_\_\_\_\_ silkworm.
- a) Eri
  - b) Muga
  - c) Mulberry
  - d) Tasar
- 12) Structural and functional unit of testis \_\_\_\_\_
- a) Seminiferous tubule
  - b) Uriniferous tubule
  - c) Sarcomere
  - d) Haversian system
- 13) \_\_\_\_\_ is causative agent of Amoebic dysentery.
- a) *Taeniasolium*
  - b) *Plasmodium vivax*
  - c) *Entamoebahistolytica*
  - d) *Fasciola hepatica*
- 14) During nuptial flight pheromones were secreted by \_\_\_\_\_ to attract males.
- a) Males
  - b) Workers
  - c) Queens
  - d) Soldiers

2. Answer the following (any 7) :

14

- i) What is mean by Vermicompost ?
- ii) Give economic importance of aquaculture.
- iii) Give types of silkworms.



- iv) Give parasitic adaptations in Liver fluke.
  - v) Draw a neat labeled diagram of Tapeworm.
  - vi) Write a note on honey bee casts.
  - vii) Define Mimicry.
  - viii) Write a note on islets of Langerhans.
  - ix) Write a note on hormones of adenohipophysis.
3. A) Answer on **any two** the following : **10**
- i) Explain structure, location and function of compound epithelial tissue.
  - ii) Describe life cycle of Tapeworm.
  - iii) Explain process of vermiculture and add a note on vermiwash.
- B) Write a note on Camouflage with suitable example. **4**
4. Answer on **any two** the following : **14**
- i) Describe structure and function of pituitary gland with neat labeled diagram.
  - ii) Describe life cycle of *Ascaris*.
  - iii) Describe construction and maintenance of aquarium.
5. Answer on **any two** the following : **14**
- i) Explain life cycle of Malarial parasite with neat labeled diagram.
  - ii) Describe types , rearing, life cycle and economic importance of honey bees.
  - iii) Describe histology of stomach and liver with neat labeled diagram.
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**B.Sc. I (Biotechnology) (Semester – I) Examination, 2017  
(CBCS)**

**BIOTECHNOLOGY  
Introduction to Biosciences  
Paper – II : Plant Sciences**

Day and Date : Monday, 6-11-2017

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

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

1. Choose the most correct alternative for the following and rewrite the sentences : **14**

- 1) The main function of \_\_\_\_\_ Chlorenchyma.
  - a) to storage food
  - b) photosynthesis
  - c) to give strength
  - d) to float on water
- 2) In stem anatomy, the outermost layer is
  - a) Endodermis
  - b) Pericycle
  - c) Xylem
  - d) Epidermis
- 3) Pollen grain represents
  - a) Male gametophyte
  - b) Partly developed male gametophyte
  - c) Female gametophyte
  - d) Female gamete
- 4) Tunica-Corpus theory based on
  - a) plane of cell division
  - b) direction of cell division
  - c) rate of shot tip growth
  - d) number of surface layers
- 5) Agar-agar is obtained from
  - a) *Spirogyra*
  - b) *Sargassum*
  - c) *Gracillaria*
  - d) *Nostoc*
- 6) Mango is \_\_\_\_\_ type of fruit.
  - a) pepo
  - b) berry
  - c) drupe
  - d) capsule

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- 7) Endosperm is generally  
a) Haploid                      b) Diploid                      c) Triploid                      d) Polyploid
- 8) Height of plant increased due to the  
a) apical meristem                      b) lateral meristem  
c) intercalary meristem                      d) parenchyma
- 9) Innermost layer of the cortex is called  
a) hypodermis                      b) epidermis                      c) endodermis                      d) pericycle
- 10) The two reproductive organs of the flower  
a) Calyx and Corolla                      b) Androecium and gynoecium  
c) Carpels and calyx                      d) Corolla and carpels
- 11) The vascular bundle in stem of monocot is  
a) Inverted                      b) Bicolateral                      c) Radial                      d) Collateral
- 12) *Sphagnum* is  
a) Algae                      b) Fungi                      c) Bryophyte                      d) Pteridophyte
- 13) Out of following \_\_\_\_\_ is gymnospermic plant.  
a) Coconut                      b) *Cycas*                      c) Mango                      d) *Ficus*
- 14) Major cereals of India is  
a) Rice                      b) Wheat                      c) Maize                      d) All of the above

2. Attempt **any seven** of the following :

**14**

- 1) What is hypodermis ?
- 2) Write the function of xylem.
- 3) Draw neat labeled diagram of carpel.
- 4) What is pollination ?
- 5) What is complex tissue ? Give its types.
- 6) Define parthenocarpy.
- 7) Give any four characters of gymnosperm.
- 8) Enlist the alcohol and flavor producing plants.
- 9) Define simple tissue and give its types.

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3. A) Attempt **any two** of the following : 10
- 1) Describe meristem based on its position.
  - 2) What is flower ? Describe floral whorls of typical flower.
  - 3) Write the general characters of Fungi.
- B) Describe Simple tissue. 4
4. Attempt **any two** of the following : 14
- 1) Classify the fruits with suitable example.
  - 2) Give economic importance of Angiosperms.
  - 3) Describe the primary structure of monocot root.
5. Attempt **any two** of the following : 14
- 1) Give economic importance of algae.
  - 2) Describe development of male gametophyte of angiosperm.
  - 3) Give an account of origin of staple crop.
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**B.Sc. – I (Semester – I) (CBCS Pattern) Examination, 2017**  
**BIOTECHNOLOGY**  
**Fundamentals of Chemistry and Biophysics**  
**Paper – I : Chemical Sciences**

Day and Date : Tuesday, 7-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

- N.B. :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**  
3) **Use of log tables/calculators is allowed.**

1. Select the most correct alternative from those given below and complete the sentence.

14

- The average carbon-carbon bond length in compounds with  $sp^3$  hybridized carbon is \_\_\_\_\_ Å.  
a) 1.54                      b) 1.33                      c) 1.44                      d) 2.25
- Methane molecule has \_\_\_\_\_ geometry.  
a) tetrahedral                      b) linear  
c) triangular                      d) octahedral
- \_\_\_\_\_ is not an extensive property.  
a) Molarity                      b) Density                      c) Mass                      d) Volume
- \_\_\_\_\_ molecule is formed by ionic bond.  
a) Methane                      b) KCl                      c)  $Cu[NH_3]_4$                       d) Ethane
- When weight of compound equal to its molecular weight is dissolved in one liter of solvent the solution will be one \_\_\_\_\_ solution.  
a) molal                      b) normal                      c) molar                      d) percent
- \_\_\_\_\_ is an example of polar solvent.  
a) Carbon tetrachloride                      b) Benzene  
c) Xylene                      d) Water
- According to VBT water molecule has \_\_\_\_\_ shape.  
a) B                      b) T                      c) V                      d) L

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- 8) The integrated rate expression for first order reaction is  
a)  $k = 2.303/t \times \log a/(a - x)$       b)  $k = 2.303/t \times \log b/(a - x)$   
c)  $k = \log b/(a - x)$       d)  $k = \log a/(a - x)$
- 9) pH value of acidic buffer has \_\_\_\_\_ range of pH.  
a) 7 – 9      b) 9 – 12      c) 2 – 6      d) 7 – 14
- 10) \_\_\_\_\_ is used as an indicator for strong acid and strong base titration.  
a) Eriochrome Black-T      b) Methyl orange  
c) Phenolphthalein      d) EDTA
- 11) H–C–H bond angle in methane is  
a)  $120^\circ$       b)  $109^\circ 28'$       c)  $180^\circ$       d)  $107^\circ$
- 12)  $\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \longrightarrow 2 \text{HCl}(\text{g})$  is an example of \_\_\_\_\_ catalysis.  
a) enzyme      b) heterogeneous  
c) auto      d) homogenous
- 13) A catalyst increases the rate of reaction by  
a) increasing  $E_a$       b) increasing T  
c) decreasing  $E_a$       d) decreasing T
- 14) Enzyme catalyzed reactions are carried out at  
a) very high      b) room temperature  
c) very low      d) very high pH

2. Attempt **any seven** of the following :

14

- 1) Write any two characteristics of first order reaction.
- 2) What is common ion effect ?
- 3) Give one example of polar and non polar solvent.
- 4) Mention any two factors affecting solubility.
- 5) Define osmosis. Give one example.
- 6) Define hybridization. Mention its types.
- 7) Define bond angle and bond energy.
- 8) Write any two characteristics of covalent compounds.
- 9) What are colligative properties. Give one example.



3. A) Attempt **any two** of the following : 10
- 1) Explain VBT Postulates.
  - 2) Explain types of bonds in bio-molecules.
  - 3) Explain what are enzyme catalyzed reactions ?
- B) For a first order reaction, rate constant is  $6.4 \times 10^{-4}$  and initial concentration is 0.04 M how long it will take to react 25% of the reactant ? 4
4. Attempt **any two** of the following : 14
- 1) What is catalysis ? Explain its types with example.
  - 2) Derive an integrated rate expression for first order reaction.
  - 3) Explain concept of sp hybridization with respect to  $C_2H_2$  molecule.
5. Attempt **any two** of the following : 14
- 1) Derive Henderson equation for acidic buffers.
  - 2) Give comparison between ionic and covalent compounds.
  - 3) What is osmotic pressure ? Explain concept of osmosis and reverse osmosis.
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**B.Sc. – I (Semester – I) (Biotechnology) (CBCS Pattern)  
Examination, 2017  
FUNDAMENTALS OF CHEMISTRY AND BIOPHYSICS  
Biophysics (Paper – II)**

Day and Date : Wednesday, 8-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

- N. B. :** i) **All** questions are **compulsory**.  
ii) Figures to the **right** indicate **full** marks.  
iii) **Neat** diagrams should be drawn **wherever** necessary.

1. Select the correct alternative from the following : 14
- i) Water flow through a horizontal canal calmly then the type of flow is \_\_\_\_\_  
a) Streamline flow                                  b) Turbulent flow  
c) Circular    d) None of these
- ii) The SI unit of stress is \_\_\_\_\_  
a) N/m<sup>2</sup>                                  b) dyne/cm<sup>2</sup>                                  c) m/s                                  d) N/sec<sup>2</sup>
- iii) For propagation of \_\_\_\_\_ material medium is required.  
a) Light waves                                  b) X-rays  
c) Mechanical waves                                  d) Electromagnetic waves
- iv) The phenomenon of bending of path of light waves at an edge of obstacle is called \_\_\_\_\_  
a) Refraction                                  b) Diffraction  
c) Reflection                                  d) Interference
- v) Young's modulus is the property of \_\_\_\_\_  
a) Solids and liquids                                  b) Liquids and gases  
c) Only solids                                  d) Only liquids
- vi) By Brewster's law, polarising angle ( $i_p$ ) and refractive index ( $\mu$ ) are related as \_\_\_\_\_  
a)  $\mu = \tan(i_p)$                                   b)  $\mu = \sin(i_p)$                                   c)  $\mu = \cos(i_p)$                                   d)  $\mu = \frac{1}{i_p}$

P.T.O.



- vii) Audible range frequency is \_\_\_\_\_
- a) 20 Hz to 20 KHz                                      b) 10 Hz to 10 KHz  
c) 20 KHz to 200 KHz                                  d) 1 Hz to 20 KHz
- viii) Angle of contact between pure water and clean glass is \_\_\_\_\_
- a)  $90^\circ$                                       b) Zero                                      c)  $120^\circ$                                       d)  $50^\circ$
- ix) For constructive interference, the path difference for two monochromatic light waves reaching at a point is \_\_\_\_\_
- a)  $2n\lambda$                                       b)  $n\lambda$                                       c)  $(2n + 1)\lambda$                                       d)  $(2n + 1)\frac{\lambda}{2}$
- x) SI unit of surface tension is \_\_\_\_\_
- a) N/s                                      b) Kg/m                                      c) J/m                                      d) N/m
- xi) Viscosity of water \_\_\_\_\_ with increase in pressure.
- a) Increases                                      b) Decreases  
c) Remains constant                                      d) May increase or decrease
- xii) \_\_\_\_\_ indicates the resistance offered by the material when an attempt is made to change in its shape.
- a) Young's modulus                                      b) Modulus of rigidity  
c) Bulk modulus                                      d) Strain
- xiii) Ultrasonic waves have \_\_\_\_\_
- a) Low frequency and large wavelength  
b) High frequency and small wavelength  
c) Both frequency and wavelength high  
d) Both frequency and wavelength low
- xiv) Ink rises in a pen due to \_\_\_\_\_
- a) Elasticity                                      b) Strain  
c) Capillary action                                      d) Viscosity

2. Answer **any seven** of the following :

14

- 1) State any two applications of laser source of light.
- 2) Define viscosity.
- 3) What is Doppler effect ?



- 4) State Hooke's law.
  - 5) What do you mean by capillary action ?
  - 6) State the principle of superposition of waves.
  - 7) Define :
    - a) Stress
    - b) Strain.
  - 8) State Bernoulli's theorem.
  - 9) Define :
    - a) Surface tension
    - b) Angle of contact.
3. A) Answer **any two** of the following : **10**
- 1) Discuss the factors affecting surface tension.
  - 2) Explain the working of Pitot's tube.
  - 3) What is elasticity ? Explain the importance of elasticity.
- B) Explain any two applications of ultrasonic waves. **4**
4. Answer **any two** of the following : **14**
- 1) Explain in detail 'Nicol prism'.
  - 2) Describe the construction and working of venturimeter.
  - 3) Explain the terms :
    - a) Young's modulus
    - b) Bulk modulus
    - c) Modulus of rigidity and state the relation between them.
5. Answer **any two** of the following : **14**
- 1) Describe construction and working of Helium Neon Laser.
  - 2) Describe Jaeger's method for the measurement of surface tension.
  - 3) What are sound waves ? Define transverse and longitudinal waves and state their characteristics.
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SLR-SX – 8

Seat No.	
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Set **P**

**B.Sc. I (Biotechnology) (Semester – I) (CBCS) Examination, 2017**  
**Cell Biology and Biostatistics**  
**Paper – I : CELL BIOLOGY**

Day and Date : Thursday, 9-11-2017

Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

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

1. Rewrite the following sentences by using correct alternative. 14

- 1) In \_\_\_\_\_ type of transport ATP molecules is used.
  - a) Osmosis
  - b) Simple diffusion
  - c) Facilitated diffusion
  - d) Na-K ATPase
- 2) In synaptic signaling, \_\_\_\_\_ is act as signaling molecule.
  - a) Neurotransmitter
  - b) Hormone
  - c) Pheromone
  - d) Enzyme
- 3) Nuclear Localization Signal (NLS) si used to localize proteins in the \_\_\_\_\_.
  - a) nucleiod
  - b) mitochondria
  - c) nucleolus
  - d) nucleus
- 4) Meiosis is considered as \_\_\_\_\_ cell division.
  - a) equational
  - b) reductional
  - c) equatorial
  - d) lattitudinal
- 5) Primary lysosomes are derived from \_\_\_\_\_ cell organelle.
  - a) RER
  - b) Golgi apparatus
  - c) SER
  - d) Ribosomes
- 6) Traumatic cell death is called \_\_\_\_\_.
  - a) Necrosis
  - b) Apoptosis
  - c) Cell suicide
  - d) Cell quit

P.T.O.



- 7) Crossing over occur in \_\_\_\_\_ phase of prophase I of meiosis.  
a) Zygotene    b) Pachytene    c) Diplotene    d) Leptotene
- 8) Sarcoma is cancer of \_\_\_\_\_ cells.  
a) Muscle    b) Bone    c) Epithelial    d) Nerve
- 9) Codons GGA, GGU, GGC and GGG specify same amino acid, this is \_\_\_\_\_ of genetic code.  
a) Universlity    b) Degeneracy  
c) Non-ambiguity    d) Ambiguity
- 10) \_\_\_\_\_ is an example of intermediate filaments  
a) Vimentin    b) Lamin    c) Keratin    d) All of these
- 11) \_\_\_\_\_ cell organelle is actively involved in intracellular digestion.  
a) Mitochondria    b) Lysosome  
c) Chloroplast    d) Golgi complex
- 12) Microtubules are polymer of \_\_\_\_\_  
a) Tubulin dimer    b) Globular actin  
c) Keratin    d) None of these
- 13) “Unit membrane model” of plasma membrane was proposed by \_\_\_\_\_  
a) Robertson    b) Singer and Nicolson  
c) Danielli and Davson    d) Gorter and Grendel
- 14) In \_\_\_\_\_ phase of cell division chromosomes are arranged at equator of the cell.  
a) Prophase    b) Metaphase  
c) Telophase    d) Anaphase

2. Answer the following (**any 7**) :

14

- i) What are lysosomes ?
- ii) What are actin filaments ?
- iii) Give significance of meiosis.
- iv) Write a note on cell growth curve.
- v) Draw a neat labeled diagram of hemi-desmosomes.
- vi) Write a note on ribosomes.

Set P



- vii) What is facilitated diffusion ?
  - viii) Give characteristics of cancer cells.
  - ix) What are intracellular compartments ?
3. A) Answer on **any two** the following. **10**
- i) Describe structure, assembly and functions of microfilaments.
  - ii) Describe types of active transport with suitable examples.
  - iii) Describe ultrastructure and function of mitochondria.
- B) Describe structure and function of typical eukaryotic chromosome. **4**
4. Answer on **any two** the following. **14**
- i) Describe ultrastructure of typical plant cell wall.
  - ii) Describe process of mitosis with its significance.
  - iii) Describe different models of plasma membrane with suitable diagram.
5. Answer on **any two** the following. **14**
- i) Describe protein trafficking in endoplasmic reticulum and chloroplast.
  - ii) Explain different type's cell signaling with suitable diagrams.
  - iii) Describe properties of genetic code with suitable examples.
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SLR-SX – 9

Seat No.	
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Set **P**

**B.Sc. – I (Biotechnology) (Semester – I) (CBCS) Examination, 2017**  
**CELL BIOLOGY AND BIostatISTICS**  
**Paper – II : Biostatistics**

Day and Date : Friday, 10-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

- Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right indicates full marks.**  
3) **Use of basic calculator is allowed.**  
4) **Use graph paper wherever necessary.**

1. Rewrite the following sentences by using correct alternative : **14**
- 1) Secondary data do not include sources like  
a) Office records    b) Bulletins    c) Reports    d) Direct interviews
  - 2) In a table the headings of the rows given in the first column are called  
a) Stubs    b) Captions    c) Titles    d) Source note
  - 3) If the sum of 'n' observations is 540 and their mean 36, then the value of n is  
a) 19440    b) 54    c) 15    d) 36
  - 4) Shoe size of the most of the people in India is No. 8. Which measure of central value does it represent ?  
a) Mean    b) Median    c) Mode    d) Average
  - 5) Frequency of the variable is always  
a) in percentage    b) a fraction    c) an integer    d) none of the above
  - 6) In an individual series, each variate value  
a) Has same frequency    b) Has frequency one  
c) Has varied frequency    d) Has frequency two
  - 7) Let  $x_1, x_2, \dots, x_n$  be the set of observations, L = Largest and S = Smallest value in the data then the formula for coefficient of range is  
a)  $(L + S)/(L - S)$     b)  $(L - S)/L$   
c)  $(L - S)/(L + S)$     d)  $L/S$

P.T.O.



- 8) Sum of the deviations about mean is  
a) zero                      b) minimum                      c) maximum                      d) one
- 9) Which of the following is not a possible value of the correlation coefficient ?  
a) + 1                      b) – 1                      c) 0.011                      d) 1.11
- 10) Classical probability is measured in terms of  
a) An absolute value                      b) A ratio  
c) Absolute value and ratio both                      d) None of the above
- 11) If A and B are two events, the probability of occurrence of either A or B is given as  
a)  $P(A) + P(B)$                       b)  $P(A \cup B)$                       c)  $P(A \cap B)$                       d)  $P(A) \cdot P(B)$
- 12) An event is \_\_\_\_\_ of sample space.  
a) Super set                      b) Power set                      c) Sub set                      d) Complement
- 13) The sum of the probabilities of all sample events in the sample space must be equal to  
a) 0                      b) – 1                      c) 1                      d) 0.5
- 14) The value of the level of significance lies between  
a) – 1 and 1                      b) 0 and 1                      c) 1 and 2                      d) – 1 and 0

2. Attempt **any five** of the following :

14

- 1) Define 'Class mark' and give an example.
- 2) State demerits of 'Mean'.
- 3) The marks obtained in Zoology by 10 students are 57, 69, 66, 48, 72, 63, 56, 65, 70, 74. Calculate the mean marks.
- 4) Compute the coefficient of range for data : 43, 56, 78, 14, 59, 29, 10, 20, 55.
- 5) Find the correlation coefficient (r), if  $b_{yx} = 0.2$ ,  $b_{xy} = 1.8$ .
- 6) What is the probability of getting "a number greater than 2" in single throw with die ?
- 7) If  $P(A) = 0.3$ ,  $P(B) = 0.4$  and  $P(A \cap B) = 0.5$ . Find  $P\left(\frac{B}{A}\right)$ .
- 8) If standard deviation  $\sigma = 3.5$  and  $N = 12$  then find standard error.
- 9) If standard deviation  $\sigma = 2.96$  and mean  $\bar{x} = 13.5$  find the coefficient of variation.

Set P



3. A) Attempt **any two** of the following : 10

1) Calculate mode daily wages from the following data.

<b>Wages</b>	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
<b>No. of workers</b>	4	17	34	15	12	8

2) Write various applications of Biostatistics in detail.

3) A single card is drawn from a deck. Find the probability that it is a king or a club.

B) Solve the following : 4

Population of ducks in 100 lakes are as follows :

<b>No. of ducks</b>	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
<b>No. of lakes</b>	9	21	27	18	19	6

Draw a histogram.

4. Attempt **any two** of the following : 14

1) Draw less than and more than Ogive for the following data.

<b>X</b>	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
<b>F</b>	7	11	16	14	9	5	3

2) Find the coefficient of correlation (r) from the following data.

<b>X</b>	64	65	66	67	68	69	70
<b>Y</b>	66	67	68	69	70	71	72

3) Find the standard deviation ( $\sigma$ ) from the following data.

<b>Size of item</b>	6	7	8	9	10	11	12
<b>Frequency</b>	3	6	9	13	8	5	4

5. Attempt **any two** of the following : 14

1) Find the regression equation Y on X from the following data.

<b>X</b>	65	63	67	64	68	62	70	66	68	67
<b>Y</b>	68	66	68	65	69	66	68	65	71	67

2) A coin is tossed 100 times of which head comes 60 times and tail 40 times. Use Chi-square test to test the hypothesis that the coin is normal, having no bias for either head or tail. (Table value : 3.84)

3) Find the mean deviation of the following series :

<b>X</b>	10	11	12	13	14
<b>Frequency</b>	3	12	18	12	13



**SLR-SX – 10**

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Set **P**

**B.Sc. – I (Biotechnology) (Semester – II) (CBCS) Examination, 2017**  
**ENGLISH (Comp.) (New)**  
**On Track : English Skills for Success**

Day and Date : Tuesday, 14-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

1. Complete the following sentences by choosing the correct alternatives from those given below them.

**14**

- 1) Dr. Kalam had successfully tested \_\_\_\_\_ in France.
  - a) V-2 missile
  - b) Jupiter missile
  - c) SLV-3 apogee motor
  - d) None
- 2) What had the Maharaja of Khetri given Vivekananda ?
  - a) a copy of the Bhagwad Gita
  - b) money
  - c) a beautiful robe
  - d) none
- 3) On which day was the first session of the Parliament of Religion was scheduled to begin ?
  - a) on May 31, 1893
  - b) on September 11, 1893
  - c) on September 21, 1894
  - d) on May 31, 1894
- 4) To succeed in any mission, says Dr. Kalam, one needs
  - a) single handed victory
  - b) single minded devotion
  - c) single attempt success
  - d) single attempt failure
- 5) According to Nani Palkhivala, Dharma lives in the hearts of
  - a) plants
  - b) public men
  - c) temples
  - d) animals
- 6) What do you check to decide that a society is civilized ?
  - a) whether there is material progress
  - b) whether all the people have jobs
  - c) whether the people have freedom
  - d) whether the poorest are supported

**P.T.O.**



- 7) The words 'red slayer' indicate  
a) the murderer in red dress                      b) the red army of China  
c) the guards in red uniform                      d) the fighters race in Hindu
- 8) The poem 'Brahma' displays the influence of \_\_\_\_\_ on Emerson.  
a) the Ramayana    b) the Bible                      c) the Vedanta    d) the Shakuntala
- 9) The term 'bubble house' refers to  
a) the moon                      b) the stars                      c) the mars                      d) the sun
- 10) The poet in 'Full Moon' gives expression to  
a) the feeling of pity for moon                      b) the feeling of joy for the scientists  
c) the feeling of joy for moon                      d) the feeling of joy for lovers
- 11) Ramesh is the \_\_\_\_\_ of all my friends.  
a) most childish    b) child                      c) most childly    d) children
- 12) \_\_\_\_\_ must be germfree.  
a) The Childrens's                      b) The Children milk  
c) Children's milk                      d) Childrens milk
- 13) Prarthana succeeded in getting out of the \_\_\_\_\_ line.  
a) fired                      b) firing                      c) fiery                      d) fire
- 14) Though Nanda was in her \_\_\_\_\_ boat, she could use her smart phone.  
a) cell                      b) sale                      c) sail                      d) sell

2. Answer in brief **any seven** of the following :

14

- 1) How did Swami Vivekananda manage to reach Chicago ?
- 2) Why is the speech of Vivekananda called 'a tongue of flame' ?
- 3) What advice did Wernher von Braun give to Dr. Kalam ?
- 4) What picture of Dr. Kalam emerges from the essay ?
- 5) What does Nani Palkhivala say about freedom ?
- 6) What two rays of hope does Nani Palkhivala speak of ?
- 7) What is Kalam's opinion of Wernher von Braun ?
- 8) What is the Amnesty International ?



3. A) Write short answers on **any two** of the following : **8**
- 1) Theme of the poem 'Full Moon'.
  - 2) What transition has taken place in approach to the moon ?
  - 3) What is the message of poem 'Brahma' to the readers ?
- B) Write short answers on **any two** of the following : **6**
- 1) What are the essential features of notice ?
  - 2) Write a note on agenda.
  - 3) What is email ?
4. Write **any one** of the following : **14**
- You are Deepak Waghmare, Secretary of Science Forum, Solapur. The well known scientist has agreed to visit the forum and interact with the students. Write a notice and agenda informing members of the forum. Imagine the necessary details.
- OR
- You have been selected as a Sales Officer in a company. You have received an email. Write an email letter accepting offer.
5. Prepare curriculum vitae of a science graduate who has applied for the position of Marketing Officer. **14**
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SLR-SX – 11

Seat No.	
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**B.Sc. – I (Semester – II) (Biotechnology) (New-CBCS) Examination, 2017**  
**ENVIRONMENTAL POLLUTION AND MICROBIAL TECHNIQUES**  
**Paper – I : Environmental Pollution**

Day and Date : Wednesday, 15-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. Choose the correct alternative and rewrite the sentences again. **14**
- i) Ozone in lower atmosphere is an example of \_\_\_\_\_  
a) Primary pollutant  
b) Secondary pollutant  
c) Tertiary pollutant  
d) None pollutant
- ii) BOD is used for the measurement of \_\_\_\_\_ pollution.  
a) Atmospheric  
b) Sewage  
c) Thermal  
d) Nuclear
- iii) Soil pollution is caused by \_\_\_\_\_  
a) Aerosol  
b) Ozone  
c) Acid rain  
d) PAN
- iv) Superbugs are \_\_\_\_\_  
a) Synthetic bugs  
b) Bacteria  
c) Radionuclides  
d) Industries
- v) Aquatic life is damaged by \_\_\_\_\_  
a) Sound pollution  
b) Air pollution  
c) Thermal pollution  
d) All of these
- vi) Fluorocarbons are released in the atmosphere by \_\_\_\_\_  
a) Acid rain  
b) Automobile  
c) Jet airplanes  
d) Strong wind

P.T.O.



- vii) \_\_\_\_\_ is defined as capacity to do work.  
a) Surface tension    b) Porosity  
c) Viscosity    d) Energy
- viii) Disease not caused by water pollution is \_\_\_\_\_  
a) Jaundice                          b) AIDS                          c) Cholera                          d) Dysentery
- ix) \_\_\_\_\_ is present in the largest percentage in the biosphere.  
a) Carbon                          b) Hydrogen                          c) Nitrogen                          d) Oxygen
- x) Fossil fuels are \_\_\_\_\_  
a) Renewable resource    b) Non renewable resource  
c) Inexhaustible Resource    d) Non renewable and exhaustible
- xi) CNG is preferred over LPG because it is \_\_\_\_\_  
a) Costlier than LPG    b) Lighter than LPG  
c) Easy to transport    d) Causes less pollution
- xii) \_\_\_\_\_ is example of non-biodegradable pollutant.  
a) Plastic    b) Sewage  
c) Litter    d) Vegetable waste
- xiii) \_\_\_\_\_ is not the long range effect of radiation.  
a) Genetic change    b) Anaemia  
c) Immediate death    d) Loss of vitality
- xiv) Minamata disease is caused due to pollution of \_\_\_\_\_  
a) Lead    b) Mercury    c) PAN    d) SO<sub>2</sub>

2. Define and explain **any seven** of the given below :

14

- i) Smog
- ii) Water pollution
- iii) Eutrophication
- iv) Thermal pollution
- v) Pedogenesis
- vi) Nuclear fission
- vii) Biomass
- viii) Solar energy
- ix) Enlist air pollutant.

Set P





3. A) Answer **any two** of the following : **10**
- i) Define isotopes and its uses.
  - ii) Explain sources and effect of radiation.
  - iii) Explain in detail catalytic convertor.
- B) Explain in detail sources of soil pollution. **4**
4. Answer **any two** of the following : **14**
- i) Define air pollution and give detailed account on types of air pollutants.
  - ii) Explain in brief Noise pollution.
  - iii) Explain energy plantation-Bioethanol.
5. Answer **any two** of the following : **14**
- i) Explain in brief process of nuclear fission and electricity generation.
  - ii) Write a note on conventional energy sources and its types.
  - iii) Explain in detail marine pollution.
-





- VIII) In *Salmonella typhi*, *Salmonella* represent the  
a) Family      b) Order      c) Genus      d) Species
- IX) The media which contains all ingredients of unknown composition is called as \_\_\_\_\_ media.  
a) Synthetic      b) Semisynthetic  
c) Crude      d) Natural
- X) \_\_\_\_\_ indicator is used in Mac Conkey agar.  
a) Neutral Red      b) Bromothymol Blue  
c) Andrade's      d) Phenolphthalein
- XI) U.V. rays are most effective against bacteria at \_\_\_\_\_ nm.  
a) 265      b) 150      c) 200      d) 390
- XII) Eosin is example of \_\_\_\_\_ stain.  
a) Acidic      b) Basic      c) Neutral      d) Positive
- XIII) Animal tissue culture is example of \_\_\_\_\_ media.  
a) Semi-synthetic      b) Enrichment  
c) Differential      d) Living media
- XIV) Serial dilution technique was introduced by  
a) Robert Koch  
b) Alexander Fleming  
c) Joseph Lister  
d) Tyndall

2. Answer **any seven** of the following :

14

- i) Give different phases of bacterial growth.
- ii) Define disinfection and give its examples.
- iii) Define simple and negative staining.
- iv) Give significance of agar and sodium chloride in media preparation.
- v) Define pasteurization.
- vi) Define synthetic media and give its two examples.
- vii) Hot air oven.
- viii) Pure culture.
- ix) Give methods of cultivation of an aerobes.

Set P



3. A) Answer **any two** of the following : 10
- i) Structure and function of autoclave.
  - ii) Explain Living media with any two examples.
  - iii) Explain Synchronous and Diauxic growth.
- B) Explain Nutritional requirements of microorganisms. 4
4. Answer **any two** of the following : 14
- i) Explain procedure and mechanism of Gram staining.
  - ii) Explain methods of isolation of pure cultures of microorganisms.
  - iii) Explain different methods of sterilization.
5. Answer **any two** of the following : 14
- i) Acid fast staining.
  - ii) Explain different methods of maintenance of pure culture of microorganisms.
  - iii) Explain classification of stains.
-



**SLR-SX – 13**

Seat No.	
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Set **P**

**B.Sc. Biotechnology – I (Semester – II) (New CBCS) Examination, 2017**  
**TAXONOMY (Paper – I)**  
**Taxonomy and Tissue Culture**

Day and Date : Friday, 17-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

1. Multiple choice questions.

**14**

- 1) Which one is a true fish ?  
a) Jelly fish            b) Star fish            c) Dog fish            d) Silver fish
- 2) Which of the following is a group of invertebrate animals ?  
a) Mammalia            b) Pisces            c) Reptilia            d) Arthropoda
- 3) A plant has woody stem and its leaves shows reticulate venation  
a) Gymnosperm    b) Monocot            c) Dicot            d) Pteridophytes
- 4) Which of the following are called 'Amphibian' of plant kingdom ?  
a) Bryophytes            b) Algae            c) Pteridophytes    d) Gymnosperm
- 5) A group of similar plants which breed freely among themselves constitute a  
a) Species            b) Family            c) Order            d) Genus
- 6) The five kingdom arrangements of organisms was proposed by  
a) Whittakar            b) John Ray            c) Whitter            d) Watson
- 7) An example for the artificial system of classification  
a) Bentham and Hooker            b) Linneaus system  
c) Engler and Prantl            d) Hutichson
- 8) Modern classification is based on  
a) Physiology            b) Fossils            c) Phylogeny            d) Morphology

**P.T.O.**



- 9) The ability of bacteria to change their morphological form frequently is termed as
- Lysogeny
  - Pleomorphism
  - Alteromorphism
  - None of these
- 10) A system of classification based on all important morphologically characters is termed as
- Artificial system
  - Natural system
  - Genetic system
  - Both a) and b)
- 11) The primary grouping of protozoa is based upon their
- Feeding habits
  - Mode of reproduction
  - Mode of locomotion
  - Mode of nutrition
- 12) Taxon is
- a genus
  - a species
  - a taxonomic unit
  - a taxonomic category of any rank
- 13) Fungi which grow on dung are termed as
- Coprophilous
  - Terricolous
  - Sacxicolous
  - Saxiphilous
- 14) Bilateral symmetry is seen in the body organisation of
- only chordates
  - vertebrates only
  - vertebrates, annelids, arthropods and cnidarians
  - annelids, arthropods and vertebrates
2. Answer **any seven** of the following : **14**
- Give the characteristics of porifera.
  - Write a note on taxonomy.
  - Write a note on Numerical taxonomy.
  - Explain the general characteristics of Bacteria.
  - Give the economic importance of fungi.
  - Write a note on Bryophytes.
  - Explain the general characteristics of Lichens.
  - Distinguish between aves and mammals.
  - Draw a neat and labelled diagram of amoeba.



3. A) Answer **any two** of the following : 10
- i) Give salient features of Platyhelminthes.
  - ii) Describe aim and principles of taxonomy.
  - iii) Give the general characteristics of pteridophytes in brief.
- B) Explain the salient features of cephalochordata with proper example. 4
4. Answer **any two** of the following : 14
- i) Explain criteria for bacterial classification.
  - ii) Describe classification of fungi in detail.
  - iii) Give salient features of Amphibia.
5. Answer **any two** of the following : 14
- i) Explain in detail Phenetic and phylogenetic classification.
  - ii) Give brief account on Pisces.
  - iii) Describe the different classes of phylum Annelida.
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SLR-SX – 14

Seat No.	
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Set **P**

**B.Sc. (Biotechnology) (Semester – II) (New-CBCS) Examination, 2017**  
**TAXONOMY AND TISSUE CULTURE**  
**Paper – II : Tissue Culture**

Day and Date : Saturday, 18-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. Rewrite the following sentences by choosing correct alternatives : **14**
- 1) The synthesis of cytokinin is thought to occur mainly in the  
a) Root tips      b) Shoot tip      c) Leaf tip      d) Young fruit
  - 2) Stomata were more open in plants grown in presence of higher \_\_\_\_\_  
concentration.  
a) Sodium      b) Calcium      c) Magnesium      d) Potassium
  - 3) After disaggregation of tissue and culturing them we get  
a) Continuous cell line      b) Secondary culture  
c) Primary culture      d) Clumps of cells
  - 4) \_\_\_\_\_ is the largest organ in human body.  
a) Intestine      b) Heart      c) Lungs      d) Skin
  - 5) \_\_\_\_\_ method is quick and cheap method of cell separation.  
a) Physical      b) Clinical      c) Enzymatical      d) Laboratory
  - 6) Cobalt and Nickel inhibit \_\_\_\_\_ synthesis.  
a) Gibberrelin      b) Ethylene      c) Cytokinin      d) Auxin
  - 7) \_\_\_\_\_ described procedure to obtain passaged monolayer.  
a) Carrel      b) Haberlandt      c) Dulbecco      d) Eagle

P.T.O.





- 8) Most important protein required for growth of animal cell is  
a) Karetin          b) Transferin      c) Casein          d) Albumin
- 9) \_\_\_\_\_ cells have finite life span on artificial medium.  
a) Normal    b) Tumor  
c) Cancerous                                        d) Defected
- 10) Microelements are essential as \_\_\_\_\_ for many biochemical reactions.  
a) Enzymes                                         b) Catalysts  
c) Co-factor                                        d) Nitrogen source
- 11) Highest concentration of auxin exist at the  
a) Growing tips of plants                     b) Leaves  
c) In xylem                                         d) Base of any plant organ
- 12) \_\_\_\_\_ of cultured cell is increased by attachment of cells to substrate.  
a) Growth                                         b) Density  
c) Encourage dependency                     d) Efficiency
- 13) Most common measurement of viability is based on  
a) Membrane integrity                         b) Dye exclusion assay  
c) Dye uptake assay                            d) Metabolic assay
- 14) \_\_\_\_\_ use bottles first time to culture animal cells.  
a) Harrison          b) Carrel          c) G. Morel          d) Skoog

2. Answer the following (**any seven**) :

14

- 1) Write a note on growth room in PTC.
- 2) Describe in brief acclimatization.
- 3) Write a note on stage I of micropropagation.
- 4) Write a note on role of inverted microscope.
- 5) Define secondary cell line.
- 6) Write a short note on micropipettes.
- 7) Write a note on history of animal tissue culture.
- 8) Write a note on green house.
- 9) Define Totipotency.



3. A) Answer the following (**any two**) : **10**
- 1) Discuss production of haploid plants by anther culture.
  - 2) Explain cold trypsinization.
  - 3) Give details of instruments used in ATC laboratory.
- B) Write a short note on cytotoxicity assay. **4**
4. Answer the following (**any two**) : **14**
- 1) Explain laboratory design for plant tissue culture.
  - 2) Discuss synthetic media for animal tissue culture.
  - 3) Explain in detail suspension culture.
5. Answer the following (**any two**) : **14**
- 1) Give details of pollen culture.
  - 2) Discuss the role of different constituents of serum.
  - 3) Define viability and explain membrane integrity and dye exclusion assay.
-

**SLR-SX – 15**

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**B.Sc. – I (Biotechnology) (Semester – II) (CBCS) (New) Examination, 2017**  
**BIOCHEMISTRY AND CELL PHYSIOLOGY**  
**Paper – I : Biochemistry**

Day and Date : Monday, 20-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Marks : 70

- Instructions :** 1) **All** questions carry **equal** marks.  
2) Figures to **right** indicate **full** marks.  
3) Draw **neat** and labeled diagrams.

1. Rewrite the following sentences by using correct alternative : **14**
- 1) In egg \_\_\_\_\_ type of protein is present.  
a) collagen    b) keratin  
c) ovalbumin    d) myoglobin
- 2) \_\_\_\_\_ is a blood sugar.  
a) glucose                  b) sucrose                  c) fructose                  d) lactose
- 3) One helical turn of B form of DNA has \_\_\_\_\_ number of base pairs.  
a) 11                                  b) 12                                  c) 9                                  d) 10
- 4) \_\_\_\_\_ lipids are photosynthetic pigments found in plants and play important role in photosynthesis.  
a) steroids    b) fatty acids  
c) carotene    d) terpenes
- 5) Amylase enzyme carry out the hydrolysis of \_\_\_\_\_  
a) lactose    b) starch  
c) glycogen    d) maltose
- 6) pH at which amino acid releases proton is known as \_\_\_\_\_  
a) pK value    b) pl value  
c) pZ value    d) isoelectric point
- 7) In triacylglycerol \_\_\_\_\_ number of fatty acids are attached to glycerol molecule.  
a) 1                                  b) 2                                  c) 3                                  d) 4

P.T.O.



- 8) \_\_\_\_\_ oxygen carrying protein in human beings.  
a) Insulin  
b) Haemoglobin  
c) Oxytocin  
d) Albumin
- 9) Lysine is example of \_\_\_\_\_ amino acid.  
a) basic  
b) acidic  
c) neutral  
d) aliphatic
- 10) Deficiency of retinol causes \_\_\_\_\_ disease.  
a) berry berry  
b) diabetes  
c) keratomalacia  
d) scurvy
- 11) Nucleotides consist of \_\_\_\_\_  
a) pentose sugar  
b) pentose sugar, phosphate  
c) pentose sugar, phosphoric acid and nitrogen base  
d) phosphate and nitrogen base
- 12) \_\_\_\_\_ sugar is present in milk.  
a) glucose  
b) galactose  
c) lactose  
d) ribose
- 13) \_\_\_\_\_ carbohydrate is not further hydrolysed.  
a) monosaccharide  
b) disaccharide  
c) oligosaccharide  
d) polysaccharide
- 14) m-RNA is also known as \_\_\_\_\_  
a) hn-RNA  
b) soluble RNA  
c) supernatant RNA  
d) adaptor RNA

2. Answer the following (**any 7**) :

14

- i) Define carbohydrates and give one example of carbohydrate.
- ii) Explain peptide bond.
- iii) Write a note on fatty acids and enlist types of fatty acids.
- iv) Give the diagrammatic representation of m-RNA.
- v) Define vitamins.
- vi) Write a note on starch.
- vii) Explain secondary structure of protein.
- viii) Draw the structure of cholesterol.
- ix) Write any two components of nucleic acid.



3. A) Answer the following (**any 2**) : **10**
- i) Write a note on classification of proteins.
  - ii) Give source, requirement and biochemical role of retinol.
  - iii) Write a note on fluid mosaic model of plasma membrane.
- B) Write in brief isomerization concept with its types. **4**
4. Answer **any two** of the following : **14**
- i) Write a note on classification of amino acids on the basis of polarity. Draw the structure of any five amino acids.
  - ii) Give a brief account on sucrose and lactose.
  - iii) Write structure and function of fatty acids, triglycerides, phospholipids.
5. Answer **any two** of the following : **14**
- i) Write a note on Watson and Crick model of DNA.
  - ii) Draw the structure of Glyceraldehyde, dihydroxy acetone, ribose sugar and write their functions.
  - iii) Explain titration curve for glycine and histidine amino acids.
-





- 7) Microvilli in the small intestine is meant for\_\_\_\_\_
- a) Secretion            b) Absorption            c) Draining            d) Filtration
- 8) \_\_\_\_\_ cells are responsible for secretion of mucus.
- a) Oxyntic            b) Serous            c) Epithelial            d) Goblet
- 9) \_\_\_\_\_ is known as root inducing hormone.
- a) Auxin            b) Cytokinin            c) ABA            d) Ethylene
- 10) \_\_\_\_\_ is known as ovulation hormone.
- a) ICSH            b) FSH            c) GTH            d) LH
- 11) \_\_\_\_\_ is conversion of nitrogen to ammonia.
- a) Nitrogen fixation            b) Ammonia fixation  
c) Nitrogenation            d) Nitrification
- 12) \_\_\_\_\_ is act as chemical messenger in endocrine system.
- a) Neurotransmitter            b) Enzyme  
c) Ribozyme            d) Hormone
- 13) \_\_\_\_\_ is known as critically essential elements.
- a) Nitrogen            b) Phosphorous  
c) Potassium            d) All of these
- 14) \_\_\_\_\_ is not a micronutrient.
- a) Copper            b) Zinc            c) Carbon            d) Boron

2. Answer the following (**any 7**) :

**14**

- i) Write a note on Jasmonic acids.
- ii) What is cuticular transpiration ?
- iii) What is Photoperiodism ?
- iv) Write a note on conducting system of heart.
- v) Draw neat labeled diagram of Nephron.
- vi) What is reflex arc ?
- vii) Write a note on vernalisation.
- viii) What is symplast pathway ?
- ix) Write a note on lymph.

3. A) Answer **any two** of the following : **10**
- i) Describe human excretory system and add note on mechanism of urine formation.
  - ii) Explain structure, synthesis and function of Gibberellins and ABA.
  - iii) Describe human digestive system with neat labeled diagram.
- B) Explain the structure and function of neuron. **4**
4. Answer **any two** of the following : **14**
- i) Explain various mechanisms of absorption of elements.
  - ii) Describe human nervous system.
  - iii) Describe types, phases and factors affecting seed dormancy.
5. Answer **any two** of the following : **14**
- i) Explain with examples role of micronutrients and macronutrients in plants.
  - ii) Describe double circulation with neat labeled diagram.
  - iii) Describe human respiratory system with neat labeled diagram.
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**B.Sc. – I (Biotechnology) (Semester – II) (New-CBCS) Examination, 2017**  
**BIOMETRY AND COMPUTER SCIENCE**  
**Paper – I : Biometry**

Day and Date : Wednesday, 22-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

- Instructions:** 1) **All questions are compulsory.**  
2) Figures to **right** indicates **full** marks.  
3) **Use of basic calculator is allowed.**  
4) **Use graph paper wherever necessary.**

1. Rewrite the following sentences by using correct alternative :

14

- 1) The solution of the equation  $3x^2 - 6 = 0$  is \_\_\_\_\_  
a) An imaginary number                      b) An integer  
c) A rational number                         d) An irrational number
- 2) The conjugate of the complex number  $4i - 3$  is \_\_\_\_\_  
a)  $4i + 3$                       b)  $3 - 4i$                       c)  $-3 + 4i$                       d)  $-3 - 4i$
- 3) If  $A = \{5, 7, 8, 4\}$  and  $B = \{5, 2, 3, 4\}$  then  $A - B =$  \_\_\_\_\_  
a)  $\{7, 8\}$                       b)  $\{0, 5\}$                       c)  $\{ \}$                               d)  $\{4, 5\}$
- 4) A function  $f$  is said to be an even function if  
a)  $f(x) = f(-x)$                               b)  $f(-x) = -f(x)$   
c)  $f(x) = 2x$                                  d)  $f(x) = 2^x$
- 5)  $\lim_{x \rightarrow 0} (x + \sec x) =$  \_\_\_\_\_  
a) 0                                      b) 1                                      c) 2                                      d) -1
- 6)  $f(x) = \frac{5}{2x - 2}$  is discontinuous at  $x =$  \_\_\_\_\_  
a) 0                                      b) 1                                      c)  $\frac{1}{2}$                                       d) 5



- 7) If  $f(x) = -5\sin x$ , then  $f'(0)$  is \_\_\_\_\_  
a) 1                      b) 5                      c) 0                      d) -5
- 8) A function  $f$  is increasing at  $a$ , if  
a)  $f'(a) > 0$                       b)  $f(a) > 0$   
c)  $f(a) < 0$                       d)  $f'(a) < 0$
- 9) If  $\int f(x)dx = g(x) + c$  then  
a)  $f(x) = g(x)$                       b)  $f'(x) = g(x)$   
c)  $f(x) = g'(x)$                       d)  $g(x) = c$
- 10)  $\int_1^2 3x^2 dx =$  \_\_\_\_\_  
a) 8                      b) 7                      c) 9                      d) 24
- 11) If  $f(x, y) = 3x$  then  $\frac{\partial f}{\partial y} =$  \_\_\_\_\_  
a) 3                      b)  $3y$                       c)  $3xy$                       d) 0
- 12) Degree of the differential equation  $\left(\frac{d^2y}{dx^2}\right)^3 - \left(\frac{dy}{dx}\right)^5 + y = 5$  is  
a) 3                      b) 2                      c) 5                      d) 6
- 13) If  $A$  is matrix of order  $2 \times 3$ ,  $B$  is matrix of order  $3 \times 2$ , then order of  $AB$  is \_\_\_\_\_  
a)  $6 \times 6$                       b)  $4 \times 1$                       c)  $2 \times 2$                       d)  $3 \times 3$
- 14)  $G = \begin{bmatrix} 3 & 0 & 0 \\ 0 & 6 & 0 \\ 0 & 0 & 9 \end{bmatrix}$  is \_\_\_\_\_  
a) Scalar matrix                      b) Rectangular matrix  
c) Diagonal matrix                      d) Skew-symmetric matrix



2. Attempt **any seven** of the following :

14

1) Find the value of  $i^4 + i^5 - i^6 - i^7$ .

2) If  $A = \{5, 7\}$  then find power set  $P(A)$  of  $A$ .

3) If  $f(x) = 2x + 3$  and  $g(x) = 5x$  then find  $f \circ g$ .

4) If  $\lim_{x \rightarrow p} \frac{x^5 - p^5}{x - p} = 80$ , find  $p$ .

5) If  $f(x) = \begin{cases} 5 + 3x & \text{for } x \neq 2 \\ 8 & \text{for } x = 2 \end{cases}$ , then examine the continuity of function at  $x = 2$ .

6) If  $y = x^2 2^x$ , then find  $\frac{dy}{dx}$ .

7) Evaluate  $\int 3 \sin x - 4 \cos x dx$ .

8) Evaluate  $\int_0^1 4^x dx$ .

9) Solve differential equation  $y - x \frac{dy}{dx} = 0$ .

3. A) Attempt **any two** of the following :

10

1) Evaluate  $\lim_{x \rightarrow 5} \frac{x^2 - 9x + 20}{x^2 - 6x + 5}$ .

2) Differentiate  $\frac{\cos x}{1 - x^2}$  with respect to  $x$ .

3) Evaluate  $\int x^2 \cos x dx$ .

B) Solve the following :

4

If  $A = \begin{bmatrix} 2 & 3 & -1 \\ 1 & 1 & 0 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 & 1 \\ 3 & -4 \\ 2 & 5 \end{bmatrix}$  then find  $AB$ .



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

14

- 1) If  $z_1 = 1 - 2i$ ,  $z_2 = 4 + 3i$ ,  $z_3 = 2 + 3i$  and  $z_4 = 5 - 3i$  then find  $\frac{z_1 + \bar{z}_2}{\bar{z}_4 - z_3}$ .
- 2) If  $X = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ ,  $A = \{3, 4, 5, 6, 7\}$ ,  $B = \{1, 2, 5, 6\}$ ,  
 $C = \{6, 7, 8, 9\}$  then verify  $A \cap (B' \cup C) = (A \cap B') \cup (A \cap C)$ .
- 3) Find the maximum and minimum value of the function  
 $f(x) = 2x^3 - 9x^2 + 12x + 4$ .

5. Attempt **any two** of the following :

14

- 1) Draw the graph of linear function  $y = f(x) = 3x - 4$ .

2) If  $f(x) = \begin{cases} \frac{\sin 4x}{5x} + a & \text{for } x > 0 \\ x + 4 - b & \text{for } x < 0 \\ 1 & \text{for } x = 0 \end{cases}$  is continuous at  $x = 0$  then find  $a, b$ .

- 3) Solve the equations  $x + 3y + 3z = 12$ ,  $x + 4y + 4z = 15$ ,  $x + 3y + 4z = 13$  using reduction method or Gaussian Elimination method of matrix.
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SLR-SX – 18

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**B.Sc. – I (Semester – II) (Biotechnology) Examination, 2017**  
**BIOMETRY AND COMPUTER SCIENCE (Paper – II)**  
**Computer Science (New) (CBCS Pattern)**

Day and Date : Thursday, 23-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. Choose the correct alternative from the following and rewrite the sentence. **14**
- 1) E-mail stands for \_\_\_\_\_
    - a) Electronic mail
    - b) Electronically mail
    - c) Exchange mail
    - d) None
  - 2) 1 byte is equal to \_\_\_\_\_ bits.
    - a) 4
    - b) 8
    - c) 32
    - d) 64
  - 3) The protocol that web servers and clients used to communicate with each other is called
    - a) HTTP
    - b) HTML
    - c) SMTP
    - d) URL
  - 4) \_\_\_\_\_ is a step by step instructions which are written for solving a problem.
    - a) Algorithm
    - b) Flow chart
    - c) Picture chart
    - d) Picture code
  - 5) To paste, the shortcut key is \_\_\_\_\_
    - a) Ctrl + X
    - b) Ctrl + P
    - c) Ctrl + V
    - d) Ctrl + C
  - 6) \_\_\_\_\_ is a default file name of PowerPoint.
    - a) Book1
    - b) Document1
    - c) Presentation1
    - d) Table1

P.T.O.



- 7) ROM stands for \_\_\_\_\_  
a) Read OMR Memory                      b) Read Only Memory  
c) Random Operating Memory            d) None
- 8) \_\_\_\_\_ devices generate result form computer.  
a) Output                                      b) Input  
c) Storage                                      d) Utility
- 9) The processed data is called \_\_\_\_\_  
a) Data    b) Software  
c) Information                                  d) Operating system
- 10) \_\_\_\_\_ topology has common cable.  
a) Ring    b) Bus  
c) Star    d) Hybrid
- 11) \_\_\_\_\_ topology has central controller point.  
a) Bus    b) Star  
c) Tree    d) Square
- 12) The protocol that is used to transfer file is \_\_\_\_\_  
a) FTP    b) HTML  
c) HTTP     d) SMTP
- 13) For DBMS \_\_\_\_\_ software is used.  
a) MS Word                                      b) MS Excel  
c) MS PowerPoint                              d) MS Access
- 14) Rearranging the data in a sequence is called \_\_\_\_\_  
a) Updating                                      b) Editing  
c) Batching                                        d) Sorting

2. Answer **any seven** of the following :

**14**

- i) Explain Application Software with example.
- ii) Explain how you will change font and font style in word.
- iii) Enlist any four input devices.
- iv) Explain ALU and Control Unit.
- v) Define the following terms :
  - 1) Information
  - 2) Data.

**Set P**



- vi) Explain use of Modem in networking.
  - vii) Explain Wide Area Network.
  - viii) Explain the need of database.
  - ix) Explain any two methods to calculate total in excel.
3. A) Write short notes on **any two** of the following : **10**
- i) Explain the use of Internet.
  - ii) Explain how will you prepare chart in excel.
  - iii) Explain basic components of Digital Computer.
- B) Write a note on Internet. **4**
4. Answer **any two** of the following : **14**
- i) What is Computer ? Explain types of Computer.
  - ii) Explain Network Topology and its types.
  - iii) Define the term Flow chart and explain different symbols of flow chart.
5. Answer **any two** of the following : **14**
- i) What do you mean by Algorithm ? Write an algorithm to find greatest number among two numbers.
  - ii) Explain modem and its types.
  - iii) Explain Intranet and Extranet.
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**SLR-SX – 19**

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Set **P**

**B.Sc. – I (Biotechnology) (Semester – II) (CGPA) Examination, 2017**  
**ENGLISH (Comp.) (Old)**  
**On Track : English Skills For Success**

Day and Date : Tuesday, 14-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

1. Complete the following statements by choosing the correct alternatives from those given below them :

**14**

- 1) The word 'workaholic' means
  - a) a person who works hard
  - b) a person who works slowly and slowly
  - c) a person who does not work
  - d) a person who runs away from work
- 2) Wernher von Braun made the lethal
  - a) SLV-3
  - b) V-2
  - c) V-3
  - d) V-11
- 3) The first session of Parliament of Religion was held on
  - a) 11 September 1893
  - b) 11 October 1893
  - c) 11 September 1993
  - d) 11 December 1893
- 4) \_\_\_\_\_ represented the Buddhists of Ceylon in Parliament of Religion.
  - a) Pratap Muzoomdar
  - b) Gandhi
  - c) Dharmapala
  - d) None
- 5) What is the vanishing act Palkhivala writes about
  - a) The removal of poverty
  - b) The disappearance of law and order
  - c) The removal of discrimination
  - d) The disappearance of dissenters

**P.T.O.**





- 6) The primary idea of human rights involves  
a) rights against the government    b) rights of the government  
c) rights for the government        d) rights formulated by the government
- 7) Ralph Emerson was also a advocate of  
a) The superstition                    b) The transcendentalism  
c) The western style                  d) None
- 8) Ralph Emerson was \_\_\_\_\_ poet.  
a) An American    b) An Indian    c) An English    d) The French
- 9) The word 'bubble house' in 'Full Moon' means  
a) The Sun            b) The Moon    c) The Earth    d) The Sky
- 10) As the time passed, our perception of the moon has  
a) Changed                                b) Remained as it was  
c) Disturbed people                    d) None
- 11) This is the final \_\_\_\_\_ of the items.  
a) List                    b) Least                c) Lest                    d) Little
- 12) Mr. Padolkar congratulated Raju for his  
a) Princeple            b) Principles        c) Prencipal            d) Principale
- 13) Mrs. Bhujade cannot drink \_\_\_\_\_ coffee without your company.  
a) Her                    b) His                    c) Their                  d) Your
- 14) The correct antonym of 'expensive' is  
a) best                    b) chief                  c) poor                    d) cheap

2. Answer in brief **any seven** of the following :

**14**

- 1) What kind of a personality was Wernher von Braun, according to Dr. Kalam ?
- 2) What is 'flow' according to Dr. Kalam ?
- 3) How did J. H. Wright help Swami Vivekananda ?
- 4) How did Swami Vivekanand begin his speech in Chicago ?
- 5) What is the noble maxim by Palkhivala ?
- 6) Why does Palkhivala say that the world continues to be 'less than half free' ?
- 7) Write a note on Dr. Kalam as scientist.
- 8) What happened to the first V-2 missile when it was first tested ?

**Set P**



3. A) Write short answers on **any two** of the following : **8**
- 1) What is the message of the poem 'Brahma' ?
  - 2) How does Hayden lament over the Moon's fate ?
  - 3) Explain in short the concept of 'Brahma' by Emerson in the poem 'Brahma'.
- B) Write paragraphs on **any two** of the following : **6**
- 1) As a Principal of College, write a notice informing students about poetry reading competition. Mention date and events.
  - 2) What do you mean by minutes ?
  - 3) What is an agenda ?
4. Answer **any one** of the following questions : **14**
- A) You are Dr. Balkrishnan, Secretary of Himalaya Academy. The well known speaker has been called to guide students who prepare for competitive examinations. Write a notice and agenda informing members of the academy. Imagine necessary details.
- B) You have received an e-mail letter of appointment for the post of Bank Manager in D.B.N. Cooperative Bank, Pune. Write an email letter accepting the offer.
5. Prepare a C.V. for the post of Assistant Sales Executive in a renowned company. **14**
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**B.Sc. – I (Semester – II) (Old-CGPA) Examination, 2017**  
**BIOTECHNOLOGY**  
**Environmental Pollution and Microbial Techniques**

Day and Date : Wednesday, 15-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

- N.B :** 1) **All questions are compulsory.**  
2) Figures to **right** indicate **full** marks.  
3) Draw **neat** diagram **whenever** necessary.

PAPER – I  
(Environmental Pollution)

1. Multiple choice questions.

5

- 1) Primary air pollutant contributing to ozone layer depletion is
  - a) SO<sub>2</sub>
  - b) CFC
  - c) CH<sub>4</sub>
  - d) H<sub>2</sub>S and CO<sub>2</sub>
- 2) \_\_\_\_\_ pollutant was responsible for the Minamata disease ?
  - a) Mercury
  - b) Lead
  - c) Cadmium
  - d) Zinc
- 3) Air (Prevention and control of pollution) Act was launched in
  - a) 1974
  - b) 1986
  - c) 1972
  - d) 1981
- 4) In anaerobic biogas generation process \_\_\_\_\_ gas is produced.
  - a) CO<sub>2</sub>
  - b) H<sub>2</sub>S
  - c) CH<sub>4</sub>
  - d) SO<sub>2</sub>
- 5) Nuclear energy waste causes \_\_\_\_\_ effects on human being.
  - a) Mutagenic
  - b) Carcinogenic
  - c) Teratogenic
  - d) All the above

2. Answer **any five** of the following.

10

- 1) What is Pyrolysis ?
- 2) Enlist renewable and non renewable sources of energy.
- 3) What is nuclear fission ?
- 4) Explain green house effect.
- 5) What are point and non point sources of water pollution ?
- 6) What is salinity ?
- 7) Write down effects of ozone layer depletion.

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3. A) Write down short note on **any two** of the following. **10**
- 1) Write down case study of chernobyl nuclear disaster.
  - 2) What is BOD and COD ? Write down difference between BOD and COD.
  - 3) Explain Air (Prevention and Control of Pollution) Act.
- B) Answer **any one** of the following. **10**
- 1) What is soil pollution ? Write down the sources and effects of soil pollution.
  - 2) What are sources of nuclear pollution ? Write down effects and disposal methods of nuclear waste.

PAPER – II  
(Microbial Techniques)

1. Rewrite the following sentences by choosing correct alternatives given below : **5**
- i) \_\_\_\_\_ method is used for cell wall staining.  
a) Giemsa's      b) Gram's      c) Manvel's      d) Chance's
  - ii) Nigrosine is an example of \_\_\_\_\_ stain.  
a) Acidic      b) Basic      c) Neutral      d) None of these
  - iii) \_\_\_\_\_ growth is characterised by a double growth cycle consisting of two exponential phases separated by a distinct lag phase.  
a) Synchronous      b) Continuous      c) Diauxic      d) None of these
  - iv) The organism which use carbondioxide as carbon source and light as an energy source belongs to  
a) Photoautotroph      b) Chemoautotroph  
c) Photoheterotroph      d) Chemoheterotroph
  - v) \_\_\_\_\_ works as a solidifying agent in culture media.  
a) Sodium Chloride      b) Peptone  
c) Agar-Agar      d) Yeast extract
2. Answer **any five** of the following : **10**
- i) Define pasteurisation and give its different methods.
  - ii) Define disinfection and give its examples.
  - iii) Define diauxic and synchronous growth.
  - iv) Define natural and synthetic media and give its example.
  - v) In which media it is used and give its function – Neutral red and bromothymol blue ?



- vi) Give different methods used for maintenance of pure culture.
- vii) Give difference between dry heat and moist heat used for sterilization.

3. A) Write short notes on **any two** of the following : **10**

- 1) Spread plate and pour plate techniques.
- 2) Methods used for isolation of anaerobic bacteria.
- 3) Mechanism of Gram's staining.

B) Answer **any one** of the following : **10**

- 1) Write an account on nutritional requirements of microorganisms.
  - 2) Write an account on different growth phases in bacterial culture.
-



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**B.Sc. – I (Biotechnology) (Semester – II) (CGPA) (Old) Examination, 2017  
BIOCHEMISTRY AND CELL PHYSIOLOGY**

Day and Date : Thursday, 16-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

Paper – I  
**(Biochemistry)**

1. Rewrite the following sentence by choosing the correct answer : 5
- 1) \_\_\_\_\_ is an example of saturated fatty acid.  
a) Arachidonic acid                      b) Lenoleic acid  
c) Oleic acid                                d) Palmitic acid
  - 2) DNA stands for  
a) Dioxyribose Nucleic Acids  
b) Dideoxyribose Nucleic Acid  
c) Deoxyribose Nucleic Acids  
d) Ribose Nucleic Acid
  - 3)  $\alpha$ -helix represent the \_\_\_\_\_ structural level of protein.  
a) Primary            b) Secondary        c) Tertiary            d) Quaternary
  - 4) \_\_\_\_\_ is a coenzyme form of thiamine.  
a) Thiamine pyrophosphate            b) Biotin  
c) Pyrodoxal phosphate                d) NAD<sup>+</sup>
  - 5) \_\_\_\_\_ is an example of diasaccharide.  
a) Sucrose            b) Glucose            c) Ribose                d) Erythrose

P.T.O.



2. Answer **any five** of the following : **10**
- i) Draw the structure of glucose and fructose.
  - ii) Enlist the four examples of monosaccharide's.
  - iii) Explain secondary structure of proteins.
  - iv) Define lipids and give its one example.
  - v) Write a note on chargraff's rule.
  - vi) Define nucleosides and nucleotides.
  - vii) Write two examples of sulfur containing amino acids.
3. Write short note on **any two** of the following : **10**
- i) Explain in detail Watson and crick model of DNA and draw its neat labelled diagram.
  - ii) Write a note on of sucrose and lactose.
  - iii) Give the classification of proteins on the basis of its composition.
4. Answer **any one** of the following : **10**
- i) Define lipids and give the detailed classification of lipids with its functions.
  - ii) Write the biochemical functions and deficiency disorders of water soluble vitamins and fat soluble vitamins.

Paper – II  
**(Cell Physiology)**

1. Rewrite the following sentences by using correct alternative. **5**
- 1) In plants, Cytokinin hormone is responsible for
    - a) Shoot inducing
    - b) Root inducing
    - c) Fruit ripening
    - d) Both shoot and root inducing
  - 2) \_\_\_\_\_ is structural and functional unit of muscles.
    - a) Neuron
    - b) Reflex arc
    - c) Nephron
    - d) Sarcomere
  - 3) \_\_\_\_\_ is responsible for carry oxygenated blood from lungs to left auricle.
    - a) Pulmonary artery
    - b) Pulmonary vein
    - c) Systemic artery
    - d) Systemic aorta
  - 4) \_\_\_\_\_ is responsible for absorption of sodium ions through nephrons.
    - a) Thyroxin
    - b) ADH
    - c) Aldosterone
    - d) TSH
  - 5) Thyrocalcitonin is secreted by \_\_\_\_\_ cells.
    - a) Sertoli
    - b) Parafollicular
    - c) Leydig
    - d) Intertitial



2. Answer the following (**any 5**) : **10**
- i) What is Fixation of Nitrogen ?
  - ii) What is vernalisation ?
  - iii) Write a note on mechanism of breathing.
  - iv) Draw neat labelled diagram of Neuron.
  - v) Explain Regulation of kidney functions.
  - vi) Hormones of gastro-intestinal tract.
  - vii) What is double circulation ?
3. Write short notes on **any two** of the following : **10**
- i) Describe stomatal and cuticular transpiration.
  - ii) Describe C4 Pathway in plants.
  - iii) Describe internal structure human heart with neat labelled diagram.
4. Answer **any one** of the following : **10**
- i) Explain the structure and function of human respiratory system.
  - ii) Describe human endocrine system with neat labelled diagram.
-





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**B.Sc. – I (Biotechnology) (Semester – II) (CGPA) (Old) Examination, 2017  
BIOMETRY AND TISSUE CULTURE**

Day and Date : Friday, 17-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

- Instructions:** 1) **All questions are compulsory.**  
2) Draw **neat** and labeled diagrams **wherever** necessary.  
3) Figures to **right** indicates **full** marks.  
4) **Use** of basic calculator is **allowed**.  
5) **Use** graph paper **wherever** necessary.

SECTION – I  
(Biometry)

1. Rewrite the following sentences by using correct alternative : 5
- 1) The solution of the equation  $2x - 5 = 4$  is \_\_\_\_\_  
a) An imaginary number                      b) An integer  
c) A rational number                         d) An irrational number
  - 2) The conjugate of the complex number  $6i$  is \_\_\_\_\_  
a)  $6i$     b)  $-6i$     c)  $0$     d) none of these
  - 3) If  $A = \{6, 5, 4\}$  and  $B = \{2, 3, 4\}$  then  $B - A =$  \_\_\_\_\_  
a)  $\{6, 5\}$                                          b)  $\{3, 2\}$                                          c)  $\{-4, -2, 0\}$                                  d)  $\{-4, -2, \emptyset\}$
  - 4) If  $f(x) = 5\cos x$ , then  $f'(0)$  is \_\_\_\_\_  
a)  $1$     b)  $5$     c)  $0$     d)  $-5$
  - 5) If  $A$  is matrix of order  $3 \times 4$ ,  $B$  is matrix of order  $4 \times 3$ , then order of  $BA$  is \_\_\_\_\_  
a)  $12 \times 12$                                       b)  $16$     c)  $4 \times 4$     d)  $3 \times 3$
2. Answer the following (any 5) : 10
- i) Define discrete variable and give an example.
  - ii) Find the value of  $i^{34} - i^{35} + i^{36} - i^{37}$ .
  - iii) If  $A = \{p, e, n\}$  and  $B = \{b, y\}$ , then find  $A \times B$ .

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iv) If  $\lim_{x \rightarrow a} \frac{x^5 - a^5}{x - a} = 80$ , find a.

v) If  $y = 5x^3 \log x$ , then find  $\frac{dy}{dx}$ .

vi) Evaluate the integral  $\int \left( 7^x - \frac{1}{x^2} \right) dx$ .

vii) If  $A = \begin{bmatrix} x & 8 \\ 4 & 2x \end{bmatrix}$  is singular matrix, then find x.

3. A) Answer **any two** of the following :

10

i) If  $z_1 = 3i + 7$  and  $z_2 = 5 - i$ , then find the values of  $z_1 \cdot \bar{z}_2$  and  $\frac{z_2}{z_1}$ .

ii) If  $A = \{2, 3, 4, 8\}$ ,  $B = \{1, 3, 4, 5, 6\}$ ,  $C = \{4, 5, 6, 7, 8\}$  and the universal set  $X = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ , verify  $B \cup (A \cap C) = (B \cup A) \cap (B \cup C)$ .

iii) Evaluate  $\lim_{x \rightarrow 0} \frac{\sqrt{2x+3} - \sqrt{3}}{5x}$ .

B) Answer **any one** of the following :

10

i) Find the maximum and minimum value of the function  $f(x) = 2x^3 - 3x^2 - 72x + 1$ .

ii) If  $A = \begin{bmatrix} 1 & 1 & 3 \\ 3 & 4 & 9 \\ 2 & 2 & 6 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 & 2 & 1 \\ -1 & 2 & 1 \\ 2 & 1 & -2 \end{bmatrix}$  find Rank of Matrix A and inverse of Matrix B.

SECTION – II  
(Tissue Culture)

1. Rewrite the following sentences by using most correct alternative.

5

i) Laminar air flow has a number of small blower motors to blow air which pass through a number of \_\_\_\_\_ filters.

a) HPLC

b) HP-TLC

c) HEPA

d) NFT

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- ii) Thiamin is \_\_\_\_\_ used as a component of plant tissue culture media.
  - a) Amino acid
  - b) Vitamin
  - c) Sugar
  - d) Growth hormone
- iii) The part of a plant used for culturing is called \_\_\_\_\_.
  - a) Callus
  - b) Graft
  - c) Stock
  - d) Explant
- iv) Disaggregation of explanted animal cells and subsequent plating out of the dispersed cells was first demonstrated by \_\_\_\_\_.
  - a) Rous
  - b) Sanford
  - c) Parker
  - d) Morgan
- v) \_\_\_\_\_ is one of the minimum requirements in Animal Tissue Culture facilities.
  - a) Sterile area
  - b) Storeroom for bulk plastics
  - c) Microscope room
  - d) Darkroom

2. Answer the following (**any 5**) : **10**

- i) What is cytodifferentiation ?
- ii) Define totipotency and give an application of it.
- iii) What is ovary culture ? Give an application of it.
- iv) Explain the principle of autoclave.
- v) What is anchorage dependence of growth ?
- vi) Differentiate between synthetic media and natural media.
- vii) What is a continuous cell line ?

3. A) Answer **any two** of the following : **10**

- i) Write about the components of plant tissue culture media.
- ii) Which are the instruments used in animal tissue culture laboratory ?
- iii) Explain the concept of trypsinization.

B) Answer **any one** of the following : **10**

- i) Plant tissue culture lab organization.
- ii) Initiation and maintenance of primary cell line.

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**B.Sc. – I (Semester – II) (Biotechnology) (Old CGPA) Examination, 2017  
TAXONOMY AND COMPUTER SCIENCE**

Day and Date : Saturday, 18-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

**PAPER – I (Taxonomy)**

1. Choose the correct alternative from the following and rewrite the sentence : **5**
- 1) Elementary body is the significant characteristics of
    - a) Archaeobacteria
    - b) Actinomycetes
    - c) Mycoplasma
    - d) Chlamydia
  - 2) \_\_\_\_\_ is an example of Archaeobacteria.
    - a) Coxiella
    - b) Rochalimea
    - c) Lichens
    - d) Methanogenic bacteria
  - 3) Angiosperm differs from Gymnosperm in having
    - a) Fruits
    - b) Cotyledon
    - c) Tracheids
    - d) Broad leaves
  - 4) Rat is an example of class
    - a) Mammalia
    - b) Aves
    - c) Amphibia
    - d) Reptilia
  - 5) \_\_\_\_\_ is an example of phylum Echnodermata.
    - a) Parrot
    - b) Lizard
    - c) Star Fish
    - d) Scoliodon
2. Answer **any five** of the following. **10**
- i) Economic importance of fungi.
  - ii) Features of Mammalia.
  - iii) Phylogenetic taxonomy.
  - iv) Write a note on Cephalochordata.

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- v) General characters of Bryophytes.
- vi) Economic Importance of Gymnosperms.
- vii) Binomial nomenclature.

3. A) Write short notes on **any two** of the following. **10**

- i) General characters of Anthropoda.
- ii) Write detail account on Angiosperms.
- iii) Rickettsia.

B) Answer **any one** of the following. **10**

- i) Salient features of protozoa.
- ii) Aims and principles of taxonomy.

### PAPER – II (Computer Science)

1. Choose the correct alternative from the following and rewrite the sentence : **5**

1) \_\_\_\_\_ is a default file name of excel.

- a) Book 1 b) Document 1
- c) Presentation 1 d) Table 1

2) RAM stands for

- a) Read access memory
- b) Random access memory
- c) Random accurate memory
- d) None

3) \_\_\_\_\_ devices accept data and instructions from the user.

- a) Output b) Input c) Storage d) Utility

4) The protocol that web servers and clients used to communicate with each other is called

- a) HTTP b) HTML c) SMTP d) URL

5) \_\_\_\_\_ topology has central controller point.

- a) Ring b) Bus c) Star d) Hybrid



2. Answer **any five** of the following. 10
- i) Explain software with its types.
  - ii) Explain how you will use format painter in word.
  - iii) Enlist any two input and output devices.
  - iv) Explain features of word.
  - v) Define the following terms – 1) Modem 2) Network.
  - vi) Explain bits and bytes.
  - vii) Explain Medium Area Network.
3. A) Write short notes on **any two** of the following. 10
- i) Explain the transmission modes in networking (any two).
  - ii) Explain how you will add custom animation in PowerPoint.
  - iii) Explain benefits of networking.
- B) Answer **any one** of the following. 10
- i) What is computer ? Explain anatomy of computer.
  - ii) Explain page formatting in word document.
-



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**B.Sc. II (Biotechnology) (Semester – III) (New CBCS) Examination, 2017**  
**INHERITANCE BIOLOGY**

Day and Date : Friday, 24-11-2017  
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

- Instructions :** 1) *All questions carry equal marks.*  
2) *Figures to right indicate full marks.*  
3) *Draw neat and labeled diagrams.*

1. Rewrite the following sentences by using correct alternative : 14
- 1) Carl Correns studied extra-nuclear inheritance in
    - a) BGA
    - b) Maize
    - c) Four 'O' clock plant
    - d) Cyanobacteria
  - 2) In \_\_\_\_\_ diseased patient have excessive growth of hairs on pinna.
    - a) Hemophilia
    - b) Color blindness
    - c) Hypertrichosis
    - d) Night blindness
  - 3) *In Mirabilis jalapa*, formation of green, pale or white and variegated leaves on same plant is a cross between
    - a) Variegated × Variegated
    - b) Green × Variegated
    - c) Pale or White × Variegated
    - d) Green × Green
  - 4) Y linked genes are also called as
    - a) Autosomal
    - b) X-linked
    - c) Holandric genes
    - d) None of these
  - 5) Typical dihybrid ratio is modified as \_\_\_\_\_ in inhibitory gene actions.
    - a) 9 : 3 : 3 : 1
    - b) 9 : 7
    - c) 9 : 3 : 4
    - d) 13 : 3
  - 6) Dihybrid phenotypic ratio in the F<sub>2</sub> generation is
    - a) 9 : 3 : 3 : 1
    - b) 1 : 1 : 1 : 1
    - c) 9 : 3 : 4
    - d) 3 : 1
  - 7) In conjugation bacteria requires \_\_\_\_\_ for exchange of DNA.
    - a) Cilia
    - b) Sex pilus
    - c) Flagella
    - d) Competence factor

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- 8) A virulent phages are responsible for \_\_\_\_\_ type of life cycle in the host cell.
- a) Lysogenic    b) Lysolytic  
c) Lysolytic and Lysogenic                      d) None of the above
- 9) Sex pilus act as \_\_\_\_\_ tube during transfer of 'F' plasmids in bacterial cells.
- a) Transduction    b) Conjugation  
c) Transformation    d) Transcription
- 10) X chromosome of father is transferred to
- a) Son    b) Grandson  
c) Daughter    d) Both son and daughter
- 11) In incomplete dominance both alleles are \_\_\_\_\_ expressed.
- a) partially                      b) alternately                      c) equally                      d) simultaneously
- 12) Cytoplasmic genes are located on the \_\_\_\_\_ DNA.
- a) Chromosomal    b) Chloroplast  
c) Nuclear    d) X and Y chromosomal
- 13) The method of construction of maps of different chromosomes is called
- a) genetic mapping    b) linkage mapping  
c) cross over map    d) all of these
- 14) Garden pea as experimental material was selected by Mendel due to
- a) self-pollinating    b) annual plant  
c) produce viable seeds    d) all of these

2. Answer the following (**any 7**) :

**14**

- i) What is extranuclear inheritance ?
- ii) What is colour blindness ?
- iii) Sex determination in grasshoppers ?
- iv) What are F-plasmids ?
- v) What is test cross ?
- vi) What is hypotatic gene ?
- vii) What is incomplete linkage ?
- viii) What is virulent phages ?
- ix) Significance of crossing over.

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3. A) Answer the following (**any 2**) : **10**
- i) Describe multiple alleles with suitable example.
  - ii) Explain process of generalized transduction in bacteria.
  - iii) Describe process of mapping by tetrad analysis.
- B) Prove law of independent assortment with suitable example. **4**
4. Answer **any two** of the following : **14**
- i) Describe process of transformation with neat labeled diagram.
  - ii) Describe modifications of Mendelian ratios with any two suitable examples.
  - iii) Describe X and Y linked inheritance with any one suitable example.
5. Answer **any two** of the following : **14**
- i) Explain process of crossing over with neat labeled diagram.
  - ii) Describe extranuclear inheritance with any two suitable examples.
  - iii) Give structure of folded fibre model of bacterial DNA.
-



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**B.Sc. – II (Biotechnology) (Sem. – III) (New CBCS) Examination, 2017**  
**BASICS OF MOLECULAR BIOLOGY**

Day and Date : Saturday, 25-11-2017  
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

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

1. Choose and write a correct answer from given four alternatives : **14**
- 1) The 'S' strains of *Diplococcus pneumoniae* show glistening appearance due to the presence of polysaccharide
    - a) Polymer of Glucose and Glucouronic acid
    - b) Polymer of Fructose and Glucose
    - c) Polymer of Fructose and Glucouronic acid
    - d) Polymer of Fructose and sucrose
  - 2) The purines and pyrimidines in DNA was identified by
    - a) R. Altman
    - b) Emil Fischer
    - c) A. Kosseld
    - d) C. Todd
  - 3) The undigested part in the pus cells called the nuclein exhibit \_\_\_\_\_ property.
    - a) Neutral
    - b) Acidic
    - c) Basic
    - d) None of these
  - 4) Triplet code phenomenon was observed by F.H.C. Crick by using \_\_\_\_\_ dye.
    - a) Acridine
    - b) Feuelgen
    - c) Acetocarmine
    - d) Evans Blue
  - 5) The left handed double helix model with a Zig-Zag sugar phosphate back bone was proposed by
    - a) F.H.C. Crick
    - b) Rich
    - c) Watson J.D.
    - d) Khorana
  - 6) Genetic RNA present in plant virus TMV is \_\_\_\_\_ type.
    - a) Single stranded
    - b) Double stranded
    - c) Triple stranded
    - d) Four stranded

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- 7) The new leading strand synthesis runs from \_\_\_\_\_ direction.  
a) 3' to 5'      b) 5' to 3'      c) 3' to 3'      d) 5' to 5'
- 8) In photoreactivation the enzyme photolyase cleaves \_\_\_\_\_ dimers.  
a) G-G      b) C-C      c) T-T      d) A-A
- 9) \_\_\_\_\_ of Arginine and Lysine amino acids makes Histone proteins basic.  
a) 10% – 20%      b) 20% – 30%      c) 10% – 30%      d) 10% – 25%
- 10) Primer RNA provides the free \_\_\_\_\_ for polymerization during replication.  
a) 5' OH end      b) 3' OH end      c) 5' PO4 end      d) 3' PO4 end
- 11) Genes representing specialized function for specific tissue development are called  
a) XI<sup>st</sup> gene      b) Guide gene      c) Luxury gene      d) Slave gene
- 12) The smallest chloroplast genome is found in  
a) Red Algae      b) Pine      c) Tobacco      d) Tomato
- 13) The antibiotic ciprofloxacin inhibits \_\_\_\_\_ enzyme.  
a) Bacterial gyrase      b) Bacterial polymerase  
c) Bacterial ligase      d) Bacterial helicase
- 14) In SOS repair the two genes which inhibit cell division are  
a) Lex A and Rec A      b) Sul A and Sul B  
c) Mut S and Mut H      d) uvr B and uvr D

2. Answer **any seven** of the following :

14

- 1) Define Gene.
- 2) Define Chargaff's Rule.
- 3) Define Histone.
- 4) Define Linking Number.
- 5) Define DNA melting.
- 6) Define Mutagen.
- 7) Define Plaques.
- 8) Define Gene Deserts.
- 9) Define DNA Damage.

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3. A) Attempt **any two** of the following : **10**
- 1) Write about the salient features of double Helix of DNA with a neat labelled diagram.
  - 2) Describe Meselson and Stahl's Experiment of DNA replication with neat labelled diagram.
  - 3) Give an account of structural variations in DNA.
- B) Explain in detail about Cotcurve Analysis with neat labelled diagram. **4**
4. Attempt **any two** of the following : **14**
- 1) Describe in brief the organization of DNA in Eukaryotes with a neat labelled diagram.
  - 2) Explain the properties of Genetic Code with suitable examples.
  - 3) Describe in brief the Replication of DNA in Prokaryotes with a neat and labelled diagram.
5. Attempt **any two** of the following : **14**
- 1) Describe mismatch and Excision repair mechanism of DNA with a neat labelled diagram.
  - 2) Describe in detail DNA Replication process in Eukaryotes with a neat labelled diagram.
  - 3) Write in detail about D-loop model of Replication in Mitochondria with a neat labelled diagram
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**B.Sc. (Biotechnology) (Part – II) (Semester – III) (New – CBCS)  
Examination, 2017  
BIOPHYSICAL INSTRUMENTS**

Day and Date : Monday, 27-11-2017  
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

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

1. Rewrite the sentence using correct alternative given below : 14
- 1) In \_\_\_\_\_ technique, the cells are suspended in a stream of fluid and passed through electronic detection apparatus for detection.  
A) Nephelometry  
B) Flow cytometry  
C) NMR  
D) AAS
  - 2) A \_\_\_\_\_ meter can determine the intensity of scattered light at the right angles to the direction of incident light.  
A) pH  
B) dosi  
C) turbido  
D) nephlo
  - 3) In UV visible spectroscopy, the \_\_\_\_\_ filament lamp is generally used as a source for generation of visible radiations.  
A) Xenon  
B) Tungsten  
C) Deuterium  
D) Hydrogen
  - 4) In electromagnetic wave, the oscillations are \_\_\_\_\_ to the direction of propagation of wave and energy.  
A) Right angles  
B) Left angles  
C) Parallel  
D) Perpendicular
  - 5) Isopycnic centrifugation is a technique used to separate molecules on the basis of their \_\_\_\_\_.  
A) Surface tension  
B) Conductivity  
C) Redox potential  
D) Buoyant density
  - 6) Pulses of light generated due to ionization of a material by incident radiation are detected in \_\_\_\_\_.  
A) X-ray diffraction  
B) Flow cytometry  
C) GN counter  
D) Scintillation counter

P.T.O.



- 7) Phase contrast microscopy can show the differences in \_\_\_\_\_ as difference in contrast.
- A) Darkness B) Brightness  
C) Numerical aperture D) Refractive index
- 8) In \_\_\_\_\_ microscope, the light source and condenser are situated on the top above the stage, pointing downwards.
- A) Compound B) Inverted  
C) Dark field D) Phase contrast
- 9) In circular dichorism, the differential absorption of \_\_\_\_\_ light is analyzed.
- A) Polarized B) Reflected C) Inhibited D) Deviated
- 10) Density gradient of \_\_\_\_\_ is used for the density based separation of DNA molecules.
- A) Casium chloride B) Sucrose  
C) Glycerol D) Agarose
- 11) Beers law states that the amount of light absorbed by a material is directly proportional to the \_\_\_\_\_
- A) Intensity of light B) Conc. of the material  
C) Thickness of the material D) None of these
- 12) In electron microscopy the source of illumination is \_\_\_\_\_
- A) Light B) Tungsten filament  
C) Nichrome wire D) Black rod
- 13) The \_\_\_\_\_ rotors are designed to hold the sample containers at a constant angle relative to central axis.
- A) Fixed angle B) Vertical  
C) Angular D) Swinging bucket
- 14) The pH meter measures the potential difference between pH glass electrode and a \_\_\_\_\_ reference electrode.
- A) Zinc B) Cadmium C) Cobalt D) Calomel

2. Answer **any seven** of the following :

14

- 1) State different wavelength ranges of an electromagnetic spectrum.
- 2) How the NMR technique can be used for molecular characterization ?
- 3) Enlist types of radioactive decay.
- 4) What is rate zonal centrifugation ?

Set P



- 5) Write the principle of flow cytometry.
  - 6) Draw a neat labeled diagram of image formation in light microscopy.
  - 7) Give any two biological applications of radioisotopes.
  - 8) Give examples of indicators for pH measurement.
  - 9) Differentiate between dark field and bright field microscopy.
3. A) Answer **any two** of the following : **10**
- 1) Write an account on GM counter.
  - 2) Write a note on nature of radioactivity.
  - 3) Describe the ultracentrifugation technique.
- B) Write about molecular energy levels of an electromagnetic spectrum. **4**
4. Answer **any two** of the following : **14**
- 1) Describe X-ray diffraction as a molecular characterization technique.
  - 2) Describe hazardous effects of radioactivity. Add a note on safety measures for handling of radioisotopes.
  - 3) Write an account on pH meter. Describe the errors in pH measurement.
5. Answer **any two** of the following : **14**
- 1) Write optical principle of microscopy. Describe different types of microscopic techniques.
  - 2) Describe construction, working and applications of UV-Visible spectroscopy.
  - 3) Describe CD-ORD as a molecular characterization technique.
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**B.Sc. II Biotechnology (Semester – III) Examination, 2017**  
**ANIMAL TISSUE CULTURE (New CBCS)**

Day and Date : Tuesday, 28-11-2017  
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

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

1. Rewrite the following sentences by choosing correct alternatives. 14

- 1) \_\_\_\_\_ serum may also be less likely to metabolize polyamines due to lower level of polyamine oxidase.  
a) Camel                      b) Bovine                      c) Horse                      d) Goat
- 2) Cell culture substrate is also treated with special types of cells called  
a) palladium                      b) Agarose                      c) Feeder layer                      d) Teflon
- 3) \_\_\_\_\_ used Penicillin and streptomycin as antibiotic in culture media.  
a) Carrel    b) Rous and Jones  
c) Butler    d) Freshney
- 4) Factor IX is a glycoprotein secreted in vivo by \_\_\_\_\_ cell.  
a) Kuffer    b) Hepatocytes  
c) Epidermal    d) Endothelial
- 5) Along with nutritional and hormonal factors \_\_\_\_\_ factor is also essential for survival of cell in culture.  
a) Insulin                      b) Lipids                      c) Proteins                      d) Stromal
- 6) \_\_\_\_\_ technique is well known in forensic science but is gradually adopted as a standard reference technique for cell line identity in culture collection.  
a) DNA fingerprinting    b) Karyotyping  
c) LDH assay    d) Lowry assay

P.T.O.





- 7) Disaggregation method is used for
- a) Isolation of specific tissue
  - b) Isolation of specific cell from tissue
  - c) Isolation of specific organ
  - d) Isolation of specific tissue debris
- 8) HEPA filter is nothing but
- a) High efficiency partial air filter
  - b) Heavy effective pressure air filter
  - c) Heavy effective particular air filter
  - d) High efficiency particulate air supply filter
- 9) Damaged membrane of non viable cells produces \_\_\_\_\_ in culture medium.
- a) LDH
  - b) Monoclonal antibody
  - c) Lipid
  - d) NADH
- 10) Encapsulation of DNA in \_\_\_\_\_ is effective way to improve the efficiency of cellular uptake.
- a) Glucose vesicles
  - b) Liposome vesicles
  - c) Protein vesicles
  - d) Calcium vesicles
- 11) The kidney is the source of synthesis of
- a) Erythropoietin
  - b) Antibodies
  - c) Insulin
  - d) Complement
- 12) \_\_\_\_\_ is synthesized by Viral infected cells.
- a) Actin protein
  - b) Antibodies
  - c) Interferon
  - d) Glucose
- 13) \_\_\_\_\_ pH indicator is used in ATC media.
- a) Crystal violet
  - b) Phenol Red
  - c) Aceto-carmin
  - d) Trypan blue
- 14) In Raft culture \_\_\_\_\_ sheet is allowed to float on the serum.
- a) Zinc acetate
  - b) Sodium chloride
  - c) Lead acetate
  - d) Rayon acetate



2. Answer the following (**any seven**) : **14**
- 1) Enlist the characteristics of animal cells in culture.
  - 2) Explain in brief criteria for subculture.
  - 3) Give brief account on purpose of use of monoclonal antibodies.
  - 4) Explain importance of incubation in ATC.
  - 5) Write a note on cell separation.
  - 6) Explain role of pH indicator in media.
  - 7) Give brief account on complete media.
  - 8) Write a note on mechanical disaggregation.
  - 9) Write a note on cell determination by glucose
3. A) Answer the following (**any two**) : **10**
- 1) Describe in detail serum free media.
  - 2) Explain the role of collagenase in tissue disaggregation.
  - 3) Give details of chemical and physical methods of cell synchronization.
- B) Write a note on history of ATC. **4**
4. Answer the following (**any two**) : **14**
- 1) Explain identification of cells by Isozymes pattern and DNA Fingerprinting.
  - 2) Describe instruments used in ATC.
  - 3) Explain production of blood clotting factors.
5. Answer the following (**any two**) : **14**
- 1) Discuss in detail cell counting and monitoring.
  - 2) Explain different methods of organ culture.
  - 3) Add a note on transfer of naked DNA.
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**B.Sc. – II (Biotechnology) (Semester – III) (CBCS) (New)  
Examination, 2017  
BIOENERGETICS AND ENZYMOLOGY**

Day and Date : Wednesday, 29-11-2017  
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

- Instructions :** 1) **All** questions carry **equal** marks.  
2) Figures to **right** indicate **full** marks.  
3) Draw **neat** and **labeled** diagrams.

1. Rewrite the following sentences by using correct alternative. 14

- 1) Enzymes are \_\_\_\_\_ in nature.  
a) acidic                      b) protein                      c) basic                      d) neutral
- 2) In an irreversible process \_\_\_\_\_ occurs.  
a) Entropy must increase                      b) Entropy must decrease  
c) Enthalpy must increase                      d) Enthalpy must decrease
- 3) \_\_\_\_\_ bond is hydrolyzed when ATP is converted to Adenosine Diphosphate (ADP).  
a) Glycosidic                      b) Peptide                      c) Ester                      d) Pyrophosphate
- 4) \_\_\_\_\_ are antibodies with catalytic activity.  
a) Holoenzyme                      b) Abzymes                      c) Ribozymes                      d) Coenzymes
- 5) \_\_\_\_\_ isozyme form of lactate dehydrogenase increases myocardial infarction.  
a) LDH 1 and LDH 2                      b) LDH 2 and LDH 3  
c) LDH 3 and LDH 4                      d) LDH 4 and LDH 5
- 6) Allosteric enzymes function through reversible, noncovalent binding of a regulatory metabolite called a  
a) Activator                      b) Inhibitor                      c) Modulator                      d) Co-factor
- 7) The symmetry model the Kinetic behavior of allosteric enzyme was proposed by  
a) Koshland                      b) Arora                      c) Parlor                      d) Jacques Monod

P.T.O.



- 8) Cofactors are non-protein atoms or molecules which bind to the  
a) Apoenzyme    b) Holoenzyme    c) Coenzyme    d) Modulator
- 9) \_\_\_\_\_ is the Michaelis constant for the enzyme binding substrate.  
a)  $V_{max}$                       b)  $k_m$                       c) S                      d) h
- 10) \_\_\_\_\_ biochemical reactions, the position of a functional group is changed within a molecule, but the molecule itself contains the same number and kind of atom.  
a) Phosphorylation                      b) Ligation  
c) Isomerization                      d) Oxidation
- 11) In competitive type of inhibition  
a)  $K_m$  increases,  $V_{max}$  is unchanged  
b)  $K_m$  decrease,  $V_{max}$  is unchanged  
c)  $K_m$  increases,  $V_{max}$  decreases  
d)  $K_m$  and  $V_{max}$  increase
- 12) The enzymes that catalyze these oxidations are called  
a) Phosphorylase    b) Reductase    c) Hydrolase    d) Dehydrogenases
- 13) The change in \_\_\_\_\_ is an indicator of the direction of spontaneous reaction for systems at constant pressure and temperature.  
a) The Gibbs Free Energy                      b) Enthalpy  
c) Entropy                      d) Velocity
- 14) The reactant upon which an enzyme acts is known as  
a) Substrate    b) Metabolite    c) Product    d) Catalyst

2. Answer the following (**any 7**) :

14

- i) Draw structure of ATP.
- ii) What are ribozymes ?
- iii) Define thermodynamics.
- iv) What is co-enzyme and give its one example ?
- v) Write down the Lineweaver Burk equation with graphical plot.
- vi) Define activator and give its one example.
- vii) Write a note on group transfer reaction.
- viii) Write about biological standard state.
- ix) Write about mass action ratio of reaction.

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3. A) Answer the following (**any 2**) : **10**
- i) Write a brief account on first and second law of thermodynamics.
  - ii) Explain in detail biological role of enzymes.
  - iii) Give the role of ATP as universal currency of free energy in biological system.
- B) Write a note on isoenzyme form of LDH with their clinical significance. **4**
4. Answer **any two** of the following : **14**
- i) Write a note on enzyme regulation in living system.
  - ii) Derive Michaelis-Menten equation for single substrate and give significance of  $K_m$  and  $V_{max}$ .
  - iii) What is free energy change ? Add a note on standard free energy change.
5. Answer **any two** of the following : **14**
- i) Explain in detail effect of inhibitors and activators on enzyme activity.
  - ii) Give detailed classification of enzymes with examples of each class.
  - iii) Describe lock and key mechanism and induced fit hypothesis for enzyme activity.
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**B.Sc. – II (Semester – III) (Biotechnology) (New – CBCS) Examination, 2017  
FUNDAMENTALS OF IMMUNOLOGY**

Day and Date : Thursday, 30-11-2017  
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

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

1. Choose the correct alternative and rewrite the sentences again. **14**
- i) Main function of Hematopoietin (Hematopoietic Growth Factor) is \_\_\_\_\_ production.
    - a) Platelet
    - b) Erythrocyte
    - c) Mast cell
    - d) Neutrophil
  - ii) Macrophage-like cells present in liver are called as
    - a) Langerhan
    - b) Kuffer
    - c) Microglial
    - d) Alveolar
  - iii) Blood born antigens are recognized in
    - a) spleen
    - b) bone marrow
    - c) lymph node
    - d) thymus
  - iv) Horny outer layer of the skin called stratum corneum is made up of
    - a) sebum
    - b) fatty acid
    - c) cartilage
    - d) keratin
  - v) Lactoperoxidase in \_\_\_\_\_ possess antibacterial property.
    - a) gastric juice
    - b) mucosa
    - c) milk
    - d) urine
  - vi) Antigen showing immunogenicity and immunological reactivity are
    - a) Incomplete antigens
    - b) Complete antigens
    - c) Haptens
    - d) Adjuvants
  - vii) Protein antigens are \_\_\_\_\_ antigenic than polysaccharide antigens.
    - a) less
    - b) medium
    - c) equal
    - d) more



- viii) IL-4 induces class switching to  
a) IgG                      b) IgA                      c) IgE                      d) IgD
- ix) Two or more cytokines that mediate similar functions are called  
a) redundant                      b) synergetic  
c) cascade                      d) pleiotropic
- x) \_\_\_\_\_ shows monomeric type of antibody structure.  
a) IgD                      b) IgA                      c) IgG                      d) all of these
- xi) \_\_\_\_\_ antibody can pass the placenta.  
a) IgA                      b) IgD                      c) IgG                      d) IgM
- xii) Wassermann test for diagnosis of syphilis is example of \_\_\_\_\_ test.  
a) Complement fixation                      b) RIA  
c) Kahn                      d) VDRL
- xiii) VDRL test is example of \_\_\_\_\_ test.  
a) ring precipitation                      b) slide flocculation  
c) tube precipitation                      d) slide agglutination
- xiv) End products of enzyme-substrate reaction are analyzed in \_\_\_\_\_ test.  
a) Radioimmunoassay                      b) Immunofluorescence  
c) ELISA                      d) Precipitation

2. Define and explain **any seven** of the following :

14

- i) Opsonization
- ii) Hematopoiesis
- iii) Secondary lymphoid organs
- iv) Cascade mechanism
- v) Immunogenicity
- vi) Fab
- vii) Immunological cross-reactivity
- viii) Affinity
- ix) Titre.

Set P



3. A) Answer **any two** of the following : **10**
- i) What is cytokines ? Explain the properties of Cytokines.
  - ii) Explain the factors involved in hematopoiesis.
  - iii) Explain the properties and functions of dendritic cells.
- B) Explain in brief structure and functions of Class II MHC. **4**
4. Answer **any two** of the following : **14**
- i) What is Antigen ? Explain the factors affecting antigenicity of antigen.
  - ii) Explain the structure, properties and functions of IgG.
  - iii) Explain in detail ELISA techniques and its applications in diagnosis.
5. Answer **any two** of the following : **14**
- i) Explain the structure and functions of Lymph node.
  - ii) Explain various agglutination tests with examples.
  - iii) Explain the structure, properties and functions of IgA.
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**B.Sc. – II (Biotechnology) (Semester – III) (CGPA) Examination, 2017**  
**INHERITANCE BIOLOGY (Old)**

Day and Date : Friday, 24-11-2017  
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

- Instructions :** 1) *All questions carry equal marks.*  
2) *Figures to right indicate full marks.*  
3) *Draw neat and labeled diagrams.*

1. Rewrite the following sentences by using correct alternative.

14

- 1) \_\_\_\_\_ females are heterogametic.
  - a) Human
  - b) Honey bee
  - c) Birds
  - d) Grasshopper
- 2) In \_\_\_\_\_ the typical Mendelian dihybrid ratio is changed to 9 : 7.
  - a) Complementary gene action
  - b) Supplementary gene action
  - c) Inhibitory gene action
  - d) None of these
- 3) B. Ephrussi was first discovered \_\_\_\_\_ in the yeast.
  - a) Auxotrophic mutants
  - b) Petite mutants
  - c) *Lac* mutants
  - d) *ara* mutants
- 4) Excess growth of hairs on pinna of ear is called as \_\_\_\_\_.
  - a) Hemophilia
  - b) Colorblindness
  - c) Hypertrichosis
  - d) Night blindness
- 5) Transformation naturally found in \_\_\_\_\_.
  - a) *B. subtilis*
  - b) *H. influenzae*
  - c) *D. pneumoniae*
  - d) All of these
- 6) In the conjugation process \_\_\_\_\_ is actively involved.
  - a) 'Ti' plasmids
  - b) 'F' plasmids
  - c) pBR322
  - d) pUC18
- 7) \_\_\_\_\_ discovered the process of transformation in bacteria.
  - a) A. Hershey and M. Chase
  - b) J. Lederberg and E. Tatum
  - c) J. Lederberg and N. Zinder
  - d) Avery, MacLeod and McCarthy



- 8) Plasma or extranuclear genes are located in \_\_\_\_\_  
a) lysosomes and chloroplast    b) lysosomes and plasmids  
c) ribosomes and chloroplast    d) mitochondria and chloroplast
- 9) The method of construction of maps of different chromosomes is called \_\_\_\_\_  
a) Genetic mapping                      b) Linkage mapping  
c) Cross over map                        d) All of these
- 10) Typical dihybrid test cross ratio is \_\_\_\_\_  
a) 9 : 3 : 3 : 1                            b) 1 : 1 : 1 : 1  
c) 9 : 3 : 4                                 d) 1 : 2 : 1
- 11) \_\_\_\_\_ is not a dominant trait.  
a) Round seeds                            b) Purple flowers  
c) Yellow pods                             d) Inflated pods
- 12) In grasshoppers \_\_\_\_\_ sex determination system was studied by McClung.  
a) XX-XY                      b) XX-XO                      c) ZZ-ZW                      d) Haplo-diploid
- 13) In \_\_\_\_\_ the heterozygote is intermediate in phenotype between the two homozygotes.  
a) Dominance                            b) Multiple alleles  
c) Incomplete dominance                d) Complementation
- 14) In 1909, Carl Correns studied the inheritance of leaf variegation in the \_\_\_\_\_  
a) *Pisum sativum*                        b) *Zea mays*  
c) *Arabidopsis thaliana*                d) *Mirabilis jalapa*

2. Answer the following (**any 7**) :

14

- i) What is epistasis and hypostasis ?
- ii) Write significance of linkage.
- iii) Define Pseudo-alleles.
- iv) Write on sex chromosomes in humans.
- v) Define competence factor.
- vi) Write a note on petite mutants in yeast.
- vii) What is complementation test ?
- viii) Write a note on bleeder disease.
- ix) Write a note on inhibitory genes.



3. A) Answer the following (**any 2**) : **10**
- i) Explain Y linked inheritance with any two suitable examples.
  - ii) Describe genetic system in chloroplast.
  - iii) Describe maternal inheritance with any two suitable examples.
- B) Describe law of independent assortment with suitable example. **4**
4. Answer **any two** of the following : **14**
- i) Write in detail process of transformation in bacteria.
  - ii) Explain process of crossing over with neat labeled diagram.
  - iii) Explain supplementary and complementary gene action with suitable example.
5. Answer **any two** of the following : **14**
- i) Explain X linked inheritance with any two suitable examples.
  - ii) Explain in detail process of conjugation with neat labeled diagram.
  - iii) Describe gene mapping by tetrad analysis.
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**B.Sc. – II (Biotechnology) (Semester – III) (CGPA) Examination, 2017  
CYTO-GENETICS AND POPULATION GENETICS (Old)**

Day and Date : Saturday, 25-11-2017

Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

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

1. Choose and write a correct answer from given four alternatives : **14**

- 1) Sister chromatids are held together at their centromeres by a protein is called \_\_\_\_\_  
a) Securin                      b) Auxin                      c) Cytokinin                      d) Cohesin
- 2) Low ratio of RNA and DNA result in \_\_\_\_\_  
a) Mitosis    b) Meiosis  
c) Both a) and b)    d) None of these
- 3) Mutation arise due to \_\_\_\_\_  
a) Infection by microorganism  
b) Abrupt change in the gene  
c) Dominant character of one of the parent  
d) Nutritional factor
- 4) Number of Barr bodies present in the nucleus of the Male XY chromosome is \_\_\_\_\_  
a) 2                                      b) 1                                      c) 3                                      d) 0
- 5) The sex linked mutation is investigated by \_\_\_\_\_  
a) AME's test  
b) Replica plate technique  
c) CLB technique  
d) Attached X chromosome technique
- 6) The X Chromosome is placed in \_\_\_\_\_ of the Human Karyotype Analysis.  
a) Group B                      b) Group E                      c) Group C                      d) Group D

P.T.O.



- 7) Trisomy of chromosome 21 results in \_\_\_\_\_  
a) Down's syndrome    b) Edward's syndrome  
c) Patau's syndrome    d) Klienfelter's syndrome
- 8) Nondisjunction produces cells or gametes with extra or missing chromosome which is called as \_\_\_\_\_  
a) Euploidy                      b) Aneuploidy                      c) Polyploidy                      d) Monoploidy
- 9) Seedless watermelon is the result of \_\_\_\_\_  
a) Triploid    b) Tetraploid  
c) Autopolyploid    d) Allopolyploid
- 10) Transposition event involves \_\_\_\_\_ process.  
a) Recombination  
b) Transposition  
c) Replication  
d) Both Recombination and Replication
- 11) The proportion of different alleles of a gene present in a Mendelian population is \_\_\_\_\_  
a) Gene pool    b) Gene frequency  
c) Gametic pool    d) Genotype frequency
- 12) SINES stands for \_\_\_\_\_  
a) Short Interspersed Nuclear Sequence  
b) Small Interspersed Nuclear Sequence  
c) Small Interrelated Nuclear Sequence  
d) Short Interrelated Nuclear Sequence
- 13) In human being the eye colour is been suggested by \_\_\_\_\_  
a) X-Linked                      b) Y- Linked                      c) XY Linked                      d) All of these
- 14) All the individuals of a species constitute a \_\_\_\_\_  
a) Population                      b) Society                      c) Community                      d) Family

2. Solve **any seven** of the following :

14

- 1) What is a Solenoid ?
- 2) Define Euchromatin.
- 3) Define Transition mutation.

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- 4) Define Telocentric chromosome.
  - 5) Define Slave genes.
  - 6) Define Inbreeding.
  - 7) Define Range.
  - 8) Define Autopolyploids.
  - 9) Define Kinetochore.
3. A) Attempt **any two** of the following : **10**
- 1) Describe the structure of lampbrush chromosome with a neat labelled diagram.
  - 2) What is a Mutagen ? Write about the chemical Mutagenic agents.
  - 3) What is Heterochromatin ? Write about Marylyon's hypothesis.
- B) With a neat labelled diagram write in detail about the process of meiosis. **4**
4. Attempt **any two** of the following : **14**
- 1) Write in detail about replicative and non-replicative transposition.
  - 2) Write in detail about the causes and detection of mutation.
  - 3) Write in detail about the structural changes in chromosome.
5. Attempt **any two** of the following : **14**
- 1) Write in detail Hardy Weinberg law and its application.
  - 2) Describe multiple factor hypothesis with suitable examples.
  - 3) Write a note on effect of environment on quantitative traits.
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**B.Sc. Biotechnology (Part – II) (Semester – III) (Old) Examination, 2017  
BIOPHYSICAL INSTRUMENTS (CGPA)**

Day and Date : Monday, 27-11-2017

Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

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

1. Rewrite the sentence using correct alternative given below : 14

- 1)  $\gamma$  radiations have \_\_\_\_\_ nature.  
a) Particle                      b) Wave                      c) Visible light                      d) Infrared light
- 2) In circular dichroism, the differential absorption of \_\_\_\_\_ light is analyzed.  
a) polarized                      b) reflected                      c) inhibited                      d) deviated
- 3) In electron microscopy the source of illumination is \_\_\_\_\_  
a) Light                                      b) Tungsten filament  
c) Nichrome wire                      d) Black Rod
- 4) Radioactivity labeled and unlabeled antigens are used in \_\_\_\_\_  
a) Flow cytometer                      b) AAS  
c) UV Spectrometer                      d) RIA
- 5) Variations in the optical rotation of a substance with changing light wavelength are analyzed in \_\_\_\_\_  
a) XRD                                      b) FACS                                      c) GM counting                      d) CD-ORD
- 6) The working range of a pH meter is in between \_\_\_\_\_  
a) 8 – 14                                      b) 0 – 14                                      c) 0 – 7                                      d) 1 – 7
- 7) The range of visible radiation is \_\_\_\_\_ nm.  
a) 200 – 400                                      b) 380 – 780                                      c) 800 – 1000                                      d) none of these
- 8) Beers law states that the amount of light absorbed by a material is directly proportional to the \_\_\_\_\_  
a) Intensity of light                                      b) Conc. of the material  
c) Thickness of the material                                      d) None of these

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- 9) The unit of centrifugation is \_\_\_\_\_
  - a) Svedberg
  - b) Sedimentation coefficient
  - c) Gravity
  - d) All of the above
- 10) The first working microscope was designed by \_\_\_\_\_
  - a) Robert Hook
  - b) Kepler
  - c) Leeuwenhoek
  - d) Watson
- 11) Radioactive decay is measured in a \_\_\_\_\_
  - a) Scintillation counter
  - b) AAS
  - c) UV Spectrometer
  - d) Autoradiography
- 12) The – log of H<sup>+</sup> ions is \_\_\_\_\_
  - a) Buffer
  - b) Basic
  - c) Acidic
  - d) pH
- 13) To measure concentration of \_\_\_\_\_ UV radiation is used.
  - a) Protein
  - b) Lipid
  - c) Carbohydrate
  - d) All of the above
- 14) X-Diffraction can only be applied to \_\_\_\_\_
  - a) Solid crystalline materials
  - b) Gaseous or vapour materials
  - c) Liquids
  - d) All of the above

2. Answer **any seven** of the following :

14

- 1) What is radioactivity ?
- 2) Explain the principle of fluorescence.
- 3) State the principle of X-ray diffraction.
- 4) Define relative centrifugal force.
- 5) Write four applications of colorimetry.
- 6) Describe Rate Zonal Centrifugation.
- 7) Write the principle of scintillation counter.
- 8) Write applications of flow cytometry.
- 9) Comment on image formation in a light microscope.



3. A) Write the short answers to (**any two**) : **10**
- 1) Explain in briefly the working of Atomic Absorption Spectroscopy.
  - 2) State the principle of transmission electron microscopy and give its applications.
  - 3) What is the use of a glass electrode in a pH meter ?
- B) Write the principle and applications of Optical Rotatory Dispersion. **4**
4. Write short notes on **any two** of the following : **14**
- 1) Write the principle and working of a Geiger Muller counter.
  - 2) Illustrate the electron microscopy techniques.
  - 3) Explain the Electromagnetic Spectrum.
5. Attempt **any two** of the following : **14**
- 1) Describe the different types of centrifugation.
  - 2) Describe the construction, working and applications of UV visible spectroscopy.
  - 3) Write the principle, working and applications of NMR.
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**B.Sc. – II (Semester – III) (Old) Examination, 2017**  
**BIOTECHNOLOGY**  
**Analytical Techniques (CGPA)**

Day and Date : Tuesday, 28-11-2017  
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

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

1. Rewrite the following sentences by choosing correct alternatives : 14

- 1) Electrophoresis in \_\_\_\_\_ gel is referred as PAGE.  
a) Agar                      b) Agarose                      c) Starch                      d) Acrylamide
- 2) Paper used for paper electrophoresis consists of \_\_\_\_\_ of cellulose.  
a) 50%                      b) 85%                      c) 95%                      d) 75%
- 3) Migration rate under unit potential gradient is called as \_\_\_\_\_ of ions.  
a) Viscosity                      b) Mobility                      c) Absorptivity                      d) Resistivity
- 4) \_\_\_\_\_ is the process of precipitation of proteins in solution by the addition of large amount of inorganic salt.  
a) Salting out                      b) SDS-PAGE                      c) IEF                      d) Salting in
- 5) \_\_\_\_\_ is a faster purification technique than dialysis.  
a) Cell disruption                      b) Centrifugation  
c) Immobilization                      d) Ultrafiltration
- 6) \_\_\_\_\_ is the physical method of cell disruption.  
a) Lysozyme                      b) Detergents  
c) Osmotic shock                      d) Alkali
- 7) Volume of \_\_\_\_\_ per unit time is known as flow rate.  
a) Stationary phase                      b) Mobile phase  
c) Slurry                      d) Sample

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- 8) Usually in paper chromatography stationary phase is \_\_\_\_\_  
a) Water                      b) Base                      c) Acid                      d) Alcohol
- 9) Chromatography is \_\_\_\_\_ method for separation of compounds.  
a) Biological              b) Chemical              c) Mechanical              d) Physical
- 10) \_\_\_\_\_ is extensively used chromatographic technique to determine base composition of nucleic acid.  
a) GLC                      b) Adsorption              c) Ion exchange              d) Affinity
- 11) \_\_\_\_\_ gives information needed for the synthesis of oligonucleotide.  
a) Macrosequencing                      b) Microsequencing  
c) Blotting                      d) Blocking
- 12) \_\_\_\_\_ creates ions by holding a liquid at high potential difference.  
a) ESI                      b) API                      c) APPI                      d) APCI
- 13) BCA stands for  
a) Bromide Carrier Assay                      b) Bergmans Centrifugation Assay  
c) Baltimores Citrates Assay                      d) Bicinchoninic Acid Assay
- 14) \_\_\_\_\_ involves quantitative study of global changes in protein expression in cell or tissue.  
a) Protein Microarray                      b) Protein Precipitation  
c) Protein Expression Mapping                      d) Protein Interaction Mapping

2. Answer the following (**any seven**) :

14

- 1) Write a note on electrophoresis.
- 2) Define isoelectric point.
- 3) Nature of paper in paper chromatography.
- 4) Cell disruption by organic solvents.
- 5) Write a note on functional genomics.
- 6) Write the principle of Bradford assay.
- 7) Define Proteome and proteomics.
- 8) Column used in column chromatography.
- 9) Write a note on chromatography.



3. A) Answer the following **(any two)** : **10**
- 1) Write a note on polyacrylamide as support media.
  - 2) Explain sample taking in 2-D gel electrophoresis.
  - 3) Describe assay used for iodine value.
- B) Explain basic principle of electrophoresis. **4**
4. Answer the following **(any two)** : **14**
- 1) Describe electrophoretic technique for protein w.r.t. discontinues gel.
  - 2) Discuss mass spectrometers for proteomics study.
  - 3) Give details of Lowry assay for protein estimation.
5. Answer the following **(any two)** : **14**
- 1) Discuss DNA blotting technique.
  - 2) Describe chromatographic technique which uses biological interaction between biomolecules for their separation.
  - 3) Explanation mechanical methods used for cell disruption.
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**B.Sc. – II (Semester – III) (Biotechnology) (Old-CGPA) Examination, 2017  
IMMUNOLOGY – I**

Day and Date : Wednesday, 29-11-2017  
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

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

1. Choose the correct alternative and rewrite the sentences again : **14**
- i) Spermine and \_\_\_\_\_ present in the semen carry out antibacterial activity.
    - a) cobalt
    - b) copper
    - c) zinc
    - d) nickel
  - ii) In primary immune response \_\_\_\_\_ antibody is predominant.
    - a) IgG
    - b) IgM
    - c) IgE
    - d) IgD
  - iii) Resistance against tuberculosis and leprosy is carried through \_\_\_\_\_ immune response.
    - a) Cell mediated
    - b) Humoral
    - c) Primary
    - d) Secondary
  - iv) Serotonin, primary mediator of anaphylaxis is formed by degradation of \_\_\_\_\_.
    - a) alanine
    - b) histidine
    - c) tryptophan
    - d) lysine
  - v) Rheumatoid arthritis is example of \_\_\_\_\_ disease.
    - a) Hemolytic autoimmune
    - b) Organ specific autoimmune
    - c) Non-organ specific autoimmune
    - d) Infectious
  - vi) To evade from immune response \_\_\_\_\_ hide or lose their antigens.
    - a) bacteria
    - b) viruses
    - c) fungi
    - d) helminthes

P.T.O.



- vii) When titre of iso-antibodies present in 'O' Blood group is more than \_\_\_\_\_ is said 'Danger O Group' or Danger Donor.
- a) 1:15                                      b) 1:50  
c) 1:150                                      d) 1:200
- viii) \_\_\_\_\_ is the live attenuated vaccine.
- a) BCG    b) TAB  
c) TT     d) DT
- ix) \_\_\_\_\_ cells are not used for monoclonal antibody production using hybridoma technique.
- a) B clone    b) B lymphocyte  
c) Myeloma                                         d) Plasma
- x) In CMI, \_\_\_\_\_ will perform role in target cell killing.
- a) Perforins  
b) Granzymes  
c) Fragmentins  
d) All of these
- xi) Lactoperoxidase in \_\_\_\_\_ possess antibacterial property.
- a) milk     b) mucosa  
c) gastric juice                                      d) urine
- xii) Mature antibody-secreting cells are called \_\_\_\_\_
- a) T cells    b) immunoblasts  
c) Neutrophils                                        d) plasma cells
- xiii) \_\_\_\_\_ is the example of Hemolytic autoimmune disease.
- a) Thrombocytopenia  
b) Hashimoto's disease  
c) Addison's disease  
d) Myasthenia Gravis
- xiv) In the A blood group person \_\_\_\_\_ iso-antibodies are present.
- a) anti-B    b) anti-A  
c) anti-D    d) anti-O



2. Define and explain **any seven** of the following : **14**
- i) Phagocytosis
  - ii) Secondary immunity
  - iii) Evasion
  - iv) T cell dependent antigen
  - v) Autoantigen
  - vi) Native immunity
  - vii) Autoimmunity
  - viii) Hybridoma.
3. A) Answer **any two** of the following : **10**
- i) Explain first line of defense.
  - ii) Explain antibody production against T cell independent antigen.
  - iii) Explain in detail cell mediated immunity.
- B) Explain type I hypersensitivity with example. **4**
4. Answer **any two** of the following : **14**
- i) Explain organ specific autoimmune diseases with examples.
  - ii) Write an essay on immunity to viruses.
  - iii) Write an essay on ABO and Rh blood group system.
5. Answer **any two** of the following : **14**
- i) Explain blood group determination, cross-matching, direct and indirect Coomb's test.
  - ii) Explain traditional vaccines with examples.
  - iii) Write an essay on monoclonal antibody production and its applications.
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**B.Sc. II (Semester – III) (Biotechnology) (Old CGPA) Examination, 2017  
IMMUNOLOGY – II**

Day and Date : Thursday, 30-11-2017  
Time : 2.30 p.m. to 5.00 p.m.

Max Marks : 70

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

1. Choose the correct alternative and rewrite the sentences again : 14
- i) Primary immune response is characterised by the production of \_\_\_\_\_ type of antibodies.  
a) IgG                      b) IgM                      c) IgD                      d) IgE
  - ii) \_\_\_\_\_ antibody is known as “reagin antibody” as it is significant in allergic responses.  
a) IgM                      b) IgD                      c) IgE                      d) IgA
  - iii) Eyelens protein is example of \_\_\_\_\_ antigen.  
a) Auto                      b) Heterophile                      c) Microbial                      d) None of these
  - iv) In alternate pathway binding of \_\_\_\_\_ stabilizes the  $C_3bBb$ .  
a) Properdin                      b) Lectin                      c) Cl                      d) Serine protease
  - v) Viral antigens are processed and presented by \_\_\_\_\_ pathway.  
a) Cytosolic                      b) Endocytic                      c) Complement                      d) None of these
  - vi) Widal test is example of  
a) Agglutination                      b) Precipitation  
c) Complement fixation                      d) Neutralization
  - vii) \_\_\_\_\_ is a primary lymphoid organ.  
a) Spleen                      b) Lymphnode                      c) Peyer’s patch                      d) Thymus
  - viii) \_\_\_\_\_ plays an important role in mounting immune response to antigens in the blood stream.  
a) Lymphnode                      b) Bone marrow                      c) Thymus                      d) Spleen
  - ix) \_\_\_\_\_ antibodies are involved in complement mediated cell lysis.  
a) IgA, IgD                      b) IgG, IgM                      c) IgA, IgE                      d) None of these
  - x) Virus multiplication in animal cell is prevented by  
a) Lysozyme                      b) Colicin                      c) Interferon                      d) Antigen

P.T.O.



- xi) The major function of class II MHC is presentation of peptide-antigen to \_\_\_\_\_ cells.  
a) T<sub>H</sub>                      b) T<sub>C</sub>                      c) B                      d) T<sub>S</sub>
- xii) IL-4 induce class switching to  
a) IgG                      b) IgE                      c) IgA                      d) IgD
- xiii) Fluorescein isothiocyanate or phycoerythrin are used in  
a) Immuno-fluorescence                      b) ELISA  
c) Complement fixation                      d) Radioimmunoassay
- xiv) Phenomenon of phagocytosis is first discovered by  
a) Louis Pasteur                      b) Elie Metchnikoff  
c) Edward Jenner                      d) Robert Koch

2. Answer **any seven** of the following : **14**
- i) Define agglutination and precipitation.
  - ii) Define apoptosis and necrosis.
  - iii) Give any four features of antigen-antibody interaction.
  - iv) Enlist primary and secondary lymphoid organs.
  - v) Give properties of cytokines.
  - vi) Give any four types of antigen with its example.
  - vii) Functions of cytokines.
  - viii) Give functions of complement system.
3. A) Answer **any two** of the following : **10**
- i) Write an account on processing and presentation of endogenous antigen.
  - ii) Write an account on process of hematopoiesis.
  - iii) Write an account on cells of immune system.
- B) Give structure and function of antibody. **4**
4. Answer **any two** of the following : **14**
- i) Write an account on structure and function of MHC class I molecule.
  - ii) Write note on Immunofluorescence and Radioimmunoassay.
  - iii) Give an account on classical complement pathway.
5. Answer **any two** of the following : **14**
- i) Secondary lymphoid organs-structure and function.
  - ii) Describe ELISA and its three types.
  - iii) Give an account on processing and presentation of exogenous antigen.



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**B.Sc. – II (Biotechnology) (Semester – IV) (CGPA) Examination, 2017  
MOLECULAR BIOLOGY – I**

Day and Date : Saturday, 2-12-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. Choose and write a correct answer from given four alternatives : **14**
- 1) The “S” strains of *Diplococcus pneumoniae* show glistering appearance due to the presence of polysaccharide
    - a) Polymer of Glucose and Glucouronic acid
    - b) Polymer of Fructose and Glucose
    - c) Polymer of Fructose and Glucouronic acid
    - d) Polymer of Fructose and Sucrose
  - 2) The largest Fascinating molecule found in living system is
    - a) Proteins
    - b) Fatty acid
    - c) Nucleic acid
    - d) Vitamin
  - 3) The undigested part in the pus cells called the nuclein exhibit \_\_\_\_\_ property.
    - a) Neutral
    - b) Acidic
    - c) Basic
    - d) None of these
  - 4) Triplet code phenomenon was observed by F.H.C. Crick by using \_\_\_\_\_ dye.
    - a) Acridine
    - b) Feuelgen
    - c) Acetocarmine
    - d) Evans Blue
  - 5) The left handed double helix model with a Zig-Zag sugar phosphate back bone was proposed by
    - a) F.H.C. Crick
    - b) Rich
    - c) Watson J.D.
    - d) Khorana

P.T.O.



- 6) Four stranded DNA contain high proportion of  
a) Guanosine      b) Adenosine      c) Thymidine      d) All of these
- 7) The new leading strand synthesis runs from \_\_\_\_\_ direction.  
a) 3' to 5'      b) 5' to 3'      c) 3' to 3'      d) 5' to 5'
- 8) In photoreactivation the enzyme photolyase cleaves \_\_\_\_\_ dimers.  
a) G-G      b) C-C      c) T-T      d) A-A
- 9) \_\_\_\_\_ percent of arginine and lysine makes histone proteins basic.  
a) 10 – 20      b) 20 – 30  
c) 10 – 30      d) 10 – 25
- 10) \_\_\_\_\_ enzyme catalyzes the formation of negative supercoils.  
a) DNA polymerase      b) DNA helicase  
c) DNA ligase      d) DNA gyrase
- 11) Genes representing specialized function for specific tissue development are called  
a) Guide gene      b) Luxury gene  
c) Slave gene      d) None of the above
- 12) The smallest chloroplast genome is found in  
a) Red Algae      b) Pine      c) Tobacco      d) Tomato
- 13) The antibiotic ciprofloxacin inhibits \_\_\_\_\_ enzyme.  
a) Bacterial gyrase      b) Bacterial polymerase  
c) Bacterial ligase      d) Bacterial helicase
- 14) In SOS repair the two genes which inhibit cell division are  
a) Lex A and Rec A      b) Sul A and Sul B  
c) Mut S and Mut H      d) Uvr B and Uvr D

2. Solve **any seven** of the following :

14

- 1) Define Tetranucleotide Hypothesis.
- 2) Define Bacteriophages.
- 3) Define Solenoid.
- 4) Define Chargaff's rule.

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- 5) Define Gene.
  - 6) Define Central dogma.
  - 7) Define Gene deserts.
  - 8) Define Linking number.
  - 9) Define DNA damage.
3. A) Attempt **any two** of the following : **10**
- 1) Explain about the molecular nature of Gene.
  - 2) Write about the salient features of double helix of DNA with a neat labelled diagram.
  - 3) Write about Meselson and Stahl's experiment of DNA replication with neat labelled diagram.
- B) Explain in detail about cot curve analysis with neat labelled diagram. **4**
4. Attempt **any two** of the following : **14**
- 1) Describe in brief the organization of DNA in Eukaryotes with a neat labelled diagram.
  - 2) Write in detail about the properties of Genetic Code.
  - 3) Describe in brief the replication of DNA in Prokaryotes with a neat and labelled diagram.
5. Attempt **any two** of the following : **14**
- 1) Describe mismatch and excision repair mechanism of DNA with a neat labelled diagram.
  - 2) Describe in detail DNA replication process in Eukaryotes with a neat labelled diagram.
  - 3) Write in detail about D-loop model of Replication in Mitochondria with a neat labelled diagram.
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**B.Sc. II (Semester – IV) (CGPA) Examination, 2017**  
**BIOTECHNOLOGY**  
**Molecular Biology – II**

Day and Date : Monday, 4-12-2017

Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

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

1. Rewrite the following sentences by using correct alternative : 14

- 1) Acetyl groups are added to specific lysine residues on the core histones by a family of enzymes called
- a) histone acetyl transferases                      b) histone transacetylases  
c) histone methylases                                d) histone methyl transferases
- 2) In lac operon, regulatory protein is encoded by \_\_\_\_\_ gene.
- a) lac 'a'                      b) lac 'i'                      c) lac 'z'                      d) lac 'y'
- 3) In eukaryotic translation process \_\_\_\_\_ is act as initiator tRNA molecule.
- a) tRNA<sup>met</sup>                      b) tRNA<sup>fmet</sup>                      c) tRNA<sup>pro</sup>                      d) tRNA<sup>val</sup>
- 4) \_\_\_\_\_ transfers free amino acids on tRNA molecule.
- a) Aminoacyl tRNA synthetase                      b) DNA glycosylase  
c) peptidyl di-sulphide isomerase                      d) Peptidyl transferase
- 5) Hairpin loop model of tRNA was proposed by
- a) Robertson                      b) R. Holly                      c) Hoagland                      d) W.M. Nirenberg
- 6) Methionine amino acid specified by \_\_\_\_\_ codon.
- a) AGU                      b) AUG                      c) UAG                      d) GUG

P.T.O.



- 7) Chaperons are expressed from \_\_\_\_\_ in response to elevated temperatures of *E. coli*.
- a) Heat shock genes                      b) House-keeping genes  
c) Globin genes                              d) Immunoglobulin genes
- 8) In eukaryotes, 5S rRNA is transcribed by
- a) RNA Polymerase  $\alpha$                       b) RNA polymerase II  
c) RNA Polymerase III                      d) RNA polymerase I
- 9) In prokaryotes, transcription process is elongated by \_\_\_\_\_ of prokaryotic RNA polymerase.
- a) Sigma factor                              b) Rho factor  
c) Pol- $\alpha$                                       d) Core enzyme
- 10) During mRNA processing introns are removed by
- a) Poly 'A' Polymerase                      b) snRNPs  
c) RNA Polymerase III                      d) RNA polymerase I
- 11) \_\_\_\_\_ sequences are present at ribosome binding site on the mRNA molecule.
- a) AGGAGGU      b) TTAGGG      c) CAAT      d) TATA
- 12) Jacob and Monod proposed
- a) Clover leaf model of tRNA                      b) Double helical structure of DNA  
c) Hairpin loop model of tRNA                      d) Operon model
- 13) Many ribosomes are attached along the length of the mRNA molecule, this complex of ribosomes and mRNA is called as
- a) Spliceosome                              b) Polyribosomes  
c) Enhanceosome                              d) Replisome
- 14) The first evidence that RNA molecules were capable of catalyzing chemical reactions was obtained
- a) T.H. Morgan                              b) R.H. Herald  
c) Thomas Cech                              d) H.G. Khorana



2. Answer the following (**any 7**) : **14**
- i) What is consensus sequence ?
  - ii) Write a note on operator gene.
  - iii) What are interrupted genes ?
  - iv) What are exons ?
  - v) What are transcriptional activators ?
  - vi) What is TFIID ?
  - vii) What is antitermination ?
  - viii) Write a note on fidelity of translation.
  - ix) What are translational inhibitors ?
3. A) Answer the following (**any 2**) : **10**
- i) Describe types and functions of RNA polymerases in eukaryotes.
  - ii) Explain mRNA processing in eukaryotes.
  - iii) Describe regulation of translation in eukaryotes.
- B) Explain Clover leaf model of tRNA molecule. **4**
4. Answer **any two** of the following : **14**
- i) Describe enzymology and mechanism of transcription in prokaryotes.
  - ii) Describe regulation of lac operon in bacteria.
  - iii) Describe mechanism of translation in eukaryotes.
5. Answer **any two** of the following : **14**
- i) Explain post-translational modifications in proteins.
  - ii) Describe structure and regulation of trp operon in bacteria.
  - iii) Describe regulation of transcription in prokaryotes with any two suitable examples.
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**B.Sc. – II (Semester – IV) (CGPA) Examination, 2017**  
**BIOTECHNOLOGY**  
**Plant Tissue Culture**

Day and Date : Tuesday, 5-12-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. Choose and write a correct answer from given four alternatives : **14**
- 1) M.S. Medium contains \_\_\_\_\_ component necessary for the cell wall development.  
a)  $\text{CaCl}_2$                       b)  $\text{MgSO}_4$                       c) KI                                      d)  $\text{FeSO}_4$
  - 2) Low auxin concentration results in  
a) Callus formation                                      b) Hairy root formation  
c) Adventitious root formation                      d) None of these
  - 3) Brown colour developed by callus due to phenol can be controlled by  
a) Coconut milk                                      b) Tomato juice  
c) Activated charcoal                                      d) Yeast extract
  - 4) The sterilization of glasswares in dry heat is carried out at \_\_\_\_\_ temperature.  
a)  $121^\circ\text{C} - 130^\circ\text{C}$                                       b)  $160^\circ\text{C} - 180^\circ\text{C}$   
c)  $170^\circ\text{C} - 190^\circ\text{C}$                                       d)  $110^\circ\text{C} - 121^\circ\text{C}$
  - 5) Orchids are generally grown in vitro because of  
a) No seed                                      b) No food reserves  
c) No regulators                                      d) All of these
  - 6) The morphological state that lies between an undifferentiated embryo and shoot is  
a) procorm                      b) protocorm                      c) mericlone                      d) periclone

P.T.O.



- 7) \_\_\_\_\_ cells present in the explant undergo differentiation to different tissues.  
a) Parenchyma    b) Meristematic    c) Aerenchyma    d) All of these
- 8) Callus culture exhibit \_\_\_\_\_ pattern of growth during each passage.  
a) S-shaped    b) L-shaped    c) G-shaped    d) C-shaped
- 9) The pH of enzyme solution used for protoplast isolation is  
a) 4.7 – 6.0    b) 3.0 – 6.0    c) 5.0 – 6.0    d) 4.0 – 6.0
- 10) Meristem tips between \_\_\_\_\_ size produces virus free plants.  
a) 0.2 and 0.5 mm    b) 0.1 and 0.3 mm  
c) 0.2 and 0.3 mm    d) 0.3 and 0.5 mm
- 11) The Somatic Embryo development can be improved by addition of  
a) Glucose    b) Activated charcoal  
c) Auxin    d) Cytokinin
- 12) The term “clone” was first used by  
a) Murashige    b) White    c) Webber    d) Skoog
- 13) Activity of enzyme IAA can be inhibited by adding \_\_\_\_\_ to M.S. Medium.  
a) Phloroglucinol    b) Gelrite    c) Alginate    d) L-Cysteine
- 14) The Gelling agent used by plant tissue culturist is  
a) Difco Bacto Agar    b) Bacto Agar  
c) Agarose    d) Phytagar

2. Solve **any seven** of the following :

14

- 1) Define Totipotency.
- 2) Define Auxin.
- 3) Define Friable callus.
- 4) Define Mericlone.
- 5) Define packed cell volume.
- 6) Define somaclonal-variation.
- 7) Define vermiculite.
- 8) Define vitrification.
- 9) Define cybrid.



3. A) Attempt **any two** of the following : **10**
- 1) Write in detail about history and scope of plant tissue culture.
  - 2) Write in detail about axillary bud culture with neat labelled diagram.
  - 3) Write about the limitations and applications of micropropagation.
- B) Solve : **4**
- Write about the functional laboratory facility in a tissue culture lab.
4. Attempt **any two** of the following : **14**
- 1) Write in detail about the techniques employed during maintenance of aseptic conditions.
  - 2) Write in detail about the media composition used in plant tissue culture with its significance.
  - 3) Write in detail about callus culture and its importance with neat labelled diagram.
5. Attempt **any two** of the following : **14**
- 1) Explain in detail about the plant regeneration through organogenesis with neat labelled diagram.
  - 2) Write in detail about protoplast fusion methods and mechanism of protoplast fusion with neat labelled diagram.
  - 3) Explain in detail about somatic embryogenesis with neat labelled diagram.
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**B.Sc. (Biotechnology) (Semester – IV) Examination, 2017  
ANIMAL TISSUE CULTURE (CGPA)**

Day and Date : Wednesday, 6-12-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. Rewrite the following sentences by choosing correct alternatives : 14

1) Cells removed from animal tissue will continue to grow if supplied with nutrients and growth factors. Process is known as \_\_\_\_\_

- a) Animal cell culture                      b) Plant cell culture  
c) Yeast cell culture                      d) Fungus cell culture

2) In \_\_\_\_\_ year carrel designed suitable flask for routine animal cell culture.

- a) 1915    b) 1923  
c) 1925    d) 1924

3) Which of the following behavior not shown by normal cell in culture ?

- a) Contact inhibition                      b) Monolayer formation  
c) Uncontrolled cell division              d) Anchorage dependent

4) \_\_\_\_\_ serum is routinely used in animal cell culture.

- a) Horse    b) Amphibian  
c) Insect    d) Bovine

5) Plasma clot technique is also known as \_\_\_\_\_ technique.

- a) Watch glass                                      b) Grid  
c) Raft    d) Cyclic exposure



- 6) Transfer of cell from primary culture to form secondary culture is known as \_\_\_\_\_
- a) Trypsinization                      b) Sub culturing  
c) Enzymatic disaggregation        d) Mechanical disaggregation
- 7) When all the cells in culture are in same phase of growth; the process is known as \_\_\_\_\_
- a) Trypsinization                      b) Primary cell culture  
c) Cell synchronization                d) Apoptosis
- 8) \_\_\_\_\_ chemical used to block the cell in S phase to get cell synchrony.
- a) EDTA                                      b) Streptomycin  
c) Tetracyclin                              d) Thymidine
- 9) \_\_\_\_\_ portion of skin is used to produce artificial skin.
- a) Epidermis                                b) Dermis  
c) Epithelial                                d) Endothelial
- 10) The term \_\_\_\_\_ implies a medium that has all its constituents and supplements added is sufficient for the specified use.
- a) MS media                                b) Complete media  
c) Protein media                          d) Serum free media
- 11) The \_\_\_\_\_ content of diploid cells is usually constant, although variations can occur in other content of cells through the cell cycle.
- a) Protein                                     b) Lipid  
c) DNA                                        d) Carbohydrates
- 12) Loss of \_\_\_\_\_ of cells is often indicated by a damaged cell membrane.
- a) Capability                                b) Capacity  
c) Intensity                                 d) Viability
- 13) \_\_\_\_\_ technique is well known in forensic science but is gradually adopted as a standard reference technique for cell line identity in culture collection.
- a) DNA fingerprinting                b) Karyotyping  
c) LDH assay                                d) Lowry assay
- 14) In primary culture, cell divide to give different type of cells by \_\_\_\_\_ process.
- a) Proliferation    b) Differentiation    c) Cultivation        d) Initiation



2. Answer the following (**any seven**) : **14**
- 1) Enlist the characteristics of animal cells in culture.
  - 2) Describe in brief serum free media.
  - 3) Define primary cell culture.
  - 4) Define cell synchronization.
  - 5) Write a note on natural media.
  - 6) Write a note on how much compound is formed in production strategy.
  - 7) Write a note on cell determination by protein.
  - 8) How will you carryout sterilization of apparatus.
  - 9) Write a short note on BSS.
3. A) Answer the following (**any two**) : **10**
- 1) Explain karyotyping for identification of cell line.
  - 2) Give details of warm trypsinization.
  - 3) Discuss analysis of cell cycle by flow cytometer.
- B) Write a note on history of ATC. **4**
4. Answer the following (**any two**) : **14**
- 1) Give details of natural media.
  - 2) Explain laboratory design for ATC.
  - 3) Discuss glycoprotein production from mammalian cells.
5. Answer the following (**any two**) : **14**
- 1) Give details of cold trypsinization.
  - 2) Discuss in detail cell synchronization.
  - 3) Describe efficiency and productivity of culture system.
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**B.Sc. – II (Sem. – IV) (CGPA) Examination, 2017**  
**BIOTECHNOLOGY**  
**Bioenergetics and Enzymology**

Day and Date : Thursday, 7-12-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

- Instructions** : 1) **All questions carry equal marks.**  
2) **Figures to right indicate full marks.**  
3) **Draw neat and labeled diagrams.**

1. Rewrite the following sentences by using correct alternative. 14

- 1) According to \_\_\_\_\_ specificity of enzymes, an enzyme will act on a particular type of chemical bond regardless of the rest of the molecular structure.  
a) absolute      b) group      c) linkage      d) stereochemical
- 2) An inactive enzyme without cofactor is the \_\_\_\_\_.  
a) holoenzyme      b) apoenzyme  
c) prosthetic group      d) ribozyme
- 3) The enzymes from the class of \_\_\_\_\_ catalyze nonhydrolytic addition or removal of functional groups from substrates.  
a) Oxidoreductases      b) Transferases  
c) Hydrolases      d) Lyases
- 4) Reduction potential is the tendency of a chemical species to acquire \_\_\_\_\_.  
a) electrons      b) protons      c) ions      d) neutrons
- 5) In \_\_\_\_\_ inhibition of enzymes, the inhibitor binds with the enzyme substrate complex in the transition state.  
a) competitive      b) noncompetitive  
c) uncompetitive      d) irreversible
- 6) The \_\_\_\_\_ thermodynamic system does transfer energy but not the mass to its surroundings.  
a) isolated      b) closed      c) open      d) independent

P.T.O.



- 7) The reaction's \_\_\_\_\_ ratio is the ratio of product concentrations to reactant concentrations at one given time which may be at equilibrium or not.  
a) velocity      b) mass action      c) kinetic      d) catalytic
- 8) The more \_\_\_\_\_ is the reduction potential, lower is the species' affinity for electrons and tendency to be reduced.  
a) negative      b) positive      c) equilibrium      d) steady
- 9) The flexibility of active site upon binding with substrate can be explained on the basis of \_\_\_\_\_ mechanism.  
a) Induced-fit      b) Single transduction  
c) Michaelis Menten      d) Lock and Key
- 10) Ribozymes are the \_\_\_\_\_ molecules capable of catalyzing specific biochemical reactions.  
a) DNA      b) RNA      c) Protein      d) Ribosome
- 11) The standard free energy change of ATP hydrolysis under standard conditions is \_\_\_\_\_  
a) – 30.3 KJ/mol      b) – 30.3 Cal/mol  
c) – 7.3 Cal/mol      d) – 30.3 Kcal/mol
- 12) Specific activity of an enzyme is the amount of enzyme units per \_\_\_\_\_ of protein.  
a) microgram      b) gram      c) kilogram      d) milligram
- 13) \_\_\_\_\_ is the carbon carbon bond forming reaction among esters in presence of a strong base.  
a) Isomerization      b) Claisen condensation  
c) Elimination      d) Aldol condensation
- 14) The \_\_\_\_\_ modulator regulates enzymes activity by binding at a site other than active site.  
a) transient      b) promoting      c) allosteric      d) catalytic

2. Answer the following (**any 7**) :

14

- i) What is standard free energy change ?
- ii) Write about aldol condensation reaction.
- iii) State lock and key mechanism of enzyme catalysis.
- iv) What is significance of  $V_{max}$  ?

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- v) What is biological role of enzymes ?
- vi) Write about uncompetitive inhibition.
- vii) What are features of active site of an enzyme ?
- viii) Define the terms : coenzyme and prosthetic group.
- ix) What are limitations of Lineweaver Burk plot ?

3. A) Answer the following (**any 2**): **10**

- i) Define redox potential and explain how it can be measured.
- ii) Describe IUB nomenclature and numbering of enzymes with example.
- iii) Write a note on specificity of enzymes.

B) Solve the following : **4**

- Calculate the standard free-energy change of the reaction catalyzed by the enzyme phosphoglucomutase.  
Glucose 1 – phosphate  $\rightleftharpoons$  glucose 6-phosphate  
Given  $R = 8.315 \text{ J/mol}$ ,  $T = 298 \text{ K}$   
Initial concentration : Glucose 1 phosphate : 20 mM, glucose 6 phosphate : 0 mM  
Concentration at equilibrium : Glucose 1 phosphate : 1mM, glucose 6 phosphate : 19 mM.

4. Answer **any two** of the following : **14**

- i) ‘Common Biochemical Reactions’ : Concept : 1, aldol, claisen, isomerisation/ group transfer/ internal rearrangement : 2 M each (any three)
- ii) Factors affecting enzyme activity : temp. 2, pH 2, substrate conc. 2, activator or inhibitor presence : 1 M.
- iii) Enzyme inhibition : reversible and irreversible 1 M, competitive, noncompetitive, uncompetitive : 2 M each.

5. Answer **any two** of the following : **14**

- i) ‘Isoenzymes of lactate dehydrogenase’ concept : 2, clinical importance : 5 M.
- ii) Free energy of hydrolysis of ATP : concept 2, reaction : 2, as an universal currency of free energy in biological systems : 3 M.
- iii) Michaelis Menten equation for monosubstrate enzymatic reaction : 4 M.  
Significance of  $V_{max}$  and  $K_m$  : 1.5 M each.



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**B.Sc. II Biotechnology (Semester – IV) (CGPA) Examination, 2017  
METABOLISM**

Day and Date : Friday, 8-12-2017

Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :** 1) *All questions carry equal marks.*  
2) *Figures to right indicate full marks.*  
3) *Draw neat and labeled diagrams.*

1. Rewrite the following sentences by using correct alternative : 14
- 1) Oxidation of malate to oxaloacetate by malate dehydrogenase, requires \_\_\_\_\_  
a) ATP                      b) NADH                      c) FAD                      d) NAD
  - 2) Under aerobic conditions, pyruvate is converted to acetyl COA by \_\_\_\_\_  
a) hexokinase                      b) pyruvate dehydrogenase  
c) aldolase                      d) phosphoglycerate kinase
  - 3) Net ATP yield of glycolysis is \_\_\_\_\_ ATP molecules per molecule of glucose.  
a) two                      b) three                      c) four                      d) six
  - 4) In eukaryotes, the citric acid cycle occurs in \_\_\_\_\_  
a) mitochondria                      b) nucleus  
c) cytosol                      d) endoplasmic reticulum
  - 5) Which of the following is both ketogenic and glucogenic amino acid ?  
a) valine                      b) tryptophan                      c) lysine                      d) inulin
  - 6) \_\_\_\_\_ is an example of uncoupler of ATP synthesis.  
a) 2, 4 dinitrophenol                      b) DNSA                      c) tryptomycin                      d) IAA
  - 7) The long chain fatty acyl COA molecules are transported across mitochondrial membrane by conjugating with polar \_\_\_\_\_ molecule.  
a) chlorine                      b) citruline  
c) phenylalanine                      d) carnitine

P.T.O.



- 8) The site for oxidative phosphorylation is \_\_\_\_\_ of mitochondria.  
 a) outer membrane                      b) inner membrane  
 c) matrix                                  d) inter membrane space
- 9) De Novo purine nucleotide synthesis begins with \_\_\_\_\_  
 a) PRPP                      b) PEP                      c) GAR                      d) FGAR
- 10) Transamination is the process where \_\_\_\_\_  
 a) carboxyl group is transferred from amino acid  
 b) amino acid breakdown takes place  
 c) amino acid synthesis takes place  
 d) amino group is transferred from amino acid
- 11) In pentose phosphate pathway \_\_\_\_\_ is the monophosphate sugar used for shunting into other sugars.  
 a) fructose 6 phosphate                      b) glucose 6 phosphate  
 c) sedoheptulose 7 phosphate                      d) erythrose 4 phosphate
- 12) Fatty acids are covalently linked with \_\_\_\_\_ carrier proteins during their synthesis.  
 a) methyl                      b) ethyl                      c) butyryl                      d) acyl
- 13) The light reactions of photosynthesis occur in the \_\_\_\_\_  
 a) thalakoind membrane                      b) stroma  
 c) epidermis                      d) cuticle
- 14) The nonprotein amino acid \_\_\_\_\_ acts as a carrier of amino and carbon atoms during urea cycle.  
 a) aminopteridine                      b) butadiene                      c) ornithine                      d) hypoxanthine

2. Answer the following :

14

- Draw ultrastructure of mitochondria.
- State the chemiosmotic hypothesis for oxidative phosphorylation.
- Give a flowchart of cyclic photophosphorylation.
- What is the fate of pyruvate after glycolysis ?
- Which irreversible steps of glycolysis are bypassed in gluconeogenesis ?
- Give two examples of ketogenic amino acids.
- How fatty acids are transported into mitochondria during their breakdown ?

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3. A) Answer the following (**any 2**) : **10**
- i) Explain the biosynthesis of fatty acids.
  - ii) Describe gluconeogenesis. Explain its reciprocal regulation with glycolysis.
  - iii) Describe general reactions of amino acid metabolism.
- B) Describe ATP synthesis by ATP synthase complex. **4**
4. Answer **any two** of the following : **14**
- i) Add an account on glycogen metabolism.
  - ii) Write a note on tricarboxylic acid cycle.
  - iii) Describe 'Calvin cycle' of photosynthesis.
5. Answer **any two** of the following : **14**
- i) Write a note on oxidative phosphorylation.
  - ii) Describe biosynthesis and regulation of purines.
  - iii) Describe beta oxidation of saturated fatty acids. Add a note on ATP yield from palmitic acid oxidation.
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**B.Sc. – III (Semester – V) (Biotechnology) Examination, 2017**  
**ENGLISH (Compulsory) (CGPA)**  
**Breakthrough**

Day and Date : Tuesday, 14-11-2017

Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

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

1. A) Choose the correct alternative.

10

- 1) Which of the following statements about the Press is true ?
  - a) The newspapers are owned by poor men
  - b) People get their opinions from the newspapers
  - c) The Press is free
  - d) Honest editors and journalists are rewarded
- 2) According to G.B. Shaw, the average parson teaches \_\_\_\_\_ to the merely rich.
  - a) honesty
  - b) equality
  - c) deference
  - d) morality
- 3) *The Gettysburg Address* was delivered by President Abraham Lincoln on
  - a) 19 November 1863
  - b) 19 November 1865
  - c) 19 July 1863
  - d) 19 July 1865
- 4) Abraham Lincoln visited Gettysburg battlefield to
  - a) to solve the problems of soldiers
  - b) to dedicate a cemetery for the martyrs of the civil war
  - c) to mourn the death of soldiers who died in the war
  - d) to thank American people for their support in the civil war
- 5) \_\_\_\_\_ makes Abou Ben Adhem bold when he sees an angel in his room.
  - a) His love for god
  - b) His love for an angel
  - c) Exceeding peace
  - d) The moonlight in his room

P.T.O.





- 5) What was the condition of gifted women in Shakespeare's age ?
  - 6) Why did women writers choose to remain anonymous ?
  - 7) What is G.B. Shaw's opinion of the Press ?
  - 8) Why was it impossible for any woman to have the genius of Shakespeare ?
  - 9) What was the outcome of the American Civil War ?
3. A) Answer **any two** of the following : **8**
- 1) Why does Walt Whitman use the image of a voyage to lament the death of a leader ?
  - 2) What is the moral message the poem *Abou Ben Adhem* tries to convey ?
  - 3) What is the significance of the title of the poem *O Captain ! My Captain !* ?
- B) Write short reports on **any two** of the following : **6**
- 1) The Zoo Festival of your college.
  - 2) A Ten-Day Personality Development Workshop organized in your college.
  - 3) Your visit to a Botanical Garden.
4. Answer **any one** of the following : **14**
- 1) Prepare a presentation consisting of five charts or slides to promote a "Vacuum Cleaner" in the market.
  - 2) Write a presentation on the topic "Importance of Self-Discipline" using charts transparencies or slides.
5. Write a transcript of group discussion on the topic "Goods and Services Tax : A Step towards Progress ?" **14**
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Set **P**

**B.Sc. (Part – III) (Semester – V) (CGPA) Examination, 2017**  
**BIOTECHNOLOGY**  
**Plant Development**

Day and Date : Wednesday, 15-11-2017  
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

- N.B. :**
- 1) Figures to the **right** indicate **full** marks.
  - 2) Draw a **neat**, well labelled, **complete** diagram **wherever** necessary.
  - 3) Use of calculators, cell phones, or any other electronic gadgets is **prohibited**.
  - 4) **All** questions are **compulsory**.

1. Rewrite the following sentences by using correct alternative : 14
- 1) If pollination takes place on surface of water is known as
    - a) Hypohydrophily
    - b) Epihydrophily
    - c) Entomophily
    - d) Anemophily
  - 2) Microspore mother cell is
    - a) Haploid
    - b) Diploid
    - c) Triploid
    - d) Tetraploid
  - 3) The development of diploid embryo sacs from the cells of the nucellus or integument is called
    - a) Generative apospory
    - b) Somatic apospory
    - c) Apogamy
    - d) Syngamy
  - 4) In cellulose the glucose molecules are linked to each other by
    - a)  $\beta$  1-6 linkage
    - b)  $\alpha$  1-4 linkage
    - c)  $\beta$  1-4 linkage
    - d)  $\alpha$  1-6 linkage

P.T.O.





- 5) \_\_\_\_\_ is a product of metabolism of the amino acid methionine and is produced in greater amounts in senescing tissues than in young or mature tissues.
- a) Auxin  
b) Cytokinins  
c) Ethylene  
d) Gibberellins
- 6) Exine of pollen is composed of
- a) Sporopollenin  
b) Chitin  
c) Peptidoglycan  
d) Collagen
- 7) Polyembryony was first time found by
- a) Avery  
b) Arber  
c) Antony Van Leewenhoek  
d) Nawaschin
- 8) Application of embryo culture is
- a) Clonal propagation  
b) Production of triploid  
c) Overcoming hybridization  
d) Haploid production
- 9) Callus culture formation is promoted by
- a) Excess of NAA  
b) Absence of salt  
c) Darkness and subculturing  
d) Proper light and subculturing
- 10) \_\_\_\_\_ is a cytokinin.
- a) IAA  
b) Thidiazuron  
c) Dicamba  
d) Brassionosteroid
- 11) After fertilization, egg-cell develops into
- a) Male gametes  
b) Female gametes  
c) Oospore  
d) Fruit
- 12) Development of shoot and root in tissue culture is determined by
- a) Cytokinin to auxin ratio  
b) Enzymes  
c) Plant nutrients  
d) Temperature
- 13) \_\_\_\_\_ ovule is the most common type of ovule found in Angiosperms.
- a) Orthotropous  
b) Anatropous  
c) Hemianatropous  
d) Circinotropous
- 14) A sexual seeds which produce progeny identical to the female parent are called as \_\_\_\_\_ seeds.
- a) Parthenocarpic  
b) Apomictic  
c) Hybrid  
d) Artificial



2. Answer **any seven** of the following : 14
- 1) Define Anemophily. Give an example of it.
  - 2) What is pollen germination ? Enlist different modes of entry of pollen tube into the ovule.
  - 3) Draw a neat, well labelled diagram of microsporangium.
  - 4) What are the practical applications of cytokinin ?
  - 5) What is endosperm ? Enlist different types of endosperm according to development.
  - 6) Define seed and write the importance of seed.
  - 7) Explain the cryogenic storage of pollen grains.
  - 8) What is apomixis ? Enlist its types.
  - 9) Why Arabidopsis thaliana is used as model plant ?
3. A) Answer **any two** of the following : 10
- 1) Explain shoot pattern in Angiosperms.
  - 2) Describe method of embryo culture.
  - 3) Discuss reserve food substances in endosperm.
- B) Discuss applications of Gibberellins. 4
4. Answer **any two** of the following : 14
- 1) What is apomixis and give detailed account on it ?
  - 2) What is polyembryony and give detailed account on it ?
  - 3) Describe patterns of development in primary xylem and phloem.
5. Answer **any two** of the following : 14
- 1) Explain in detail – Development of female gametophyte.
  - 2) Describe development of fruit.
  - 3) What is self-incompatibility ? Comment on physiology and biochemistry in incompatibility.
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Set **P**

**B.Sc. – III (Semester – V) (CGPA) Examination, 2017**  
**BIOTECHNOLOGY**  
**Animal Development**

Day and Date : Thursday, 16-11-2017  
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

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

1. Rewrite the following sentences by using correct alternative : **14**

- 1) In, 1940 \_\_\_\_\_ proposed the metabolic axial gradient theory.  
a) Weismann      b) Roux      c) Driesch      d) Child
- 2) Weismann recognized units of heredity as \_\_\_\_\_  
a) Genes      b) Determinants      c) Factors      d) All of these
- 3) Conversion of spermatids into sperms is called \_\_\_\_\_  
a) Spermatogenesis      b) Formation of spermatids  
c) Spermiogenesis      d) All of these
- 4) Testosterone is secreted by \_\_\_\_\_ cells.  
a) Sertoli      b) Leydig  
c) Sperm      d) Spermatogonial
- 5) Cortical granules contains \_\_\_\_\_  
a) proteins      b) acid mucopolysaccharides  
c) lipids      d) fatty acids and glycerol
- 6) Frog eggs shows \_\_\_\_\_ type of cleavage.  
a) Incomplete      b) Partially complete  
c) Complete      d) None of these

P.T.O.





2. Answer the following (**any 7**): **14**
- i) What is preformation theory ?
  - ii) What are free radicals ?
  - iii) What is artificial insemination ?
  - iv) Write a note on spermiogenesis.
  - v) Write a note on structure of typical ovum.
  - vi) Write characteristics of cleavage.
  - vii) What are morphogenetic cell movements ?
  - viii) Write on “Hormonal control of oogenesis”.
  - ix) Write a note on differentiation.
3. A) Answer **any two** of the following : **10**
- i) Describe T. S. of testis with neat labeled diagram.
  - ii) Describe regeneration in microbes, protozoa with suitable example.
  - iii) Describe post-fertilization changes in egg cytoplasm.
- B) Describe blastulation in polylecithal egg with suitable example. **4**
4. Answer **any two** of the following : **14**
- i) Describe different types of cancer with suitable examples.
  - ii) Describe process of gastrulation in frog with neat labeled diagram.
  - iii) Explain process of spermatogenesis with neat labeled diagram.
5. Answer **any two** of the following : **14**
- i) Describe process acrosome reaction and cortical reaction.
  - ii) Explain different types of cleavage with suitable examples.
  - iii) Describe metamorphosis with any two suitable examples.
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Set **P**

**B.Sc. (Biotechnology) (Part – III) (Semester – V) (CGPA) Examination, 2017  
BIOINFORMATICS AND NANOTECHNOLOGY**

Day and Date : Friday, 17-11-2017

Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

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

1. Rewrite the sentence using correct alternative given below : **14**
- 1) \_\_\_\_\_ is developed by NCBI to retrieve information from database.  
a) SRS                      b) Entrez                      c) Yahoo                      d) Google
  - 2) \_\_\_\_\_ alignment is widely used for prediction of phylogenetic relationship.  
a) Global-pairwise                      b) Local-pairwise  
c) Global-multiple                      d) Local-multiple
  - 3) High energy ball milling is a \_\_\_\_\_ method of nanoparticle synthesis.  
a) Physical                      b) Chemical  
c) Biological                      d) Natural
  - 4) The term nano was first coined by  
a) Alexander Fleming                      b) John Tyndall  
c) Richard Fynmann                      d) Rutherford
  - 5) SWISS-PROT represents \_\_\_\_\_ database.  
a) Nucleic acid sequence                      b) Protein sequence  
c) Genome sequence                      d) Cancer chromosome
  - 6) \_\_\_\_\_ is a literature database.  
a) EMBL                      b) PATCHx                      c) PMC                      d) NCBI
  - 7) In \_\_\_\_\_ approach, the atoms and molecules are assembled so as to obtain a desired nanostructure.  
a) Top down                      b) Bottom up  
c) Traditional                      d) Modern

P.T.O.



- 8) Melt mixing is a \_\_\_\_\_ method of nanomaterial synthesis.  
a) Vapor based    b) Biological    c) Deposition    d) Mechanical
- 9) Increasing the stability of nanoparticles by coating them with other molecules is known as the \_\_\_\_\_ of nanoparticles.  
a) Tagging    b) Capping  
c) Layering    d) Probing
- 10) The suitably modified polymeric nanoparticles in the form of \_\_\_\_\_ loaded with drugs are able to pass the blood brain barrier.  
a) Liposomes    b) Fullerenes  
c) Quantum dots    d) Nanotubes
- 11) For antibacterial activity \_\_\_\_\_ nanoparticles are widely used.  
a) Manganese    b) Cobalt  
c) Silver    d) Molybdenum
- 12) \_\_\_\_\_ is not a nanoparticle in our body.  
a) DNA    b) Mitochondria  
c) Ribosome    d) Insulin
- 13) \_\_\_\_\_ is not a DNA database.  
a) Swissprot    b) GenBank    c) DDBJ    d) EMBL
- 14) Clustal W is used for \_\_\_\_\_ alignment.  
a) Local-global    b) Local    c) Global    d) Multiple

2. Answer **any seven** of the following :

14

- 1) What is consensus sequence ? Give example.
- 2) Write a note on BLOSUM matrices.
- 3) What is CATH database ?
- 4) What is lithography ?
- 5) Enlist the names of different nanostructures.
- 6) What is quantum mechanics ?
- 7) What is the difference between top down and bottom up approach of nanomaterial synthesis ?
- 8) Write a note on BLAST.
- 9) Write a note on GenBank flat file.

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3. A) Answer **any two** of the following : 10
- 1) Write a note on Entrez.
  - 2) Explain how the growth of nanocrystals occur.
  - 3) Explain the primary protein sequence databases.
- B) Describe the role of nanomaterials in drug delivery. 4
4. Answer **any two** of the following : 14
- 1) Illustrate different applications of Bioinformatics.
  - 2) Describe different lithography techniques used to make nanostructures.
  - 3) Describe biological method for synthesis of nanomaterials.
5. Answer **any two** of the following : 14
- 1) What is structural database ? Explain any three Protein Structural Databases.
  - 2) Add a note on quantum idea and quantum mechanics.
  - 3) What is sequence alignment ? Explain multiple sequence alignment using Clustal X.
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**B.Sc. (Part – III) (Semester – V) (CGPA) Examination, 2017**  
**BIOTECHNOLOGY**  
**Recent Trends in Biotechnology**

Day and Date : Saturday, 18-11-2017  
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

- Instructions :** 1) **All questions are compulsory.**  
2) **All questions carry equal marks.**  
3) **Draw neat and labelled diagrams wherever necessary.**

1. Rewrite the sentences selecting most correct answer from the given options : **14**
- 1) The process of converting environmental pollutants into harmless products by naturally occurring microbes called  
a) Ex-situ bioremediation                      b) Intrinsic bioremediation  
c) Extrinsic bioremediation                      d) None of these
  - 2) Stirred tank bioreactors have been designed for  
a) Purification of the product  
b) Availability of oxygen throughout the process  
c) Addition of preservatives to the product  
d) Ensuring anaerobic conditions in the culture vessel
  - 3) The three major types of ethical issues include except  
a) Communication issues                      b) Systemic issues  
c) Corporate issues                      d) Individual issues
  - 4) Environmental biotechnology involves  
a) The use of microbes to clean up the environment  
b) Bioremediation  
c) The study of benefits and hazards associated with GMM's  
d) All of these
  - 5) Restriction endonuclease enzyme is used in \_\_\_\_\_ mutagenesis.  
a) Cassette                      b) Single primer PCR directed  
c) Two primer PCR directed                      d) Random
  - 6) A river water with high BOD value is  
a) Highly productive                      b) Highly clean  
c) Highly polluted                      d) Good for consumption
  - 7) Biodegradation of specific compounds by inoculating bacterial cell is known as  
a) Bioaugmentation                      b) Bioremediation  
c) Phytoremediation                      d) Energy plantation



- 8) Toxicants are absorbed by the body by  
a) Inhalation      b) Skin      c) Ingestion      d) All of these
- 9) Petroleum is a mixture of  
a) Sulfure and nitrogen      b) Hydrocarbons  
c) Oxygen and water      d) Nitrogen and silver
- 10) In-situ bioremediation involves  
a) Degradation of pollutants by microbes directly at the site of pollution  
b) Removal of pollutants and collection at another place to facilitate microbial degradation  
c) Degradation pollutants by genetically engineered microbes  
d) None of these
- 11) Bioremediation uses  
a) Microorganisms with natural capacities to break down material  
b) Added O<sub>2</sub>, water and nutrients to increase rates of degradation  
c) Organisms such as *Pseudomonas* and *Bacillus*  
d) All of above
- 12) \_\_\_\_\_ is a physical method of immobilization.  
a) Microencapsulation      b) Entrapment  
c) Adsorption      d) Covalent bonding
- 13) The main purpose of Biotransformation is to convert or chemically modify compounds into more  
a) Lipophilic      b) Hydrophylic      c) Toxic      d) Both (a) and (b)
- 14) \_\_\_\_\_ is not the goal of Human Genome Project.  
a) To sequence the genomes of selected model organism  
b) Eliminate all diseases  
c) To sequence EST fragments of cDNA in both humans and mice  
d) Develop computational tools for analyzing sequence information

2. Answer **any seven** of the following :

**14**

- 1) Define the term LD<sub>50</sub>.
- 2) Enlist the industrial applications of enzyme engineering.
- 3) State factors affecting toxicity.
- 4) State the role of lactase enzyme.
- 5) Write a note on bioleaching.
- 6) Describe the routes of toxicants ion human body.



- 7) Enlist carries used for enzyme immobilization.
  - 8) Write a note on CCAC guideline on animal welfare.
  - 9) Give short note on NOEL.
3. A) Answer **any two** of the following. **10**
- 1) What is enzyme immobilization ? Give advantages and disadvantages of immobilized enzymes.
  - 2) What are the ethical issues of Human Genome project ?
  - 3) Explain the process of Bioaugmentation for contaminated soil.
- B) What is the principle of toxicology ? Give the types of xenobiotic compounds and explain their effects. **4**
4. Answer **any two** of the following. **14**
- 1) Explain the role of organs involved in detoxification mechanism.
  - 2) Give the types of enzyme immobilization with its industrial applications.
  - 3) Define Phytoremediation. Explain phytoremediation for soil decontamination.
5. Answer **any two** of the following. **14**
- 1) Explain the ethical issues of biodiversity.
  - 2) Give an account on Industrial waste water biotreatment technologies.
  - 3) Define Bioremediation. Give the types of Bioremediation and explain any one of them with suitable example.
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**B.Sc. – III (Semester – VI) (Biotechnology) (CGPA) (New) Examination, 2017  
ENGLISH (Compulsory)  
Breakthrough**

Day and Date : Tuesday, 31-10-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. A) Choose the correct alternative :

10

- 1) Which of the following statements is not true ?
  - a) Tom had been dreading the ridicule of Ben Rogers the most
  - b) Ben Rogers was unwilling to whitewash the fence
  - c) Tom believed that work consists of whatever a body is obliged to do
  - d) Tom succeeded in making other boys believe that whitewashing the fence is very difficult
- 2) Tom was given the task of whitewashing the fence on \_\_\_\_\_ morning.
  - a) Sunday
  - b) Monday
  - c) Saturday
  - d) Friday
- 3) Guy de Maupassant was a great \_\_\_\_\_ short story writer and novelist.
  - a) American
  - b) French
  - c) German
  - d) Russian
- 4) The ball party that M and MmeLoisel attended took place on \_\_\_\_\_.
  - a) Sunday, January 18
  - b) Monday, January 17
  - c) Sunday, January 17
  - d) Monday, January 18
- 5) Thomas Bullfinch has taken the story of Pyramus and Thisbe from \_\_\_\_\_.
  - a) Ovid's *Metamorphoses*
  - b) Chaucer's *The Legend of Good Women*
  - c) Shakespeare's *A Midsummer Night's Dream*
  - d) Giovanni Boccaccio's *On Famous Women*

P.T.O.



- 6) Which of the following statements is not true ?
- Pyramus was the handsomest youth
  - Thisbe was the fairest maiden
  - Their parents occupied adjoining houses
  - They eloped and married as their parents were against their marriage
- 7) The poem *In The Bazaars of Hyderabad* ends with the line \_\_\_\_\_
- Daggers with handles of jade
  - Scabbards of gold for the king
  - To perfume the sleep of the dead
  - Chaplets to garland his bed
- 8) In the poem *In The Bazaars of Hyderabad* Goldsmiths make girdles of gold for \_\_\_\_\_
- The king
  - Dancers
  - The queen
  - The bridegroom
- 9) Whom does the speaker in the poem *On Virtue* ask not to sink into despair ?
- Virtue
  - Chastity
  - Soul
  - Glory
- 10) The speaker in the poem *On Virtue* asks his/her soul to court virtue for \_\_\_\_\_
- her promised bliss
  - her promised glory
  - her promised chastity
  - her promised happiness
- B) Do as directed :
- Everybody knows that Kapil Sharma is a good comedian.  
(Change it into a simple sentence)
  - You scratch my back and I will scratch yours.  
(Change it into a complex sentence)
  - This is a very interesting book.  
(Add a question tag)
  - Coffee is too hot to drink it.  
(Make it negative without changing the meaning)



2. Answer **any seven** of the following questions in short. 14
- 1) What is the moral of the story *Whitewashing the Fence* ?
  - 2) What role did the wall play in the life of Pyramus and Thisbe ?
  - 3) Who do you think responsible for the tragic deaths of Pyramus and Thisbe ?
  - 4) What did Mathilde and Loisel do after the loss of *the necklace* ?
  - 5) Why was Mathilde reluctant to go to the party ?
  - 6) Bring out the significance of the title *The Necklace*.
  - 7) What was Tom's offer for Jim ?
  - 8) Describe the character of Tom.
3. A) Answer **any two** of the following : 8
- 1) Describe the scene of the bazaar in Hyderabad in your own words.
  - 2) What appeal does Phillis Wheatley make to virtue ?
  - 3) What is personification ? How is it used in the poem On Virtue ?
- B) Answer **any two** of the following : 6
- 1) You are a college student. You spend most of your leisure time in watching T.V. serials and in chatting on internet. You have failed in the previous Semester. How will you manage your time in order to clear both the semesters ?
  - 2) Imagine that you have recently been quarrelling a lot with your brother on the issue of property and want to make your relationship with him better. How will you handle the problem ?
  - 3) Sachin has been appointed as a branch manager in one of the branches of Bank of India in Chennai and he moves there from Pune, where he grew up. He is unfamiliar with the city and its weather, people, food, language and culture. Suggest ways in which Sachin can successfully adapt himself to the new environment where he has to live and work.
4. Write in detail the description of your favourite teacher. Remember to convey the character, thoughts and mood of him/her. 14
- OR
- Imagine that you are waiting for a bus at the bus stop and you witness an accident in which three children die. Narrate in detail the accident.



5. Read the following passage and write the summary of it.

14

Although our age far surpasses all previous ages in knowledge, there has been no correlative increase in wisdom. But agreement ceases as soon as we attempt to define 'wisdom' and consider means of promoting it.

There are several factors that contribute to wisdom. Of these I should put first a sense of proportion : the capacity to take account of all the important factors in a problem and to attach to each its due weight. This has become more difficult than it used to be owing to the extent and complexity of the specialized knowledge required of various kinds of technicians. Suppose, for example, that you are engaged in research in scientific medicine. The work is difficult and is likely to absorb the whole of your intellectual energy. You have no time to consider the effect which your discoveries or inventions may have outside the field of medicine. You succeed in enormously lowering the infant death-rate, not only in Europe and America, but also in Asia and Africa. This has the entirely unintended result of making the food supply inadequate and lowering the standard of life in the most populous parts of the world. To take an even more spectacular example, you study the composition of the atom from a disinterested desire for knowledge and incidentally place in the hands of powerful lunatics the means of destroying the human race. In such ways the pursuit of knowledge may become harmful unless it is combined with wisdom and wisdom in the sense of comprehensive vision is not necessarily present in the pursuit of knowledge.

Comprehensiveness alone, however, is not enough to constitute wisdom. There must be, also, a certain awareness of the ends of human life. This may be illustrated by the study of history. Many eminent historians have done more harm than good because they viewed facts through the distorting medium of their passions. Hegel's philosophy of history which did not suffer from any lack of comprehensiveness sought to inculcate the lesson that from the year 400 A.D. down to his own time, Germany had been the most important nation and the standard-bearer of progress in the world. Perhaps one could stretch the comprehensiveness that constitutes wisdom to include not only intellect but also feeling. It is by no means uncommon to find men whose knowledge is wide but whose feelings are narrow. Such men lack what I am calling wisdom.



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**B.Sc. (Biotechnology) (Part – III) (Semester – VI) (New-CGPA)  
Examination, 2017  
TOOLS AND TECHNIQUES**

Day and Date : Wednesday, 1-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. Rewrite the sentence using correct alternative given below. 14
- 1) Restriction enzymes cleave the DNA at \_\_\_\_\_ sites.  
a) Nicks                      b) Single strand    c) Palindromic    d) Ends
  - 2) Maxam Gilbert method is used for sequencing of  
a) RNA                      b) DNA                      c) Protein                      d) Other biomolecules
  - 3) \_\_\_\_\_ is a technique in which minisatellite sequences are used for analysis.  
a) DNA fingerprinting                      b) Dot blot  
c) Autoradiography                      d) DNA Hybridization
  - 4) A \_\_\_\_\_ is a short or long length of ssRNA or DNA.  
a) Nucleic acid    b) Isotope                      c) cDNA                      d) Probe
  - 5) A rapid method of amplifying a length of target DNA is \_\_\_\_\_  
a) PCR                      b) Transformation  
c) Labeling                      d) Transfection
  - 6) PBR322 is a  
a) Cosmid                      b) Natural plasmid  
c) Constructed Plasmid                      d) Phagemid
  - 7) The Crown Gall disease caused in plants is due to  
a) *Archaeobacterium*                      b) *Agrobacterium Tumefaciens*  
c) *Agrobacterium Rhizogenes*                      d) *Aerogenes*

P.T.O.





- 8) In blotting techniques nucleic acids are transferred to the \_\_\_\_\_ membrane.
- a) Cell                  b) Cellulose              c) Nitrocellulose      d) None of these
- 9) Taq DNA polymerase is a \_\_\_\_\_ enzyme used in PCR.
- a) Thermolabile                                      b) Thermostable  
c) Halophilic    d) Halophobic
- 10) The technique of using electric current to allow entry of DNA into a cell is called
- a) Electrophoresis                                  b) Electroporation  
c) Microinjection                                  d) Macroinjection
- 11) Type-II restriction endonucleases are most commonly used in \_\_\_\_\_ technique.
- a) PCR    b) RFLP  
c) Western blotting                                  d) Ligation
- 12) \_\_\_\_\_ is a self replicating entity used as a vector in gene transfer technique.
- a) Plasmid                  b) Virus                  c) Bacteriophage      d) Probe
- 13) Insert size of 400-450 Kb can be incorporated in a
- a) Cosmid                  b) Virus                  c) Plasmid                  d) YAC
- 14) C-DNA library is prepared from
- a) r-RNA                  b) t-RNA                  c) m-RNA                  d) sn-RNA

2. Answer **any seven** of the following :

**14**

- i) What is Primer walking ?
- ii) Explain the method of PEG mediated gene transfer technique.
- iii) Give the role of DNA modifying enzymes in cloning.
- iv) Give the characteristics of a plasmid vector.
- v) Explain the role of Taq DNA polymerase.
- vi) Explain autoradiography.
- vii) Discuss the role of reverse transcriptase enzyme.
- viii) Give the significance of transfection technique.
- ix) Explain the role restriction enzymes.



3. A) Write the short answers (**any two**) : 10
- 1) Describe the technique of PCR. Write its applications.
  - 2) How is selection of the recombinant clones done ?
  - 3) Write down the role of different enzymes in gene cloning.
- B) Write short note on Sangers Dideoxy method of sequencing. 4
4. Write short notes on **any two** of the following : 14
- 1) Write an account on sequencing of genes.
  - 2) Describe the methods of transformation, transduction and transfection.
  - 3) Differentiate between agarose gel electrophoresis and PAGE.
5. Attempt **any two** of the following : 14
- 1) Enlist the names of cloning vectors with explanation.
  - 2) Explain the various methods of direct gene transfer.
  - 3) Explain the technique of RAPD.
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**B.Sc. (Semester – VI) (Biotechnology) (New CGPA) Examination, 2017**  
**APPLICATIONS**

Day and Date : Thursday, 2-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. Rewrite the following sentences by choosing correct alternatives. 14

- 1) \_\_\_\_\_ compounds are chemicals which are foreign to the biosphere.  
a) Xenobiotic                                      b) Transgenic  
c) Gaseous    d) Fluid
- 2) A microbial population growing on one compound may transform a contaminating chemical that can not be used as a 'C' source, process is known as \_\_\_\_\_  
a)  $\alpha$  metabolism                                      b) Co-metabolism  
c)  $\beta$  metabolism                                        d) Metabolism
- 3) Interferon  $\alpha$  and  $\beta$  are synthesized in cells that have been exposed \_\_\_\_\_  
a) Bacteria      b) Fungus      c) Viruses      d) Protozons
- 4) \_\_\_\_\_ is the second generation of rDNA technology.  
a) Engineering                                        b) Lipids Engineering  
c) Metallurgy    d) Protein Engineering
- 5) \_\_\_\_\_ must bind to a specified mRNA and prevent translation of the protein.  
a) Antisense RNA                                      b) Antisense DNA  
c) DNA    d) RNA
- 6) The addition of \_\_\_\_\_ to animal cell reduces the expression of the gene from which double stranded RNA sequence is derived.  
a) Ds DNA      b) Ds RNA      c) Ss DNA      d) Ss RNA



- 7) Subunit vaccine for cholera is prepared by \_\_\_\_\_ epitope.  
a) Cholera toxin C subunit      b) Cholera toxin A subunit  
c) Cholera toxin B subunit      d) Cholera toxin D subunit
- 8) Genetically engineered *X. Campestris* was grown on whey due to insertion of \_\_\_\_\_ gene.  
a) *Bacillus lac ZY*      b) *E. coli lac ZY*  
c) *Fungus lac ZY*      d) *Pseudomonas lac ZY*
- 9) Crystal shape of CRY I A(a) is \_\_\_\_\_  
a) Bipyradimal    b) Cuboidal    c) Flat    d) Irregular
- 10) \_\_\_\_\_ portion is 3000 times sweeter than sucrose.  
a) Morphin      b) Monellin      c) Casein      d) BSA
- 11) Compounds which are foreign to \_\_\_\_\_ exhibiting or having unnatural structural features are known as xenobiotics.  
a) Earth      b) Soil      c) Life      d) Water
- 12) Interferon  $\alpha$  family is coded by \_\_\_\_\_ number of genes.  
a) 10      b) 11      c) 12      d) 13
- 13) \_\_\_\_\_ is an example of disease which may be cured by antisense RNA as therapeutic agent.  
a) Malignant glioma      b) Diabetes  
c) Turners syndrome      d) Cystic fibrosis
- 14) \_\_\_\_\_ is an infectious agent from HSV1 which elicits the antibodies that react against intact form of infectious agent.  
a) Envelope glycoprotein B      b) Envelope glycoprotein D  
c) Envelope glycoprotein A      d) Envelope glycoprotein C

2. Answer the following (**any seven**) :

14

- 1) Write a short note on Xenobiotics.
- 2) Explain antisense RNA.
- 3) Write a note on increase in enzyme activity.
- 4) Explain attenuated vaccine.
- 5) Explain in brief vaccines against bacteria.
- 6) Write a note on Interfering RNA.
- 7) Write a short note on biosynthesis of rubber.
- 8) Write a short note on edible vaccine.
- 9) Enlist the applications of transgenic animals.



3. A) Answer the following (**any two**) : **10**
- 1) How will you increase enzyme stability by genetic engineering ?
  - 2) Explain cloning livestock by nuclear transfer.
  - 3) Write a note on synthesis of human growth hormone.
- B) Explain synthesis of human interferon. **4**
4. Answer the following (**any two**) : **14**
- 1) Explain development of senescence tolerant plants.
  - 2) Discuss in detail development of herbicide resistant plants.
  - 3) Give details of transgenic mice.
5. Answer the following (**any two**) : **14**
- 1) Describe microbial degradation of xenobiotics.
  - 2) Describe in detail subunit vaccines against FMD.
  - 3) Discuss vector vaccines directed against viruses.
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**B.Sc. III Biotechnology (New CGPA) (Semester – VI) Examination, 2017  
FERMENTATION TECHNOLOGY**

Day and Date : Friday, 3-11-2017  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. Rewrite the sentences by selecting correct answer from the given alternatives. **14**

- i) Stock culture is maintained by \_\_\_\_\_  
a) tyndallization                      b) pasteurization  
c) lyophilization                      d) sterilization
- ii) Microbial inhibition spectrum of antibiotic is determined by \_\_\_\_\_  
a) Crowded plate                      b) SPC  
c) Giant colony                      d) Indicator
- iii) Solvent extraction is used for recovery of \_\_\_\_\_  
a) Amylase                      b) Alcohol  
c) Penicillin                      d) Citric acid
- iv) Economic fermentation of an industrial product is done by using \_\_\_\_\_  
a) Waste as a raw material                      b) Synthetic media  
c) Living media                      d) Semi synthetic media
- v) Laboratory scale fermentor \_\_\_\_\_ liters capacity.  
a) 50 – 100                      b) 1 – 2                      c) 1,00,000                      d) None of these
- vi) \_\_\_\_\_ is used in diffusion assays.  
a) Paper-disc                      b) Acid  
c) Liquid medium                      d) None of these
- vii) Turbidity due to growth of micro-organism is determined by \_\_\_\_\_  
a) pH meter                      b) microscope  
c) spectro-photometer                      d) none of these

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- viii) Amylase enzyme is produced by using \_\_\_\_\_ substrate.
- a) Starch    b) Lactose  
c) Yeast extract                                        d) Glucose
- ix) Bioinsecticide is produced by using \_\_\_\_\_
- a) Bacillus subtilis    b) Bacillus cereals  
c) Bacillus thuringiensis    d) Bacillus licheniformis
- x) \_\_\_\_\_ are present in the fermentor to avoid vortex formation.
- a) Baffles    b) Sparger  
c) Impeller    d) Antifoam agents
- xi) End point determination assay are meant for \_\_\_\_\_ substances.
- a) Amino acids    b) Vitamins  
c) Antibiotic    d) None of these
- xii) Fermentation economics is based on \_\_\_\_\_
- a) Incubation period    b) Medium constituent  
c) Recovery    d) All of these
- xiii) Head space at the top of fermentor allows liquid medium for \_\_\_\_\_
- a) splashing                        b) foaming                        c) aeration                        d) all of these
- xiv) In alcohol industry liquefaction of starch before the addition of malt saccharification carried by \_\_\_\_\_
- a)  $\alpha$ -amylases                        b) protease                        c) lipase                        d) nuclease

2. Explain **any seven** of given below :

14

- i) Aeration and agitation.  
ii) Screening.  
iii) Applications of citric acid.  
iv) Define crude and synthetic media with example.  
v) Give any two examples of anaerobic fermentations.  
vi) Define fermentation.  
vii) Flocculation.  
viii) Scale up of fermentation.

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3. A) Answer **any two** of the following : **10**
- i) Write an account on primary screening.
  - ii) Raw materials used in fermentation.
  - iii) Microbial growth kinetics in continuous culture.
- B) Explain submerged and solid state fermentations. **4**
4. Answer **any two** of the following : **14**
- i) Explain filtration and centrifugation used for purification of fermented products.
  - ii) Application of computer in fermentation technology.
  - iii) Explain in detail production of Vitamin B12.
5. Answer **any two** of the following : **14**
- i) Explain basic functions of a fermenter and components of typical fermentor.
  - ii) Explain strain improvement and its various methods.
  - iii) Biological assays.
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**B.Sc. – III (Semester – VI) (Biotechnology) (New CGPA) Examination, 2017  
FOOD AND DAIRY TECHNOLOGY**

Day and Date : Monday, 6-11-2017

Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

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

1. Choose the correct alternative and rewrite the sentences again : **14**
- i) Leuconostoc and Pediococcus are the brine loving microbes observed in  
a) bread                      b) vinegar                      c) pickle                      d) beer
  - ii) Improperly processed canned foods are dangerous due to  
a) mycosis                      b) botulism                      c) brucellosis                      d) salmonellosis
  - iii) Phosphatase test is used for  
a) spoilage of milk  
b) preservation of milk  
c) counting of microbes in milk  
d) determination of efficiency of pasteurization
  - iv) In the cheese production casein is coagulated using  
a) milk                      b) protease                      c) rennet                      d) whey
  - v) \_\_\_\_\_ nutrient medium is used for MPN test.  
a) Citrate broth                      b) MacConkey's broth  
c) Nutrient broth                      d) Gelatin broth
  - vi) DNA/RNA hybridization methods are used to detect the presence of \_\_\_\_\_ in food.  
a) flavors                      b) chemicals                      c) toxins                      d) microbes
  - vii)  $^{60}\text{Co}$  and  $^{137}\text{Cs}$  are ionizing radiations used for food preservation emits \_\_\_\_\_ rays.  
a)  $\gamma$                       b)  $\alpha$                       c)  $\beta$                       d) x

P.T.O.



- viii) Radiation of UV at \_\_\_\_\_ nm wavelength are most germicidal.  
a) 250                      b) 260                      c) 280                      d) 300
- ix) The major carrier of Salmonellosis is associated with  
a) Meat and eggs  
b) Sugar and sugar products  
c) Cereal and cereal products  
d) Fish and sea products
- x) \_\_\_\_\_ is not the intrinsic parameter of food responsible for microbial growth.  
a) pH    b) Moisture content  
c) Nutrient content    d) Temperature of storage
- xi) As per MBRT test decolourization after 8 hours indicates that milk has \_\_\_\_\_ quality.  
a) better                      b) good                      c) excellent                      d) poor
- xii) Failure to meet a required critical limit for a Critical Control Point is called  
a) Corrective action    b) Validation  
c) Verification    d) Deviation
- xiii) \_\_\_\_\_ is used as leavening agent in bread production.  
a) Mold                      b) Yeast                      c) Bacteria                      d) Protozoa
- xiv) In quality control microbial examination of finished product as well as ingredients, products in process, equipments, environment and personnel is known as  
a) control at source    b) hazard  
c) criteria    d) quality

2. Define and explain **any seven** of the given below :

14

- i) Asepsis
- ii) Nonperishable food
- iii) Risk
- iv) Food safety
- v) Milk
- vi) Dairy
- vii) Record keeping
- viii) Indicator organism.

Set P



3. A) Answer **any two** of the following : **10**
- i) Explain genetic and immunological methods used for determination of food spoilage caused by toxins and microbes.
  - ii) Explain microbial spoilage of cereals and cereal products.
  - iii) Define pasteurization and explain methods of pasteurization.
- B) Define and explain intrinsic parameters of food considered in preservation. **4**
4. Answer **any two** of the following : **14**
- i) Explain MBRT, Resazurin and Phosphatase test in detail.
  - ii) Explain the production, spoilage, preservation and nutritional value of Yoghurt.
  - iii) Explain the general methods of food preservation.
5. Answer **any two** of the following : **14**
- i) Explain Hazard Analysis and Critical Control Points (HACCP) system in detail.
  - ii) Explain the production, soilage, preservation and nutritional value of Vinegar.
  - iii) Explain microbial spoilage of sugar and sugar products.
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**B.Sc. – III (Semester – VI) (Biotechnology) Examination, 2017**  
**ENGLISH (Compulsory) (Old)**  
**Breakthrough**

Day and Date : Tuesday, 31-10-2017

Max. Marks : 50

Time : 10.30 a.m. to 12.30 p.m.

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

1. A) Choose the correct alternative :

6

- 1) Which of the following statement is not true ?
  - a) Bringing water from the town pump had always been hateful work in Tom's eyes
  - b) Tom wanted to bring water from the town pump instead of whitewashing the fence
  - c) Tom was ready to give Jim a mighty gay marvel in exchange of whitewashing the fence
  - d) Jim accepted the privilege of whitewashing the fence when Tom offered him a bully taw
- 2) The necklace that Loiseles had lost cost
  - a) Five hundred francs
  - b) Forty thousand francs
  - c) Thirtyfour thousand francs
  - d) Thirtysix thousand francs
- 3) Pyramus saw in the sand the footsteps of the
  - a) Lion
  - b) Tiger
  - c) Wolf
  - d) Fox
- 4) Which of the following instruments is not played by the musicians *In the Bazaars of Hyderabad* ?
  - a) Sitar
  - b) Sarangi
  - c) Drum
  - d) Flute
- 5) Phillis Wheatley asks \_\_\_\_\_ not to sink into despair.
  - a) Virtue
  - b) God
  - c) Soul
  - d) Angels
- 6) The story of Pyramus and Thisbe has been burlesqued in
  - a) Ovid's Metamorphoses
  - b) Shakespeare's Mid-Summer Night's Dream
  - c) Mickle's translation of the "Lusiad"
  - d) Sylph's Ball

P.T.O.



- B) Do as directed : 4
- 1) Somebody left the key on the table. (Add a question tag)
  - 2) These keys are yours. (Frame a Wh-question to get the underlined part as an answer)
  - 3) You are requested to give me a glass of water. (Make it imperative)
  - 4) You put off the lights and I will scream. (Change into a complex sentence)
2. Answer **any five** of the following questions in brief : 10
- 1) What is the great law of human action that Tom discovered ?
  - 2) What moral lesson does the story *The Necklace* teach ?
  - 3) What did Mathilde do to pay the debt ?
  - 4) What action do the parents of Thisbe take after her death ?
  - 5) What is the myth about red mulberries ?
  - 6) What, according to Mark Twain, is the difference between the work and play ?
3. A) Answer **any two** of the following questions : 6
- 1) What is the theme of the poem *On Virtue* ?
  - 2) Comment on the title of the poem *In the Bazaars of Hyderabad*.
  - 3) What poetic devices have been used in the poem *On Virtue* ?
- B) Answer **any two** of the following question : 4
- 1) You have passed NIIT examination after XII Science and you get admission to MBBS in Bihar. What would you do to adapt yourself to the new situation ?
  - 2) Make a list of five ways in which you usually waste your time. What will you do to manage your time better ?
  - 3) You are a clever student of B.Sc. III and you expect distinction in the university examination but you fail in it. You are in great stress. What will you do in such a situation ?
4. Answer **any one** of the following questions : 10
- A) Write in detail the description of your favourite political leader. Remember to convey the character, thoughts and his vision.
- OR
- B) You were driving on a lonely highway at night. Describe what happened when you were stopped by three men on the way.



5. Read the following passage and summarise it.

10

Accounting is inseparable from the person serving as an accountant. It is said that poets are born, not made. The same may be true of any professional. The implication is that a person will have some inborn qualities which make for success in the chosen field of activity. It is not just a question of getting an academic degree in Accountancy and membership of a recognised professional accounting body.

A progressive accountant must have certain qualities of mind and heart, not generally required for service in any other profession, if he is to do justice to himself, to the profession and to the community at large. A reasonable aptitude for arithmetic if not mathematics, an analytical and a critical attitude, a capacity for sound judgement, a sound common sense, a proper understanding of human relations and practical business, a certain amount of tact in handling situations and an ability to express clearly and convincingly what he honestly feels may be listed as some of the qualities that go to make up the personality of an accountant. Any one of these qualities by itself will not make for success, but a combination of all of them in a requisite measure will be absolutely essential in the case of those cut out for this profession.

An accountant need not be an expert at mathematics because Accountancy is not an exact science, although it is exacting. The mere ability to add two and two can never make a person an accountant. What is meant is that an accountant who always dabbles in figures must be able to deal with figures meaningfully, analyse them, view them in proper perspective, and interpret them critically before reporting on the results. He is essentially a specialist and an expert in planning, analysing, interpreting, verifying and reporting on economic and non-economic data. As accounting is a man-made science, it is mostly conventional and there is no finality or certainty about it although it may be and is highly desirable. If a person has certain basic endowments, there seems to be no reason why he should not and cannot be a success in the profession.

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**B.Sc. (Biotechnology) (Part – III) (Semester – VI) (Old) Examination, 2017**  
**GENETIC ENGINEERING : TOOLS AND TECHNIQUES – I**

Day and Date : Wednesday, 1-11-2017  
Time : 10.30 a.m. to 12.30 p.m.

Max. Marks : 50

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

1. Rewrite the following sentences by using the correct answers from given alternatives :

10

- 1) Type – II restriction endonucleases are most commonly used in \_\_\_\_\_ technique.  
a) PCR  
b) RFLP  
c) Western blotting  
d) Ligation
- 2) \_\_\_\_\_ is a self replicating entity used as a vector in gene transfer technique.  
a) Plasmid      b) Virus      c) Bacteriophage      d) Probe
- 3) Insert size of 400-450 Kb can be incorporated in a \_\_\_\_\_.  
a) Cosmid      b) Virus      c) Plasmid      d) YAC
- 4) Maxam Gilbert method is used for sequencing of \_\_\_\_\_.  
a) RNA      b) DNA      c) Protein      d) Other bimolecules
- 5) C-DNA library is prepared from \_\_\_\_\_.  
a) r-RNA      b) t-RNA      c) m-RNA      d) Sn-RNA
- 6) In genetic engineering a probe is used for \_\_\_\_\_.  
a) Cloning      b) Screening      c) Cleaving      d) Recombinant DNA
- 7) Nitrocellulose membrane is mostly used in \_\_\_\_\_ techniques.  
a) Chromatographic      b) Paper electrophoresis  
c) Blotting      d) Reporter gene assay

P.T.O.



- 8) \_\_\_\_\_ is a technique in which Mini satellite sequences are used for analysis.
- a) DNA fingerprinting                      b) Dot blot  
c) Autoradiography                         d) DNA Hybridization
- 9) Taq DNA polymerase is a \_\_\_\_\_ enzyme used in PCR.
- a) Thermolabile                                b) Thermostable  
c) Halophilic                                    d) Halophobic
- 10) The technique of using electric current to allow entry of DNA into a cell is called \_\_\_\_\_
- a) Electrophoresis                            b) Electroporation  
c) Microinjection                            d) Macroinjection

2. Answer **any five** of the following : **10**
- i) Discuss the role of Reverse transcriptase enzyme.  
ii) Give the significance of transfection technique.  
iii) Write a note on the properties of an ideal vector.  
iv) Explain chromosome walking.  
v) Describe the technique of Particle bombardment.  
vi) Explain the principle of Autoradiography.
3. A) Answer **any two** of the following : **6**
- i) Explain the technique of electrophoresis and add a note on its applications.  
ii) Explain insertional inactivation.  
iii) Discuss the technique of Agrobacterium mediated gene transfer technique.
- B) Write a note on Maxam and Gilbert's method of DNA sequencing. **4**
4. Answer **any two** of the following : **10**
- i) Write a note on scope of genetic engineering.  
ii) Describe in detail different types of PCR.  
iii) Explain the role of Shuttle vectors.
5. Answer **any two** of the following : **10**
- i) Discuss the role of nucleic acid modifying enzymes.  
ii) Describe the various methods of Blotting.  
iii) What is cloning ? Explain cloning from genomic DNA.





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**B.Sc. III (Biotechnology) (Semester – VI) (Old) Examination, 2017**  
**GENETIC ENGINEERING : APPLICATIONS – II**

Day and Date : Thursday, 2-11-2017  
Time : 10.30 a.m. to 12.30 p.m.

Max. Marks : 50

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

1. Rewrite the following sentences by choosing correct alternatives. 10

- 1) Lignin is made up of \_\_\_\_\_ subunits with no chains of regular repeating units.  
a) Phenylpropane    b) Butane    c) Propane    d) Phenol
- 2) Microbes represents \_\_\_\_\_ Biomass of our planet.  
a) 25 %    b) 50 %    c) 20 %    d) 10 %
- 3) Interferon  $\alpha$  and  $\beta$  are synthesized in cells that have been exposed  
a) Bacteria    b) Fungus    c) Viruses    d) Protozoans
- 4) \_\_\_\_\_ began the work in direction of protein engineering in early 1954.  
a) Morris Gayle    b) Carrel    c) Zernik    d) Max Perutz
- 5) The composition of \_\_\_\_\_ oligonucleotide includes a single mixed oligonucleotides with ribonucleotides and deoxyribonucleotides.  
a) Chimeric    b) Antisense    c) Fused    d) Antagonist
- 6) The addition of \_\_\_\_\_ to animal cell reduces the expression of the gene from which double stranded RNA sequence is derived.  
a) Ds DNA    b) Ds RNA    c) Ss DNA    d) Ss RNA
- 7) Subunit vaccine for cholera is prepared by \_\_\_\_\_ epitope.  
a) Cholera toxin C subunit    b) Cholera toxin A subunit  
c) Cholera toxin B subunit    d) Cholera toxin D subunit

P.T.O.



8) Genetically engineered *X. Campestris* was grown on whey due to insertion of \_\_\_\_\_ gene.

- a) *Bacillus lac ZY*
- b) *E. coli lac ZY*
- c) *Fungus lac ZY*
- d) *Pseudomonas lac ZY*

9) Crystal shape of CRY I A (a) is

- a) Bipyramidal
- b) Cuboidal
- c) Flat
- d) Irregular

10) \_\_\_\_\_ Portion is 3000 times sweeter than sucrose.

- a) Morphine
- b) Monellin
- c) Casein
- d) BSA

2. Answer the following (**any five**) : **10**

- 1) Give brief account on plant as edible vaccine.
- 2) Explain antisense RNA.
- 3) Explain in brief peptide vaccines.
- 4) Explain attenuated vaccine.
- 5) Write short note on chimeric RNA DNA molecule.
- 6) Write a note on Interfering RNA.

3. A) Answer the following (**any two**) : **6**

- 1) Explain cloning livestock by nuclear transfer.
- 2) How will you increase enzyme activity explain with example.
- 3) Write a note on synthesis of human growth hormone.

B) Explain synthesis of human interferon. **4**

4. Answer the following (**any two**) : **10**

- 1) Give details of utilization of cellulose as a component of lignocellulases.
- 2) Describe in detail subunit vaccines against FMD.
- 3) Discuss vector vaccines directed against viruses.

5. Answer the following (**any two**) : **10**

- 1) Discuss in detail development of herbicide resistant plants.
- 2) Describe Microbial degradation of xenobiotics.
- 3) Give details of transgenic mice.

\_\_\_\_\_



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Set **P**

**B.Sc. – III (Biotechnology) (Semester – VI) (Old) Examination, 2017**  
**MICROBIAL BIOTECHNOLOGY**  
**Fermentation Technology – I**

Day and Date : Friday, 3-11-2017

Max. Marks : 50

Time : 10.30 a.m. to 12.30 p.m.

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

1. Rewrite the following sentences by choosing correct alternative given below : **10**
- \_\_\_\_\_ technique is used for selection of auxotrophic mutants.  
a) Alcohol                      b) Acid                      c) Penicillin                      d) None of these
  - Corn steep liquor is example of \_\_\_\_\_ media.  
a) Synthetic    b) Crude  
c) Semisynthetic    d) None of these
  - Aeration in bioreactor is provided by  
a) Impeller                      b) Sparger                      c) Baffles                      d) All of these
  - Commercial production of ethanol is done by using  
a) Penicillium notatum    b) E Coli  
c) Saccharomyces cerevisiae    d) Aspergillus niger
  - The sterilization of air in industries is widely carried out by using  
a) U. V. Rays                      b) X-rays                      c) Filtration                      d) None of these
  - Microorganisms produces primary metabolites in \_\_\_\_\_ phase of growth.  
a) Lag    b) Exponential  
c) Stationary    d) Death
  - Disc diffusion assay is example of \_\_\_\_\_ assay.  
a) Physical-chemical    b) Biological  
c) Enzymatic    d) None of these
  - Pilot plant fermentor having \_\_\_\_\_ liters capacity.  
a) 1 - 2    b) 100 - 500                      c) 1,00,000                      d) None of these

P.T.O.



- ix) \_\_\_\_\_ is example of organic antifoam agents.  
a) Lard oil    b) Corn oil  
c) Cotton seed oil                                d) All of these
- x) Industrial production of ethanol is example of \_\_\_\_\_ fermentation.  
a) Aerobic                    b) Anaerobic    c) Submerged    d) Surface

2. Answer **any five** of the following : **10**
- i) Define crude and synthetic media.
  - ii) Give examples of biological assay.
  - iii) Give any two examples of surface fermentation.
  - iv) Give fermentation medium used for production of Penicillin.
  - v) Define precipitation and solvent extraction.
  - vi) Give difference between batch and continuous fermentation.
3. A) Answer **any two** of the following : **6**
- i) Characteristics of an ideal fermentation medium.
  - ii) Give different methods of preservation and maintenance industrial important strains.
  - iii) Fermentation economics.
- B) Explain biological assays. **4**
4. Answer **any two** of the following : **10**
- i) Explain microbial growth kinetics in batch culture.
  - ii) Write an account on different methods of filtration used for purification of fermented broth.
  - iii) Explain primary screening.
5. Answer **any two** of the following : **10**
- i) Explain application of computer in fermentation technology.
  - ii) Explain submerged and surface fermentation.
  - iii) Give an account on citric acid production.
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Set **P**

**B.Sc. – III (Semester – VI) (Old) Examination, 2017**  
**BIOTECHNOLOGY**  
**Microbial Biotechnology**  
**Food and Dairy Technology – II**

Day and Date : Monday, 6-11-2017  
Time : 10.30 a.m. to 12.30 p.m.

Max. Marks : 50

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

1. Choose the correct alternative and rewrite the sentences again : **10**
- i) *Acetobacter aceti* oxidizes the alcohol to produce \_\_\_\_\_  
a) Acetic acid    b) Citric acid    c) Benzoic acid    d) Propionic acid
  - ii) Drying is used to reduce \_\_\_\_\_  
a) pH    b) moisture    c) nutrients    d) carbohydrates
  - iii) \_\_\_\_\_ is the milk protein.  
a) Cytokine    b) Casein    c) Lectin    d) Hemoglobin
  - iv) \_\_\_\_\_ is not the extrinsic parameter of food responsible for microbial growth.  
a) pH  
b) Temperature of storage  
c) Relative humidity of environment  
d) Presence of gases in environment
  - v) \_\_\_\_\_ is microbial indicator of fecal pollution.  
a) *P. aeruginosa*    b) *S. typhi*    c) *E. Coli*    d) *B. subtilis*
  - vi) Quality of milk determined using \_\_\_\_\_  
a) MBRT test    b) Resazurin test  
c) Both of these    d) None of these
  - vii) Failure to meet required critical limit for a Critical Control Point is called \_\_\_\_\_  
a) Deviation    b) Corrective action  
c) Verification    d) Validation

P.T.O.



- viii) \_\_\_\_\_ is the procedure followed when a deviation occurs in critical limit from CCP.
- a) Deviation
  - b) Hazard
  - c) Corrective action
  - d) Validation
- ix) In standard plate count of pasteurized milk plates are incubated at \_\_\_\_\_ temp.
- a) Low
  - b) Moderate
  - c) Higher
  - d) All of these
- x) \_\_\_\_\_ radiations are ionizing type of radiations used for preservation of food after packaging also.
- a) Alpha
  - b) Beta
  - c) Gamma
  - d) UV

2. Define and explain **any five** of the given below : **10**
- i) Toxins
  - ii) Standard plate count
  - iii) Quality control
  - iv) Milk
  - v) Perishable food
  - vi) Radiation.
3. A) Answer **any two** of the following : **6**
- i) Explain most probable number methodology for determination of fecal load.
  - ii) Explain on microbial spoilage of vegetables and fruits.
  - iii) Define pasteurization and explain methods of pasteurization.
- B) Define and explain extrinsic parameters of food considered in preservation. **4**
4. Answer **any two** of the following : **10**
- i) Explain the production, spoilage, preservation and nutritional value of Sauerkraut.
  - ii) Explain Hazard Analysis and Critical Control Points (HACCP) system in detail.
  - iii) Explain microbial spoilage of fish and sea products.
5. Answer **any two** of the following : **10**
- i) Explain the production, spoilage, preservation and nutritional value of pickles.
  - ii) Write an essay on methods used for food preservation.
  - iii) Explain genetic and immunological methods used for determination of food spoilage caused by toxins and microbes.



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**B.Sc. I (Semester – I) (Biotechnology) Examination, 2017  
(New CBCS)  
ENGLISH COMPULSORY  
Text : Golden Petals**

Day and Date : Tuesday, 31-10-2017  
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

**N.B. :** 1) **All questions are compulsory.**  
2) **Figures indicate to right carry full marks.**

1. Rewrite the following sentences choosing the correct alternative : 14

- 1) \_\_\_\_\_ gave a notice of leaving the keystone company as he was not interested in doing films with the company.  
a) Ford staring      b) Ford starling      c) Ford sterling      d) Eward Ford
- 2) Charlie was signed at \_\_\_\_\_ pounds per week by the company.  
a) 160                      b) 170                      c) 150                      d) 175
- 3) Shanti Tigga was recruited in the year \_\_\_\_\_ on grounds of compassion after the death of her husband.  
a) 2004                      b) 2005                      c) 2003                      d) 2004
- 4) Nachiketa waited at the gates of god of death Yama without any food or water for \_\_\_\_\_ days.  
a) five                      b) two                      c) four                      d) three
- 5) The poem-success is Counted Sweetest was first published in the year  
a) 1874                      b) 1864                      c) 1894                      d) 1834
- 6) I find no \_\_\_\_\_ and all my war is done.  
a) piece                      b) room                      c) peace                      d) place
- 7) The god of death granted \_\_\_\_\_ boons to Nachiketa after becoming impressed by him.  
a) two                      b) five                      c) three                      d) six
- 8) Choose the correct form of noun.  
What is the \_\_\_\_\_ ?  
a) news                      b) nues                      c) neus                      d) newz

P.T.O.



9) Choose the correct article.

Look there is \_\_\_\_\_ apple in the bag of Sarika.

- a) the                      b) a                      c) an                      d) no article

10) Choose the correct collective noun.

There was a meeting of the \_\_\_\_\_ of Directors.

- a) Bored                      b) Board  
c) Boared                      d) None of the above

11) Choose the correct form of the verb.

Samir \_\_\_\_\_ stories on every sunday.

- a) reading                      b) reds                      c) reads                      d) reeds

12) Choose the correct form of the pronoun.

Nobody but \_\_\_\_\_ was present in the class whole day listening the lectures.

- a) he                      b) him                      c) his                      d) one

13) Choose the correct mood.

When the sun set we returned home.

- a) Imperative Mood                      b) Subjunctive Mood  
c) Happy Mood                      d) Indicative Mood

14) Choose the correct homophone.

This is very costly \_\_\_\_\_ that – I purchased in London last month.

- a) sent                      b) scent                      c) cent                      d) ksent

2. Answer the following questions in **2-3** sentences (**any seven**).

**14**

- 1) What was the review of Charlie Chaplin's first film by a New York writer ?
- 2) Describe the costume of Charlie Chaplin in the Film-Making a Living.
- 3) Describe the achievements of Shanti Tigga in her training.
- 4) What was the reaction of adivasi groups after the death of Shanti Tigga ?
- 5) Describe the condition of the film makers of Charlie Chaplin's first film.
- 6) Describe Vajasrawas love for Nachiketa.
- 7) What was Nachiketa's second wish ?
- 8) Why was Yama pleased with Nachiketa ?





3. A) Answer in about **50** words **each (any two)**. **8**
- 1) What is communication and why do we communicate ?
  - 2) How do you communicate with a principal to know about the admission process in his college ?
  - 3) Write in detail what is communication barriers ?
- B) Answer the following questions (**any two**). **6**
- 1) Why does the poet not find any peace in the poem 'I Find No Peace' ?
  - 2) What is the theme of the poem 'Success is Counted Sweetest' ?
  - 3) What are the conflicting emotions of the poet in the poem – 'I Find No Peace' ?
4. Answer **any one** of the following. **14**
- 1) Describe what is communication process stating importance of its parts and stages.
  - 2) Why the Language skill and vocabulary are necessary for effective communicating our thoughts to other ? Explain in detail.
5. Answer the following question. **14**
- What are the advantages of two way communication ? Write in detail.
-