



Seat No.	
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**B.Sc. – I Biotechnology (Semester – I) Examination, 2014**  
**CELL PHYSIOLOGY – I (Old)**

Day and Date : Thursday, 5-6-2014  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Multiple choice questions.

10

- 1) \_\_\_\_\_ is absent in animal cells.  
a) Nucleus      b) Ribosome      c) Cell Wall      d) Lysosome
- 2) \_\_\_\_\_ is important component of bacterial cell wall.  
a) Peptidoglycan      b) Cellulose  
c) Hemicellulose      d) Pectin
- 3) Genetic materials in bacterial cell is called \_\_\_\_\_.  
a) Nucleus      b) Nucleoid      c) RNA      d) cDNA
- 4) \_\_\_\_\_ is known as protein factories of the cell.  
a) Lysosome      b) Nucleus  
c) Mitochondria      d) Ribosome
- 5) \_\_\_\_\_ is monomer of microfilaments.  
a) Tubulins      b) G-actin      c) F-actin      d) Myosin
- 6) Keratin filaments is a type of \_\_\_\_\_.  
a) Actin filament      b) Intermediate filament  
c) Microfilaments      d) Microtubules
- 7) \_\_\_\_\_ is correct sequence of cell cycle.  
a)  $G_1 - S - G_2 - M$       b)  $G_1 - G_2 - M - S$   
c)  $S - M - G_2 - G_1$       d)  $S - G_2 - G_1 - M$
- 8) One of the following is initiator tRNA molecule  
a)  $tRNA^{fmet}$       b)  $tRNA^{leu}$       c)  $tRNA^{val}$       d)  $tRNA^{isoleu}$



9) During translation \_\_\_\_\_ is act as energy molecule.

- a) CTP                      b) GTP                      c) TTP                      d) ADP

10) \_\_\_\_\_ proteins is associated with DNA during chromosome condensation.

- a) Albumin                      b) Keratin                      c) Histone                      d) Nucleoproteins

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

**10**

- i) Mycoplasm's.
- ii) Functions of lysosomes.
- iii) Define cytoskeleton.
- iv) Define cell growth.
- v) What is meant by cell synchrony ?
- vi) Define heterochromatin.

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

**6**

- i) Describe structure of Prokaryotic cell.
- ii) Describe structure of Eukaryotic cell wall.
- iii) Describe in detail structure and functions of intermediate filaments.

B) Write a note on mechanism of protein synthesis.

**4**

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

**10**

- i) Explain structure of plasma membrane.
- ii) Describe in detail structure of microtubules.
- iii) Write an detailed account on chromosome.

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

**10**

- i) Explain process of meiosis and add note on its functions.
  - ii) Write a note on genetic code.
  - iii) Describe in detail polytene and lampbrush chromosomes.
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**SLR-D – 10**

<b>Seat No.</b>	
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**B.Sc. – I (Semester – II) (Biotechnology) Examination, 2014  
ENGLISH COMPULSORY (Old)  
Realms of Gold**

Day and Date : Thursday, 8-5-2014

Total Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

1. Fill in the blanks by choosing the correct alternative given below them : **10**

- i) Vivekananda presented Hinduism as
- a) the only true religion                      b) the best of all religions  
c) the mother of all religions              d) the only good religion
- ii) \_\_\_\_\_ is the planet nearest to the Sun.
- a) Earth    b) Venus  
c) Mercury                                         d) Mars
- iii) The scientific point of view must come out of the
- a) Religion                                         b) Library  
c) Laboratory                                     d) Scriptures
- iv) Ballad of the landlord is written by
- a) Langston Hughes                            b) Oliver Goldsmith  
c) A. K. Ramanujan                            d) Miller Goldsmith
- v) The Champak tree is as old as
- a) uncle     b) brother  
c) sister     d) mother
- vi) The Parliament of religion was opened on
- a) 12 Sept. 1893                                 b) 11 June 1893  
c) 11 July 1893                                 d) 11 Sept. 1893
- vii) Rashmi \_\_\_\_\_ history since morning.
- a) is studying                                     b) studies  
c) studied                                         d) will study

**P.T.O.**

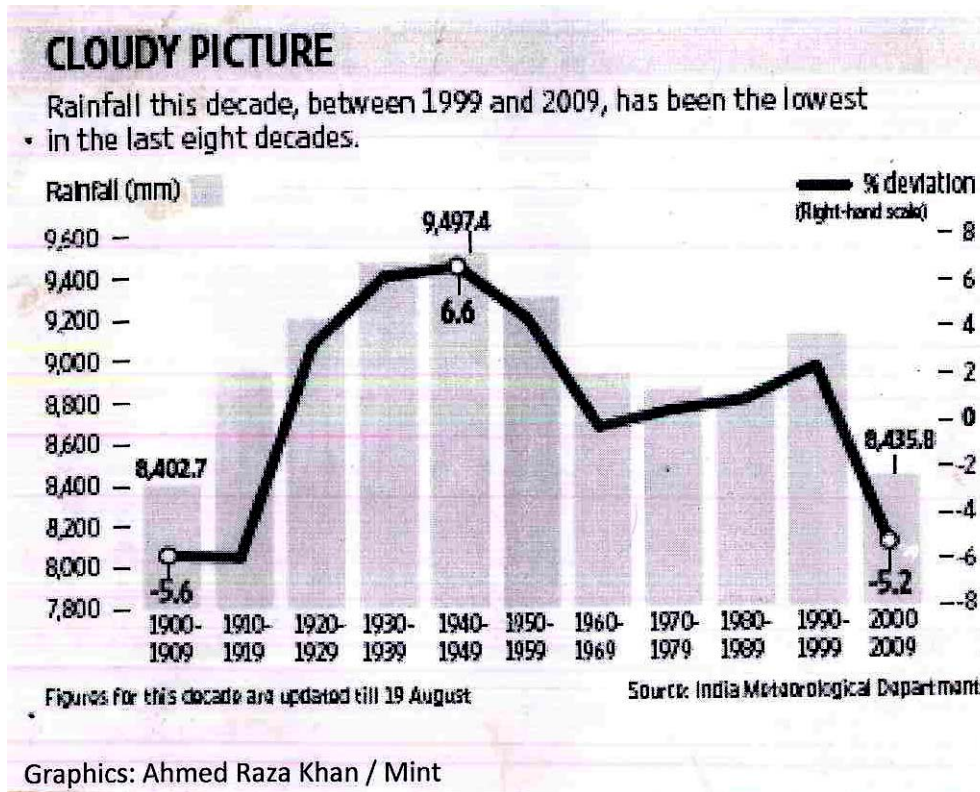




4. Answer **any one** of the following :

10

1) Read the following graph and transfer the information into paragraph :



Graphics : Ahmed Raza Khan/Mint.

2) Read the following paragraph carefully and make a note on it.

Animals living in modern zoos enjoy several advantages over animals in the wild; however, they must so suffer some disadvantages. One advantage of living in the zoo is that the animals are separated from their natural predators; they are protected and can, therefore, live without risk of being attacked. Another advantage is that they are regularly fed a special, well-balanced diet; thus, they do not have to hunt for food or suffer times when food is hard to find. On the other hand, zoo animals face several disadvantages. The most important disadvantage is that since they do not have to hunt for food or face their enemies, some animals became bored, discontented or even nervous. Another disadvantage is that zoo visitors can endanger their lives. Some animals can pick up airborne diseases from humans.

5. Draft out an advertisement of a newly launched mobile phone.

10





Seat No.	
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**B.Sc. (Part – I) (Sem. – II) Examination, 2014**  
**BIOTECHNOLOGY (Old)**  
**Computers – II**

Day and Date : Tuesday, 20-5-2014

Total Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the following sentences by using correct answer from given alternatives : **10**

i) \_\_\_\_\_ section of email indicates that the receivers of the mail are unable to see the list of other addresses to whom the mail has been sent.

- a) CC
- b) BCC
- c) To
- d) Attachment

ii) The study of complete set of DNA/RNA in an organism is called as

- a) Genome
- b) Genomics
- c) Genotype
- d) Gen bank

iii) The protocol that web servers and clients use to communicate with each other is called

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

iv) National Centre for Biotechnology Information is division of

- a) National Library of Medicine
- b) National Institute of Health
- c) European Bioinformatics Institute
- d) DNA Data Bank of Japan

v) The largest network is

- a) LAN
- b) MAN
- c) Internet
- d) Use net



- vi) Phylogenetic analysis is also known as
- a) Phylum analysis
  - b) Physico-genetic study
  - c) Molecular taxonomy
  - d) None of these
- vii) ISP stands for
- a) Internet System Provider
  - b) Internet Service Preparation
  - c) Internet Service Provider
  - d) None of these
- viii) Pub Med database of NCBI contains
- a) Biomedical Literature
  - b) Complete Genome Assembler
  - c) Organisms in Gen Bank
  - d) Conserved domains
- ix) Token passing system can be used in \_\_\_\_\_ topology.
- a) Star
  - b) Bus
  - c) Ring
  - d) Tree
- x) \_\_\_\_\_ ethernet standards uses thicknet cable.
- a) 10 Base 5
  - b) 10 Base 2
  - c) 10 Base T
  - d) 10 Base F

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

**10**

- i) Explain the advantages of network.
- ii) Give an account of CDNA.
- iii) Write a note on “Microwave Communication”.
- iv) Write a note on “Gene Sequencing tag”.
- v) Explain switches.
- vi) Give role of Bioinformatics in analysis of proteins.
- vii) Explain nodes.





3. A) Answer **any two** of the following : 6
- i) Explain star topology.
  - ii) Write a note on Satellite Communication.
  - iii) Explain “Modem”.
- B) Write a note on DNA sequences and nomenclature. 4
4. Answer **any two** of the following : 10
- i) What is computer network ? Explain MAN.
  - ii) Write an account on tools used for prediction of function of unknown genes.
  - iii) Explain Ethernet Network Architecture.
5. Answer **any two** of the following : 10
- i) How CDNA is prepared ? Explain.
  - ii) Explain the types of Hybrid topology.
  - iii) Give application of Bioinformatics.
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<b>Seat No.</b>	
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**B.Sc. – II (Sem. – III) Examination, 2014  
BIOTECHNOLOGY  
Immunology – I, (Cells and Organs of Immunity)**

Day and Date : Tuesday, 27-5-2014

Total Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

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

1. Rewrite the following sentences by selecting the correct answer from the alternatives. **10**
- I) The complement fragment \_\_\_\_\_ acts as anaphylatoxins.
- a)  $C_{2b}$  b)  $C_8$   
c)  $C_{3b}$  d)  $C_{3a}$
- II) The example of (double diffusion in two dimensions) Ouchterlony technique is \_\_\_\_\_ test.
- a) Ascolis thermoprecipitin b) Elek  
c) VDRL d) Kahn
- III) The same antigens that occur in different biological species is known as
- a) heterophile antigen b) Isoantigen  
c) Organ specific antigen d) Autoantigen
- IV) The primary lymphoid organ in avians is
- a) Bursa of fabricious b) Bone marrow  
c) Lymphnode d) Spleen
- V) J chain is present in \_\_\_\_\_ class of immunoglobulins.
- a) IgD b) IgG  
c)  $IgG_2$  d) IgM



VI) Antigen in antigen antibody reaction is

- a) Monovalent
- b) Multivalent
- c) Bivalent
- d) Trivalent

VII) Bacteremia is associated with deficiencies of \_\_\_\_\_ complement components.

- a) C<sub>1</sub>
- b) C<sub>2</sub>
- c) C<sub>5</sub> to C<sub>8</sub>
- d) C<sub>9</sub>

VIII) \_\_\_\_\_ antibodies can cross the placenta.

- a) IgG
- b) IgM
- c) IgD
- d) IgE

IX) MHC Class I molecules consists of

- a) alpha chain only
- b) alpha chain and  $\beta_2$  microglobulin
- c) an alpha and beta chain
- d)  $\beta$  eta chain only

X) Antiviral activity is associated with \_\_\_\_\_ cytokine mainly.

- a) IL – 2
- b) IL – 5
- c) IFN –  $\alpha$
- d) LIF

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

**10**

- 1) Which are different interferons. Mention their function.
- 2) What do you mean by abzymes.
- 3) Mention the applications of precipitation reaction.
- 4) Which are the activators of alternate C activation pathway ?
- 5) What are haptens ?
- 6) What are natural killer cells ?



3. A) Answer the following questions (**any 2**) : **6**
- 1) Write the principle of complement fixation test ? Give its application.
  - 2) Write a note on antigenic determinants.
  - 3) What is the role of mucosa associated lymphoid tissue ?
- B) Describe the different types of antigens. **4**
4. Write short notes on (**any 2**) : **10**
- 1) IgG
  - 2) Cytokines
  - 3) Monoclonal antibodies.
5. Write short notes on (**any 2**) : **10**
- 1) Phagocytic cells
  - 2) Complement fixation test
  - 3) Complement deficiencies.
-







- 7) Agarose gels are \_\_\_\_\_ in nature.  
a) Hydrophobic    b) Hydrophilic    c) Isotonic    d) Hypertonic
- 8) \_\_\_\_\_ technique is based on creation of pH gradients.  
a) Isoelectric focussing    b) SDS-PAGE  
c) Paper electrophoresis    d) Native electrophoresis
- 9) A scientist Tiselius discovered the technique of \_\_\_\_\_  
a) Column chromatography    b) Electrophoresis  
c) Ultracentrifugation    d) Density gradient centrifugation
- 10) In affinity chromatography the ligand binding to the support and the antibody to be purified is of \_\_\_\_\_ type.  
a) Reversible    b) Irreversible    c) Permanent    d) Sensible

2. Answer **any five** of the following : 10

- 1) Write use of SDS in electrophoresis.
- 2) State the principle of paper chromatography.
- 3) Give any two uses of northern blotting technique.
- 4) What is the use of stacker gel in gel electrophoresis ?
- 5) Write the applications of starch gel electrophoresis.
- 6) Give any two applications of mass spectroscopy.

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

- 1) State the principle of affinity chromatography.
- 2) Write a note on Bicinchoninic acid (BCA) assay.
- 3) Give any three applications of two dimensional electrophoresis.

B) Discuss the method of carboxyterminal sequencing of proteins. 4

4. Answer **any two** of the following : 10

- 1) How proteins are determined by SDS-gel electrophoresis ?
- 2) Write an account of mass spectroscopy of peptides and proteins.
- 3) Discuss the process-southern blotting.

5. Answer **any two** of the following : 10

- 1) Explain the technique of ion-exchange chromatography.
  - 2) Discuss different stains used to stain the gel.
  - 3) Write an account of working of HPLC.
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SLR-D – 30

Seat No.	
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**B.Sc. – II (Semester – IV) Biotechnology Examination, 2014**  
**IMMUNOLOGY – II**  
**Humoral and Cell Mediated Immunity**

Day and Date : Wednesday, 30-4-2014

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

- Instructions :** 1) **All questions are compulsory.**  
2) Draw **neat** labelled diagram **wherever** necessary.

1. Multiple choice questions :

10

- 1) Vaccines consists avirulent bacterial cells or viral particles are known as
  - a) killed vaccines
  - b) attenuated vaccines
  - c) subunit vaccines
  - d) recombinant vaccines
- 2) \_\_\_\_\_ is a tissue transferred between genetically different members of the same species.
  - a) Xenograft
  - b) Autograft
  - c) Allograft
  - d) Isograft
- 3) A patient with \_\_\_\_\_ disease produces autoantibodies to the receptor for TSH.
  - a) Insulinitis
  - b) Grave's
  - c) Pernecious anemia
  - d) Systemic erythromatosus
- 4) T helper cells ( $T_H$ ) can be distinguished by the presence of membrane glycoprotein
  - a)  $CD_4$
  - b)  $CD_8$
  - c)  $CD_{48}$
  - d)  $CD_{84}$
- 5) Which of the following is not an example of antigen presenting cells ?
  - a) Dendritic cells
  - b) Macrophages
  - c) B cells
  - d) Leydig cells

P.T.O.



- 6) A reaction that develops when a graft contains immunopotent T cells, that recognize and attack the recipient's cells, known as
- a) Hashimoto disease                      b) Fibrosis disease  
c) Graft-Versus-Host disease          d) Plasmocytolysis disease
- 7) \_\_\_\_\_ are a group of low molecular weight regulatory proteins secreted by white blood cells and variety of other cells in the body in response to a number of inducing stimuli.
- a) Integrins                      b) Cytokines                      c) Mucins                      d) Fusin
- 8) In \_\_\_\_\_ disease an Rh<sup>+</sup> fetus express an Rh antigen on its blood cells, that the Rh<sup>-</sup> mother does not express.
- a) multiple sclerosis                      b) spondylitis  
c) myasthenia gravis                      d) erythroblastosis fetalis
- 9) Antigen that activate B cell in the absence of T<sub>H</sub> cell are known as
- a) thymus – independent antigen          b) thymus – dependent antigen  
c) type I allergen                      d) type IV allergen
- 10) T-cell receptor can only recognize antigen, that is associated with cell membrane proteins known as
- a) major histocompatibility complex molecule  
b) cytokine molecule  
c) opsinogen  
d) anaphylatoxin molecule

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

10

- i) Define conjugate vaccines.
- ii) What is humoral immunity ?
- iii) Discuss in brief 'cytokines'.
- iv) State endocytic and phagocytic barriers of non-specific host defence.
- v) Define hypersensitivity.
- vi) Antigen presenting cells.



3. A) Answer **any two** of the following : **6**
- i) Explain Good Pasture's Syndrome.
  - ii) Describe ABO blood group system.
  - iii) Discuss in brief suppression of the allograft response.
- B) Write note on mechanism of graft rejection. **4**
4. Answer **any two** of the following : **10**
- i) Explain process of T-cell differentiation.
  - ii) Describe structure of class II MHC molecule.
  - iii) Describe IgE-mediated (Type – I) hypersensitivity.
5. Answer **any two** of the following : **10**
- i) Give brief account on B-cell maturation.
  - ii) Explain structure of class I MHC molecule.
  - iii) Explain Hemolytic disease of newborn.
-





Seat No.	
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**B.Sc. – III (Sem. – VI) Examination, 2014  
BIOTECHNOLOGY  
Food and Dairy Technology**

Day and Date : Friday, 11-4-2014

Total Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

- Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**  
3) **Write all answers in one answer sheet.**

1. Rewrite the complete sentence by selecting appropriate alternatives given. **10**
- i) Bacteria that must have organic molecules both for energy and as a source of carbon are called
    - a) Photoautotrophs
    - b) Photoheterotrophs
    - c) Chemoheterotrophs
    - d) Chemoautotrophs
  - ii) Removal of bacterial spore/cells from milk by centrifugation is called
    - a) Centrifugation
    - b) Filtration
    - c) Ultracentrifugation
    - d) Bactofugation
  - iii) For the preservation of vegetables food additives added are
    - a) Benzoate
    - b) Sorbitol
    - c) NaOH
    - d) Ammonia
  - iv) Water activity is defined as vapor pressure of \_\_\_\_\_ upon vepor pressure of solute.
    - a) Solute
    - b) Solution
    - c) Salt
    - d) Water
  - v) Viruses
    - a) are obligatory intracellular parasites
    - b) divide by binary fission
    - c) have their own metabolism
    - d) contain enzymes only



- vi) Souring of milk is the principle involved in the formation of
- a) Cheese
  - b) Cream
  - c) Curd
  - d) Butter
- vii) Raw food of marine origin causing food borne illness is due to
- a) E. Coli
  - b) Vibrio Parahaemolyticus
  - c) B. Cereus
  - d) Shigella
- viii) \_\_\_\_\_ is an example of hazard in HACCP.
- a) Bacterial spore
  - b) E. Coli
  - c) Fungal Spore
  - d) Botulism food poisoning
- ix) For the preservation of poultry, meat and fish the antibiotic added to these is
- a) chlorotetracycline
  - b) kanamycin
  - c) penicillin
  - d) streptomycin
- x) \_\_\_\_\_ usually contaminate meat and sausage product during cold storage.
- a) Thamidium elegans
  - b) E. Coli
  - c) Insect
  - d) None of these

2. Write short answers (**any five**) :

10

- 1) Yogurt production.
- 2) MBRT.
- 3) BS 5750.
- 4) Immunological methods of microbiological examination of foods.
- 5) Gamma radiation.
- 6) Bacterial and fungal toxins.



3. A) Write a short note on (**any two**) : **6**
- 1) Direct microbial examination of spoiled food.
  - 2) Production and types of cheese.
  - 3) Intrinsic factors affecting microbial growth with special reference to water activity.
- B) Give detail account of “food borne illness due to clostridium and add a note on bacterial spoilage of meat and meat products. **4**
4. Write a brief note on (**any two**) : **10**
- 1) Hazard Analysis Critical Care Point (HACCP).
  - 2) Microbial spoilage of different milk products.
  - 3) Rapid methods for detection of myco and bacterial toxins.
5. Write a brief note on (**any two**) : **10**
- 1) Vegetable/fruits spoilage and their preservation.
  - 2) Fermentation of food products with reference to sauerkraut.
  - 3) Immunological methods for detection of specific organisms in contaminated food.
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Seat No.	
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**B.Sc. (Biotechnology) (Semester – VI) Examination, 2014**  
**ENVIRONMENTAL STUDIES (Comp.)**

Day and Date : Sunday, 27-4-2014  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Multiple choice questions :

10

- I) Earth day is celebrated on \_\_\_\_\_.  
A) 22<sup>nd</sup> Jan.      B) 22<sup>nd</sup> Feb.      C) 22<sup>nd</sup> March      D) 22<sup>nd</sup> April
- II) 'Sahara' is an example of \_\_\_\_\_ ecosystem.  
A) Desert      B) Forest      C) Marine      D) Grassland
- III) Marine life is in danger due to \_\_\_\_\_ pollution.  
A) Air      B) Water      C) Land      D) Noise
- IV) \_\_\_\_\_ gas is responsible for ozone depletion.  
A) CFC      B) CO<sub>2</sub>      C) SO<sub>2</sub>      D) O<sub>2</sub>
- V) In India Wildlife Protection Act passed in \_\_\_\_\_.  
A) 1962      B) 1972      C) 1982      D) 1992
- VI) The main source of air pollution in India is \_\_\_\_\_.  
A) Automobiles      B) Industrialization  
C) Forest fire      D) Nuclear explosion
- VII) \_\_\_\_\_ percent of earth geographical area is under water.  
A) 60%      B) 61%      C) 70%      D) 71%
- VIII) Need for public awareness is important for the \_\_\_\_\_.  
A) AIDS      B) Malaria      C) Filariasis      D) Elephantiasis
- IX) The primary source of energy is \_\_\_\_\_.  
A) Wind      B) Sun      C) Hydal energy      D) Tidels
- X) Lion is \_\_\_\_\_ consumer in the ecosystem.  
A) Primary      B) Secondary      C) Tertiary      D) Heterotrophs

P.T.O.



2. Write short answers of the following (**any four** out of six) : **8**
- a) Definition of environment
  - b) Food chain of ecosystem
  - c) Causes of water pollution
  - d) Causes of generation of solid waste
  - e) Biodiversity in Western Ghat
  - f) Causes of population growth.
3. Write short notes of the following (**any four** out of six) : **12**
- a) Forest ecosystem
  - b) Uses of minerals
  - c) Nuclear Hazards
  - d) Remedies of water pollution
  - e) Effects of water pollution
  - f) Causes of noise pollution.
4. a) What is Forest resources ? Describe how forest resources can be conserved. **10**
- OR
- b) What is pollution ? Discuss the causes, effects and preventive measures of air pollution.
5. Define global warming. Explain the causes and effects of it. **10**
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Seat No.	
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**B.Sc. – I (Sem. – I) (New) (Biotechnology) Examination, 2014**  
**ENGLISH (Compulsory)**  
**‘On Track’ English Skills for Success**

Day and Date : Tuesday, 3-6-2014

Total Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

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

1. Rewrite the following sentences by choosing the correct alternative : 10
- 1) What did the policeman on the beat constantly do ?
    - a) twirl his stick
    - b) interrogate people on his beat
    - c) smoke a cigar
    - d) unlock doors
  - 2) The writer and Miss. Krishna
    - a) were at school together
    - b) met at an exhibition
    - c) met at a tea party
    - d) were neighbours
  - 3) When the writer invited her to stay with her for a while, Miss. Krishna agreed
    - a) reluctantly
    - b) shyly
    - c) readily
    - d) with little enthusiasm
  - 4) The word ‘intelligence’ is derived from the Latin word
    - a) intellegere
    - b) intellectual
    - c) intellect
    - d) none of these
  - 5) Where are the bangle sellers carrying their wares ?
    - a) to a married woman’s
    - b) to the house of a maiden woman
    - c) to a temple fair
    - d) to the streets
  - 6) An Irish Airman Foresees His Death is written by
    - a) W. B. Yeats
    - b) W. B. Keats
    - c) John Milton
    - d) Sarojini Naidu



- 7) Mina is fond \_\_\_\_\_ reading.  
a) of  
b) to  
c) on  
d) by
- 8) We flew over \_\_\_\_\_ Pacific Ocean.  
a) the  
b) a  
c) an  
d) no article
- 9) Let me give you \_\_\_\_\_ umbrella.  
a) a  
b) the  
c) an  
d) no article
- 10) There is a mob on the road. The underlined word is \_\_\_\_\_ noun.  
a) common  
b) mass  
c) proper  
d) collective

2. Answer **any five** of the following questions : 10

- 1) What was the nickname for Bob that the plain-clothes Policeman used ?
- 2) What is the narrator's initial opinion of Miss. Krishna ?
- 3) Why can computers not 'think' in the same way as human beings ?
- 4) Which colours of bangles are suitable for a maiden's wrists ?
- 5) How does the speaker imagine he will die ?
- 6) What are the bangles 'token' of ?

3. A) Write short answers of **any two** of the following : 6

- 1) What kind of person was Jimmy Wells ? Describe his character with suitable evidence from the story.
- 2) What is the shocking discovery made by Miss. Krishna's sister and the narrator together ? How does this reveal Miss. Krishna's character ?
- 3) What are the myths regarding the intelligence of the computers ?

B) Answer **any two** of the following questions briefly : 4

- 1) Describe the different types of bangles which the bangle sellers carry.
- 2) What is the Irish Airman's attitude towards the war he is fighting in ?
- 3) How does the poet describe the faithful wife who is now middle-aged ?



4. Answer **any one** of the following questions : **10**
- 1) Write an essay on the impact of mobile phones on the lives of young people in the present day.
  - 2) Write paragraphs of **five** or **six** sentences on **each** of the following :
    - a) solar energy
    - b) my family.

5. Read the following passage and make notes of it. Use an appropriate title for your notes. **10**

There are different forms of environmental pollution. Air pollution is caused by the burning of coal and oil. It can damage the earth's vegetation and cause respiratory problems in humans. A second type of pollution is noise pollution. It is the result of the noise of aircraft and heavy traffic. Further, loud music is also a cause of noise pollution, which has been seen to affect people's hearing and give them severe headaches and high blood pressure. Another source of pollution is radioactivity, which occurs when there is a leak from a nuclear power station. Radioactivity is a deadly pollutant, which kills and causes irreparable harm to those exposed to it. Land and water pollution is caused by the careless disposal of huge quantities of rubbish, sewage and chemical wastes. Pollution of rivers and seas kills fishes and other marine life and also becomes the cause of water – borne diseases. Land pollution, on the otherhand, Poisons the soil, making the food grown in it unfit for consumption.

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**B.Sc. – I (Semester – II) (New) Examination, 2014**  
**BIOTECHNOLOGY – ENVIRONMENTAL POLLUTION AND MICROBIAL**  
**TECHNIQUES**  
**Paper – I : Pollution**

Day and Date : Friday, 9-5-2014

Total Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the following sentences by choosing correct answer from the given alternatives : 10
- 1) \_\_\_\_\_ is responsible for acid rain.  
a) SO<sub>2</sub>                      b) CO                      c) CO<sub>2</sub>                      d) HCFC
  - 2) The permissible limit of COD in the water bodies is \_\_\_\_\_  
a) 100 ppm                      b) 10 ppm                      c) 250 ppm                      d) 0.1 ppm
  - 3) The species of chemical elements having same atomic number but differs in mass is known as  
a) Isomers                      b) Isotopes                      c) Radicals                      d) Ionic pairs
  - 4) Chernobyl nuclear disaster is associated with  
a) Acid rain                      b) Soil pollution  
c) Nuclear pollution                      d) Air pollution
  - 5) \_\_\_\_\_ is an example of renewable energy source.  
a) Geothermal energy                      b) Petroleum products  
c) Anthracite                      d) Kerosene
  - 6) \_\_\_\_\_ is the point source of water pollution.  
a) Industrial wastewater discharge                      b) Agricultural wastewater  
c) Storm water                      d) Urban wastewater
  - 7) \_\_\_\_\_ is responsible for deterioration of soil quality.  
a) Sulphurous compounds                      b) Excessive use of fertilizers  
c) Chloro Fluoro Carbons                      d) Oxygen demanding wastes



- 8) Excessive nitrates may cause the disease popularly known as
- |                      |                  |
|----------------------|------------------|
| a) Minamata          | b) Poliomyelitis |
| c) Blue baby disease | d) Giardiasis    |
- 9) Nuclear energy is generated by
- |                      |                      |
|----------------------|----------------------|
| a) Nuclear fission   | b) Nuclear division  |
| c) Nuclear collision | d) None of the above |
- 10) Radioactive material can be used for
- |                       |                  |
|-----------------------|------------------|
| a) Carbondating       | b) X-ray scan    |
| c) Food sterilization | d) All the above |

2. Answer **any five** of the following : **10**
- i) Write a brief account on Acid Rain.
  - ii) Explain impacts of eutrophication.
  - iii) Enlist uses of radioactive material.
  - iv) Write a note on wind energy.
  - v) Explain natural sources of air pollution.
  - vi) Enlist Green House gases responsible for global warming.
3. A) Answer **any two** of the following : **6**
- i) Give an account on vehicular pollution.
  - ii) Discuss about Minamata episode.
  - iii) Write a note on biogas generation.
- B) Define radioactivity. Explain energy generation by nuclear fission. **4**
4. Answer **any two** of the following : **10**
- i) Define air pollution. Explain sources effect and control measures of air pollution.
  - ii) What is soil salinity ? Explain the sources and effects of soil pollution.
  - iii) Explain renewable energy resources. Add a note on biomass energy.
5. Answer **any two** of the following : **10**
- i) What is eutrophication ? Explain sources and effects of water pollution.
  - ii) Write down important features of Air (Prevention and Control of Pollution) Act.
  - iii) Describe sources, impacts and control measures of global warming.
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**B.Sc. I (Biotechnology) (Semester – II) Examination, 2014**  
**ENVIRONMENTAL POLLUTION AND MICROBIAL TECHNIQUES (New)**  
**Paper – II : Microbial Techniques**

Day and Date : Saturday, 10-5-2014

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

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

1. Choose the correct alternative and rewrite the sentences again. **10**
- 1) \_\_\_\_\_ is used as a nitrogen source and buffering agent in the semisynthetic nutrient media.  
a) Meat extract    b) Peptone    c) Yeast extract    d) NaCl
  - 2) Mannitol salt agar is selectively used for growth of \_\_\_\_\_ organism.  
a) S. aureus    b) E. Coli    c) S. typhi    d) B. subtilis
  - 3) Nitrobacter spp. utilize energy from  
a) NO<sub>2</sub>    b) H<sub>2</sub>    c) H<sub>2</sub>S    d) Fe<sup>2+</sup>
  - 4) Gram's iodine is  
a) I<sup>ry</sup> stain    b) II<sup>ry</sup> stain    c) Mordant    d) Decolourizing agent
  - 5) Acid-Fast is example of  
a) Simple staining    b) Positive staining  
c) Negative staining    d) Differential staining
  - 6) Two log phases are separated by short lag phase is observed in \_\_\_\_\_ growth.  
a) normal    b) diauxic    c) synchronous    d) continuous
  - 7) \_\_\_\_\_ is used as pH indicator in MacConkey's agar.  
a) Bromothymol blue    b) Andrade's indicator  
c) Neutral red    d) Phenol red
  - 8) \_\_\_\_\_ is used in ophthalmic preparation as an antimicrobial agent.  
a) Mercuric chloride    b) Ethylene oxide  
c) Copper sulphate    d) Silver nitrate

P.T.O.



- 9) Autoclave at 15 lb pressure shows \_\_\_\_\_ temperature.  
a) 121.5°C      b) 115° C      c) 109° C      d) 100° C
- 10) Glasswares like petriplates and pipettes are mainly sterilized in  
a) Autoclave      b) Hot air oven      c) Tyndallizer      d) Pasteurizer
2. Define and explain (**any five**) of the following. **10**
- 1) Synchronous growth
  - 2) Stain
  - 3) Lyophilization
  - 4) Pasteurisation
  - 5) Pure culture
  - 6) Anaerobic microbes.
3. A) Write short notes (**any two**). **6**
- 1) Serial dilution technique
  - 2) Differential media
  - 3) Autoclave.
- B) Explain growth phases of Bacteria. **4**
4. Answer (**any two**) of the following. **10**
- 1) Explain anaerobic culture methods.
  - 2) Explain pure culture techniques.
  - 3) Explain differential staining techniques.
5. Answer (**any two**) of the following. **10**
- 1) Explain sterilization using chemical agent.
  - 2) Explain various components and indicators used in microbial nutrient media.
  - 3) Explain in brief selection of microorganisms using chemical, physical and biological methods.
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**B.Sc. I (Semester – II) Examination, 2014**  
**BIOTECHNOLOGY (New)**  
**Biometry & Tissue Culture (Paper – II) Introduction to Tissue Culture**

Day and Date : Saturday, 17-5-2014  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Rewrite the following sentences by choosing correct alternatives : **10**
- 1) Elements required by plants in concentration greater than 0.5 Mmol/Lit are referred as
    - a) Micro molecules
    - b) Macro molecules
    - c) Vitamins
    - d) Co-factors
  - 2) Micro-elements are essential as \_\_\_\_\_ for many biochemical reactions.
    - a) Co-factors
    - b) Catalysts
    - c) Enzymes
    - d) Carbon source
  - 3) \_\_\_\_\_ consider as father of plant tissue culture.
    - a) White
    - b) Skoog
    - c) Haberlandt
    - d) Thimann
  - 4) \_\_\_\_\_ is a type of organogenesis by which only adventitious root formation takes place.
    - a) Rhizogenesis
    - b) Caulogenesis
    - c) Embryogenesis
    - d) Cytogenesis
  - 5) Artificial seeds developed from
    - a) Callus culture
    - b) Micropropagation
    - c) Somatic embryoids
    - d) Anther culture
  - 6) \_\_\_\_\_ described procedure to obtain passaged monolayer.
    - a) Dulbecco
    - b) Eagle
    - c) Earle
    - d) Harrison



- 7) \_\_\_\_\_ method is quick and cheap method of cell separation.
- a) Enzymatical
  - b) Physical
  - c) Clinical
  - d) Orbital
- 8) Two important enzymes used for disaggregation of tissue are
- a) Trypsin and pectinase
  - b) Collagenase and pectinase
  - c) Cellulase and trypsin
  - d) Collagenase and trypsin
- 9) Most important protein required for growth of animal cell is
- a) Transferrin
  - b) Casein
  - c) Albumin
  - d) Globulin
- 10) Viable cells are impermeable to
- a) Diacetyl Fluorescin
  - b) Eosin Y
  - c) Propidium iodide
  - d) Fluorescin
2. Answer the following (**any five**) : **10**
- 1) Growth room in PTC
  - 2) Plant growth hormones
  - 3) Acclimatization
  - 4) Role of Inverted microscope
  - 5) Natural media
  - 6) Primary cell line.
3. a) Answer the following (**any two**) : **6**
- 1) Explain organ culture by plasma clot technique
  - 2) Write a note on callus culture
  - 3) Explain membrane integrity assay for viability.
- b) Explain in detail role of inorganic micronutrients in plant tissue culture. **4**
4. Answer the following (**any two**) : **10**
- 1) Discuss haploid plant production by anther culture
  - 2) Describe in detail suspension culture
  - 3) Give details of instruments used in animal tissue culture laboratory.
5. Answer the following (**any two**) : **10**
- 1) Explain different stages of invitro clonal propagation.
  - 2) Give details of cold trypsinization
  - 3) Describe in detail synthetic media for animal tissue culture.
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**B.Sc. – I (Semester – II) Examination, 2014**  
**BIOTECHNOLOGY (Old)**  
**Basic Biochemistry – II**

Day and Date : Friday, 9-5-2014  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

- N. B. :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate maximum marks.**  
3) **Write biochemical reactions where involved.**

1. Rewrite the following sentences by choosing correct alternative from the given options. 10
- 1) The number of base pairs present in each turn of B form of DNA helix is \_\_\_\_\_  
a) 9                      b) 10                      c) 11                      d) 12
  - 2) The charged molecule which is electrically neutral is known as \_\_\_\_\_  
a) cation                      b) anion                      c) zwitter ion                      d) none of these
  - 3) Pellagra is the condition caused by the deficiency of \_\_\_\_\_  
a) Riboflavin                      b) Vitamin C                      c) Niacin                      d) Vit. B<sub>6</sub>
  - 4) The place at which substrate binds with the enzyme is called \_\_\_\_\_  
a) allosteric site                      b) active site                      c) isomeric site                      d) none of these
  - 5) The  $\alpha$  amino acids react with \_\_\_\_\_ to form a purple, pink or blue complex.  
a) acid                      b) base                      c) ninhydrin                      d) ammonia
  - 6) The G – C base pair is more stable and stronger than A-T base pair due to \_\_\_\_\_  
a) purine – pyrimidine                      b) three hydrogen bonds  
c) two hydrogen bonds                      d) no hydrogen bonds
  - 7) \_\_\_\_\_ vitamin is required for synthesis of blood clotting factors.  
a) Vit. A                      b) Vit. B                      c) Vit. K                      d) Vit. E



8) Ribose and deoxyribose differ in their structure around carbon atom

- \_\_\_\_\_
- a) 2                      b) 3                      c) 4                      d) 5

9) \_\_\_\_\_ metabolite is excreted in urine in thiamine deficiency.

- a) pyruvate              b) glucose              c) FIG – LU              d) Xanthurenic acid

10)  $\alpha$  helix protein structure is stabilized by extensive \_\_\_\_\_ bonding.

- a) hydrogen              b) sulphur              c) C – C              d) ionic

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

- 1) Give two functions of lipids.
- 2) Define non essential amino acids with 2 examples.
- 3) Write about structure of nucleotide.
- 4) Define Km value.
- 5) Name two aromatic amino acids.
- 6) Define denaturation of protein.

3. A) Answer in short the following questions (**any 2**) : **6**

- 1) Explain Chargaff's rule of DNA composition.
- 2) Explain glutathione.
- 3) Write about isoenzymes.

B) Give an account of structure and function of tRNA. **4**

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

- 1) Explain Line Weaver Burk Plot.
- 2) Note on classification of proteins based on chemical nature and solubility.
- 3) Differentiate between DNA and RNA.

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

- 1) Illustrate biologically important peptides.
  - 2) Write a note on hydrocarbons.
  - 3) Give an account of deficiency of fat soluble vitamins.
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**B.Sc. – I (Sem. – II) Examination, 2014  
BIOTECHNOLOGY  
Cell Physiology – II (Old)**

Day and Date : Saturday, 10-5-2014  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Rewrite the following sentences by choosing correct alternatives given below. **10**
- 1) \_\_\_\_\_ type of cell signalling controls the behaviour of the organism.  
a) Autocrine  
b) Exocrine  
c) Endocrine  
d) Combinatorial
  - 2) \_\_\_\_\_ is act as second messenger during cell signalling.  
a)  $Ca^{2+}$   
b)  $Zn^{2+}$   
c)  $Cu^{2+}$   
d)  $Mn^{2+}$
  - 3) In *Xenopus* embryogenesis, mid-blastula transition is characterized by activation of \_\_\_\_\_ in embryonic cells.  
a) Protein synthesis  
b) Translation  
c) Transcription  
d) Replication
  - 4) In ascidian embryogenesis, yellow cytoplasm is rich in mitochondria which eventually gives rise to \_\_\_\_\_ and muscles.  
a) Ectoderm  
b) Endoderm  
c) Mesoderm  
d) Both a) and b)
  - 5) Cytoplasmic localizations of \_\_\_\_\_ may determine the initial differences between embryonic cells.  
a) cell determinants  
b) cell granules  
c) cell inclusions  
d) cell organelles
  - 6) Microvilli are cytoplasmic processes covered by plasma membrane, which increase the effective surface area of cell for \_\_\_\_\_.  
a) secretion  
b) transport  
c) absorption  
d) ultrafiltration



- 7) \_\_\_\_\_ are example of communicating junctions.
- a) Gap junction
  - b) Tight junction
  - c) Septate junction
  - d) Belt desmosome
- 8) The process of ingestion of large sized solid substances by the cell is known as \_\_\_\_\_
- a) Pinnocytosis
  - b) Transport
  - c) Cell drinking
  - d) Phagocytosis
- 9) \_\_\_\_\_ are required for proper localization of proteins in the cell.
- a) Localization key
  - b) Sorting signal
  - c) Bar code
  - d) Localization label
- 10) Unit membrane model of plasma membrane was proposed by \_\_\_\_\_
- a) Watson
  - b) Crick
  - c) Robertson
  - d) Singer and Nicolson
2. Answer the following (**any 5**) : **10**
- 1) What are receptors ?
  - 2) What is endocytosis ?
  - 3) Define pleuripotency.
  - 4) What are Hemi-desmosomes ?
  - 5) What are cell recognition molecules ?
  - 6) What are gap junctions ?
3. A). Answer the following (**any 2**) : **6**
- 1) Explain cell determinants with suitable example.
  - 2) Describe types of cell signalling.
  - 3) Describe fluid mosaic model of cell membrane.
- B) Describe in detail role of nuclear pores in protein transport. **4**
4. Answer the following (**any 2**) : **10**
- 1) Write an essay on active transport.
  - 2) Explain intracellular compartments.
  - 3) Explain differentiation of cell membrane with suitable examples.
5. Answer the following (**any 2**) : **10**
- 1) Describe protein trafficking in mitochondria and chloroplast.
  - 2) Write an detailed account on molecular mechanisms of cell differentiation.
  - 3) Explain in detail adhering junctions with suitable example.
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**B.Sc. – I (Sem. – II) (Biotechnology) Examination, 2014**  
**BASIC BIOTECHNOLOGY – II (Old)**

Day and Date : Monday, 12-5-2014  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Rewrite the following sentences by choosing correct alternatives given below : **10**
- 1) Variants selected in protoplast cultures have been referred to as \_\_\_\_\_  
a) Calliclones      b) Protoclones      c) Polyclones      d) Aneoclones
  - 2) Over population of \_\_\_\_\_ sometimes enhance the protein value of the variant cell lines.  
a) Auxins      b) Cytokinins      c) Amino acid      d) Antibodies
  - 3) Somaclonal variations are the ones \_\_\_\_\_  
a) caused by mutagens  
b) caused by hybridization  
c) Produced during tissue culture  
d) Induced during sexual embryogeny
  - 4) A GM crop is \_\_\_\_\_  
a) Irradiated crop      b) Transgenic crop  
c) Raised on green manure      d) Wild crop
  - 5) \_\_\_\_\_ enzymes are often used for isolation of protoplast.  
a) Gyrase      b) Polymerase      c) Cellulase      d) Invertase
  - 6) The organism used for production of 'BT' bioinsecticide belongs to the genus \_\_\_\_\_  
a) Borrelia      b) Bacillus      c) Bordetella      d) All of these
  - 7) \_\_\_\_\_ is novel technique involving combination of RFLP and RAPD.  
a) QTL      b) AFLP      c) SCAR's      d) STS



8) Bt cotton is preferred over other varieties of cotton because of its \_\_\_\_\_

- a) High yield
- b) Quick growth
- c) Weedicidal property
- d) Resistance to bollworm

9) Virus free plants can be obtained through \_\_\_\_\_

- a) Shoot tip culture
- b) Haploid culture
- c) Proto plast fusion
- d) Embryo culture

10) \_\_\_\_\_ preservation of cell suspension was considered as a potential method for plant germplasm storage.

- a) Freeze drying
- b) Cold storage
- c) Liquid N<sub>2</sub> freeze
- d) Freezing

2. Answer **any five** of the following : **10**

- i) Somoclones
- ii) Hybrids
- iii) Protoplast
- iv) Germ-plasm
- v) Pigments
- vi) Cloning.

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

- i) Write a note on protoplast culture.
- ii) Give an account of herbicide resistant plant.
- iii) Describe mechanism of aided breeding.

B) Explain how can we produce male sterile plants. **4**

4. Answer **any two** of the following : **10**

- i) Explain the mechanism of isolation of stress tolerant line.
- ii) Give detailed account of cytopreservation.
- iii) Describe method of production of plant resistant to pathogens.

5. Answer **any two** of the following : **10**

- i) How can we improve time of flowering in plants ?
  - ii) Explain RFLP on a molecular marker.
  - iii) Write a note on molecular marker assisted selection.
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**B.Sc. (Part – I) (Semester – II) (Biotechnology) Examination, 2014  
BASICS OF TISSUE CULTURE – II (Old)**

Day and Date : Tuesday, 13-5-2014  
Time : 11.00 a.m. to 1.00 p.m.

Total Marks : 50

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

1. Choose correct answer from the given alternative and rewrite the sentence : **10**
- 1) Use of tissue culture technique for micro propagation was first started by \_\_\_\_\_  
a) Mura Shigue      b) G. Morel      c) Mannae      d) Haber Landt
  - 2) \_\_\_\_\_ accelerates blood glucose level.  
a) Thyrotropin      b) Thyroxine      c) Glucagon      d) Insulin
  - 3) \_\_\_\_\_ is an androgen hormone present in vertebrates.  
a) Testosterone      b) Thyroxine      c) Calcitonine      d) ADH
  - 4) Endocrine glands are also known as \_\_\_\_\_  
a) Ductless glands      b) Duct glands  
c) Serous gland      d) Apoglands
  - 5) \_\_\_\_\_ is the simplest and most widely used fermenter.  
a) Air lift fermenter      b) Stirred tank reactor  
c) Hollow fibre bioreactor      d) Fluidized bed reactor
  - 6) Infection of dicot plant by \_\_\_\_\_ causes formation of hairy roots at the infection site.  
a) A. rhizogen      b) A. tumefacian  
c) A. spirogen      d) All of above
  - 7) \_\_\_\_\_ is the protein secreted by larvae of certain lepidopteron moth.  
a) Silk      b) Nylon      c) Polyester      d) Teflon





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**B.Sc. – I (Sem. – II) (Biotechnology) Examination, 2014**  
**MICROBIOLOGY – II**  
**(Section – I) (Old)**

Day and Date : Thursday, 15-5-2014  
Time : 11.00 a.m. to 1.00 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 selecting correct answer from given alternatives :

10

- 1) Root nodules of the leguminous plants contain \_\_\_\_\_
  - a) Rhizobium
  - b) Azotobacter
  - c) Bacillus thuringiensis
  - d) Pseudomonas
- 2) \_\_\_\_\_ is a primary stain in, acid fast staining of mycobacteria.
  - a) Crystal violet
  - b) Carbol fuchsin
  - c) Methylene blue
  - d) Basic fuchsin
- 3) Heat labile solutions can be sterilized by \_\_\_\_\_
  - a) autoclaving
  - b) lyophilisation
  - c) filtration
  - d) none of these
- 4) \_\_\_\_\_ is an example of dual fermentation.
  - a) Alcohol
  - b) Beer
  - c) Wine
  - d) Vinegar
- 5) \_\_\_\_\_ are present in fermentor to avoid vortex formation.
  - a) Baffle
  - b) Sparger
  - c) Impeller
  - d) None of these
- 6) \_\_\_\_\_ is an example of secondary metabolite produced by microorganisms.
  - a) Citric acid
  - b) Ethanol
  - c) Penicillin
  - d) Vitamin B<sub>12</sub>



- 7) \_\_\_\_\_ classification system is based on evolutionary relationship.
- |                 |              |
|-----------------|--------------|
| a) Phylogenetic | b) Phenetic  |
| c) Numerical    | d) Classical |
- 8) Lab scale fermentor have \_\_\_\_\_ liters of capacity.
- |            |                |
|------------|----------------|
| a) 1 – 2   | b) 50 – 100    |
| c) 20 – 50 | d) 1000 – 5000 |
- 9) \_\_\_\_\_ is an example of endoenzyme produced by microorganisms.
- |             |              |
|-------------|--------------|
| a) Lipase   | b) Amylase   |
| c) Protease | d) Invertase |
- 10) \_\_\_\_\_ is a variant bacterial strain with distinctive antigenic properties.
- |              |             |
|--------------|-------------|
| a) Morphovar | b) Biovar   |
| c) Serovar   | d) Pathovar |

2. Answer **any five** of the following : 10
- 1) Define – Sterilization.
  - 2) Define – Neutral stain. Give any two examples.
  - 3) Define – type strain.
  - 4) Give the recommended uses of hot air oven.
  - 5) Define – secondary metabolites. Give any two examples.
  - 6) What are antifoam agents ?
3. A) Answer **any two** of the following : 6
- 1) Write a note of negative staining.
  - 2) Give an account of nonionizing radiations for control of microorganisms.
  - 3) Write a note on recovery of fermentation product.
- B) Write a note on acid fast staining. 4
4. Write short notes on **any two** : 10
- 1) Morphological characters used for classification.
  - 2) Microbial enzymes.
  - 3) Moist heat sterilization.
5. Write short notes on **any two** : 10
- 1) Biogas production.
  - 2) Basic design of fermentor.
  - 3) Genetic improvement of industrial microbes.
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Seat No.	
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**B.Sc. – I (Semester – II) Examination, 2014**  
**BIOTECHNOLOGY (Old)**  
**Ecology – II**

Day and Date : Saturday, 17-5-2014  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Rewrite the following questions by choosing correct alternative given below : **10**
- 1) The ultimate sufferer of pollution is \_\_\_\_\_
    - a) Plant
    - b) Terrestrial animal
    - c) Aquatic animal
    - d) Man
  - 2) Component not released in burning of coal is \_\_\_\_\_
    - a) NO<sub>2</sub>
    - b) SO<sub>2</sub>
    - c) Fly ash
    - d) O<sub>2</sub>
  - 3) The causes of depletion of ozone layer in atmosphere is \_\_\_\_\_
    - a) Feron gases
    - b) Supersonic jet travels
    - c) Nitrogen oxides
    - d) All of these
  - 4) \_\_\_\_\_ is an example of Marine Pollution.
    - a) Bhopal gas tragedy
    - b) Chernobyl episode
    - c) Minamata episode
    - d) All of these
  - 5) Exposure of human body to radiation may cause \_\_\_\_\_
    - a) Polio
    - b) Hemophilia
    - c) Leukemia
    - d) Cholera
  - 6) MIC is related with \_\_\_\_\_
    - a) Taj Mahal
    - b) London Smog
    - c) Aerosols
    - d) Bhopal Gas Tragedy
  - 7) \_\_\_\_\_ gas is major contributor to atmosphere.
    - a) Oxygen
    - b) Nitrogen
    - c) Hydrogen
    - d) Carbon dioxide



- 8) \_\_\_\_\_ is leading source of energy used in United States.  
a) Coal                      b) Oil resources    c) Natural gas    d) Nuclear Power
- 9) \_\_\_\_\_ energy is derived from heated ground water.  
a) Solar energy                      b) Geothermal energy  
c) Hydroelectric energy              d) Nuclear energy
- 10) Largest source of air pollution is \_\_\_\_\_  
a) Industries              b) Vehicles              c) Sewage              d) Tanneries

2. Answer **any five** of the following : **10**

- i) Enlist local impacts of pollution.
- ii) Define COD and give its applications.
- iii) Give effects of mining on environment.
- iv) Define nuclear pollution and give its sources.
- v) Give various uses of isotopes.
- vi) Define solid waste and give its types.

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

- i) Describe effects of air pollutants on human and environment.
- ii) Explain various routes of soil pollution and add a note on soil salinity.
- iii) Explain non-conventional energy sources with suitable examples.

B) What is biogas ? Explain mechanism of biogas production and give its applications. **4**

4. Answer **any two** of the following : **10**

- i) Give detailed account of Chernobyl nuclear disaster.
- ii) Describe various impacts of industrialization and urbanization on environment.
- iii) Give detailed account of global warming and its consequences.

5. Answer **any two** of the following : **10**

- i) Describe energy plantation and give its applications.
  - ii) Enumerate the sources and effects of water pollution.
  - iii) Define eutrophication ? Explain mechanism of eutrophication and its applications.
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**B.Sc. I (Semester – II) Examination, 2014**  
**BIOTECHNOLOGY (Old)**  
**Biometry – II**

Day and Date : Monday, 19-5-2014  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Choose the correct alternative and write the sentence. **10**
- I) Data taken from the “Reserve Bank of India Bulletin” will be considered as  
a) Primary data b) Secondary data  
c) Primary and secondary data d) Tertiary data
- II) The number of observations corresponding to a variable is always  
a) A fraction b) May be negative  
c) An integer d) A whole number
- III) Which of the following is the first step in calculating the median of data set ?  
a) average the middle two values of the data set  
b) arrange the data in order  
c) determine the relative weights of the data values in terms of importance  
d) not necessary to arrange
- IV) Mode is  
a) middle most value b) the minimum value  
c) most frequent value d) the maximum value
- V) If 10 is subtracted from each observation then mean of the set of n observations is  
a) not affected b) zero  
c) increased by 10 d) decreased by 10

P.T.O.



- VI) In standard deviation, the deviations of the items  $x_i$  are always taken from  
 a) mean                      b) median                      c) mode                      d) zero
- VII) A measure of dispersion which is independent of units is  
 a) range    b) mean deviation  
 c) coefficient of variation                      d) standard deviation
- VIII) The key for opening a door is in a bunch of 10 keys. A man attempts to open the door by trying the keys at random. The probability that the door is opened is  
 a)  $\frac{4}{10}$                       b)  $\frac{3}{10}$                       c)  $\frac{2}{10}$                       d)  $\frac{1}{10}$
- IX) The formula for rank correlation coefficient is  
 a)  $\frac{\sum \sigma D^2}{N^3 - N}$                       b)  $-1 + \frac{\sum D^2}{\sigma(N^3 - N)}$   
 c)  $\frac{1 + \sum D^2}{\sigma(N^3 - N)}$                       d)  $1 - \frac{\sigma \sum D^2}{N^3 - N}$
- X) If two events A and B are independent then the probability that they will both occur is given by  
 a)  $P(A) + P(B)$                       b)  $P(A) \cdot P(B)$                       c)  $P(A) - P(B)$                       d)  $P(A)/P(B)$

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

10

- I) Define class mark and give an example.
- II) Find out the value of median if mean = 16 and mode = 21.
- III) If the smallest value in a set is 7 and its range is 85. What is the largest value of the set is ?
- IV) What are regression equations ? How they are useful ?
- V) A die is thrown. Find the probability of getting an odd number.
- VI) If the probability of hitting a target is 0.54. Write the probability of missing the target.



3. A) Answer **any two** of the following. 6

- I) Mean of 100 items is found to be 30. If at the time of calculations two items were wrongly taken as 32 and 12 instead of 23 and 11, find the correct mean.
- II) For a distribution, the C.V. and mean are 80% and 20 respectively. Find variance of that distribution.
- III) One lottery ticket is drawn at random from set of 40 tickets numbered from 1 to 40. What is the probability that the number on the ticket drawn is divisible by 3 or 4.

B) State the importance of statistics in biological sciences. 4

4. Answer **any two** of the following. 10

I) Calculate the median from table below

<b>Marks</b>	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
<b>Frequency</b>	22	38	46	34	20

- II) Discuss various types of diagrammatic or graphical representation of data.
- III) Write a short note on “Normal distribution”.

5. Answer **any two** of the following. 10

I) Calculate the standard deviation for 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

II) Find the regression line of Y and X, for the following data.

<b>X</b>	18	26	28	31	25	19	35
<b>Y</b>	11	16	19	17	14	11	24

III) Write a note on one way ANOVA. (Analysis of variance).

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SLR-D – 19

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**B.Sc. II Semester – III (Biotechnology) Examination, 2014**  
**GENETICS – I**  
**Mendelian & Population Genetics**

Day and Date : Wednesday, 21-5-2014  
Time : 3.00 p.m.to 5.00 p.m.

Total Marks : 50

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

1. Rewrite the following sentences by choosing correct alternative. 10
- 1) The genotype of the F<sub>1</sub> heterozygous tall plant is \_\_\_\_\_  
a) TT    b) Tt  
c) tt    d) none of the above
- 2) How many pairs of contrasting characters in pea plant were chosen by Mendel ?  
a) 2                                  b) 3                                  c) 4                                  d) 7
- 3) In inhibitory gene action F<sub>2</sub> progenics remain in \_\_\_\_\_  
a) 9 : 7                                  b) 9 : 3 : 4                                  c) 13 : 3                                  d) 15 : 1
- 4) Crossing over involves \_\_\_\_\_  
a) deletion of chromosome                  b) addition of chromosome  
c) exchange of genetic material              d) mutation
- 5) Universal recipient belongs to the blood group \_\_\_\_\_  
a) O                                  b) A                                  c) B                                  d) AB
- 6) Chromosomes of higher plants are made up of \_\_\_\_\_  
a) DNA + Histones                          b) DNA only  
c) RNA + DNA                                  d) DNA + pectines
- 7) Balbiani rings occur in \_\_\_\_\_  
a) Lampbrush chromosome                  b) heterosome  
c) allosome                                      d) polytene chromosome

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**SLR-D – 19**



- 8) A trisomic individual has a chromosome no. of \_\_\_\_\_  
a)  $2n + 1$                       b)  $2n - 1$                       c)  $2n + 3$                       d)  $2n + 2$
- 9) The effects of natural selection may be countered by \_\_\_\_\_  
a) gene flow                      b) genetic drift                      c) mutation                      d) inbreeding
- 10) In \_\_\_\_\_ inversion, contains the centromere within the inverted segment.  
a) pericentric                      b) paracentric                      c) acentric                      d) acrocentric

2. Answer **any five** of the following. **10**

- 1) Define epistasis.
- 2) Define interaction of gene.
- 3) Define linkage.
- 4) What is test cross ?
- 5) What is plasmid ?
- 6) Define gene frequency.

3. A) Answer **any two** of the following. **6**

- 1) Explain with suitable example co-dominance.
- 2) Describe mitochondrial inheritance.
- 3) Describe polytene chromosome.

B) Explain with suitable example law of independent assortment. **4**

4. Answer **any two** of the following. **10**

- 1) Describe inhibitory gene action.
- 2) What are multiple alleles ? Explain ABO blood group system in human.
- 3) Explain in detail euploidy.

5. Answer **any two** of the following. **10**

- 1) Explain the mechanism of crossing over.
  - 2) Describe Hardy-Weinberg Law.
  - 3) Describe genetic basis of evolution in wheat.
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**B.Sc. – II (Sem. – III) Examination, 2014**  
**BIOTECHNOLOGY**  
**Molecular Biology – I (Molecular Biology of Gene)**

Day and Date : Thursday, 22-5-2014  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

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

10

- 1) Split gene start and end with \_\_\_\_\_  
a) Intron                      b) muton                      c) recon                      d) exon
- 2) \_\_\_\_\_ plays important role in photoreactivation.  
a) photolyase                      b) Exonuclease  
c) endonuclease                      d) methylase
- 3) In A – DNA – base pairs are present in per turn of the helical.  
a) 10                      b) 11                      c) 12                      d) 13
- 4) A nucleoid consists of \_\_\_\_\_  
a) a ss DNA                      b) a single double stranded DNA  
c) histones and RNA                      d) histones and nonhistones
- 5) Centromere is also called \_\_\_\_\_  
a) Kinetochore                      b) Chromocentre  
c) Secondary constriction                      d) Kinetosome
- 6) Triplet codon refers to sequence of three bases on \_\_\_\_\_  
a) mRNA                      b) t RNA                      c) rRNA                      d) all the above
- 7) Histone protein synthesis occurs during \_\_\_\_\_  
a) G1 – phase                      b) G2 – phase                      c) S - phase                      d) Prophase
- 8) RNA does not possess \_\_\_\_\_  
a) Uracil                      b) Thymine                      c) Adenine                      d) Cytosine

P.T.O.



- 9) Okazaki fragments are \_\_\_\_\_
- a) Small segments of RNA
  - b) Small peptides
  - c) Small DNA fragments
  - d) Small DNA fragments formed over DNA template running in 3' → 5' direction

- 10) t RNA attaches amino acids at its \_\_\_\_\_
- a) 3' end
  - b) 5' end
  - c) anticodon
  - d) loop

2. Answer **any five** of the following : **10**

- 1) What are mini satellites ?
- 2) Define – Introns
- 3) Define – Gene
- 4) What is histone ?
- 5) Enlist the properties of B-DNA from.
- 6) What is cot curve ?

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

- 1) Explain the organization the viral genome.
- 2) Give an account of molecular nature of gene.
- 3) What is SOS repair mechanism ?

B) Write an essay on – structure and functions of t RNA. **4**

4. Write short notes on **any two** of the following : **10**

- 1) DNA damage
- 2) Euchromatin
- 3) Mechanism of DNA replication in prokaryotes.

5. Write short notes on **any two** of the following : **10**

- 1) Genetic code
  - 2) Nucleotide excision repair
  - 3) Regularity sequences.
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**B.Sc. – II (Semester – III) Examination, 2014**  
**BIOTECHNOLOGY**  
**Methods in Biotechnology – I (Biophysical Techniques)**

Day and Date : Friday, 23-5-2014  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Rewrite the following sentences by selecting the most correct answer from given options. **10**
- i) In most of the nephelometers detector is generally fixed at \_\_\_\_\_ angle to the source beam.
- a) 45°                      b) 60°                      c) 90°                      d) 120°
- ii) Glass electrode contains \_\_\_\_\_ solution.
- a) silver, silver chloride and 0.1 M HCl  
b) mercury, mercury chloride and saturated potassium chloride  
c) silver, silver sulphate and 0.1M HNO<sub>3</sub>  
d) mercury, silver and bromine water
- iii) Beer's law states that absorbance due to coloured solution is directly proportion to the
- a) intensity of light  
b) concentration of absorbing material  
c) thickness of material  
d) shape of cuvette
- iv) Centrifuge machine uses \_\_\_\_\_ force for bringing sedimentation.
- a) centrifugal                      b) centripetal  
c) electrical                      d) magnetic

P.T.O.



- v) Holes in fixed-angle rotors of centrifuge head lies to a fixed angle between \_\_\_\_\_ to rotor shaft.
- a)  $0^\circ$  and  $90^\circ$                       b)  $14^\circ$  and  $40^\circ$   
c)  $45^\circ$  and  $90^\circ$                       d)  $0^\circ$  and  $45^\circ$
- vi) In scanning electron microscope \_\_\_\_\_ electrons are detected.
- a) transmitted                              b) back scattered/secondary  
c) primary                                      d) all of a, b and c
- vii) The phenomena of natural radioactivity was first discovered by
- a) Alfred Nobel                              b) Ernest Rutherford  
c) Madam Curie                                d) Henri Becquerel
- viii) The ratio of \_\_\_\_\_ determines the stability of isotopes in nature.
- a) electron to proton                        b) neutron to proton  
c) electron to neutron                        d) proton to electron
- ix) Rotating wheel placed between a lamp and a flame in atomic absorption spectrophotometer is known as
- a) atomiser                                      b) nebuliser  
c) chopper                                        d) amplifier
- x) In spectrophotometry, the light source mostly used for UV range is \_\_\_\_\_ lamp.
- a) sodium                                        b) tungsten  
c) hydrogen                                      d) either deuterium or hydrogen

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

10

- i) State the Beer-Lambert's law.
- ii) Distinguish between acid and base.
- iii) Explain the terms-rate zonal centrifugation and isopycnic centrifugation.
- iv) Define and explain -numerical aperture in light microscope.
- v) Discuss the negatron emission in isotope decay.
- vi) Give applications of visible spectrophotometry.



3. A) Answer **any two** of the following : **6**
- i) Explain the theory of UV spectrophotometry.
  - ii) Write a note on differential centrifugation.
  - iii) Describe the process of operation and calibration of pH meter.
- B) With neat and labelled diagram explain liquid scintillation counter. **4**
4. Answer **any two** of the following : **10**
- i) Describe the design and practice of transmission electron microscopy.
  - ii) Explain in detail about radioimmuno assay.
  - iii) Write a note on-principle, instrumentation and applications of UV spectroscopy.
5. Answer **any two** of the following : **10**
- i) Illustrate in detail the G.M. counter for detection and measurement of radioactivity.
  - ii) Give a brief account of types of rotors used in centrifuge machine.
  - iii) Discuss in detail instrumentation and working of nephelometry.
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**B.Sc. II (Semester – III) Biotechnology Examination, 2014  
ENVIRONMENTAL BIOTECHNOLOGY – I  
(Pollution and Toxicology)**

Day and Date : Saturday, 24-5-2014

Max. Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

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

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

10

- i) \_\_\_\_\_ are biodegradable waste products.
- a) rubber, plastic, manure
  - b) metal, glass, plastic
  - c) vegetable peels, garden refuse, paper
  - d) glass, wood cuttings, batteries
- ii) The main cause of water pollution is
- a) treated sewage, glass bottles and plastic bags
  - b) chemical effluent, leaching of pesticides and algae
  - c) pesticides, treated sewage and litter
  - d) oil spills, untreated sewage and chemical effluent
- iii) Depletion of ozone layer in outer atmosphere is incidence of
- a) skin cancer
  - b) lung cancer
  - c) bronchitis
  - d) asthma

P.T.O.



- iv) Green house effect causes
- a) cooling of the earth
  - b) warming of the earth
  - c) trapping of UV rays
  - d) production of cereals
- v) Rain is called as acid rain when its pH is below
- a) 7
  - b) 6.5
  - c) 6
  - d) 5.6
- vi) The term “Bio-magnification” refers to the
- a) growth of organism due to food consumption
  - b) increase in population size
  - c) blowing up of environmental issues by men
  - d) increase in concentration of non degradable pollutants as they pass through food chain
- vii) The \_\_\_\_\_ is the concentration estimated to produce mortality in 50% of a test population over a specific time period.
- a) LD 50
  - b) LC 50
  - c) EC 50
  - d) half life
- viii) DDT is an example of
- a) antibiotic
  - b) biodegradable pollutant
  - c) non-biodegradable pollutant
  - d) All of these
- ix) Most harmful environmental pollutants are
- a) biodegradable
  - b) corrosive agents
  - c) non-biodegradable chemicals
  - d) all of these
- x) The primary organ that is involved in detoxification process is
- a) liver
  - b) lung
  - c) mucosa
  - d) skin



2. Answer **any five** of the following : **10**
- i) State the types of toxic substances.
  - ii) What is lead pollution ?
  - iii) Enlist the router of toxicants to human body.
  - iv) What is the effect of global warming ?
  - v) Explain the thermal effluents.
  - vi) Define the terms lethal dose and sub-lethal dose.
3. A) Answer **any two** of the following : **6**
- i) Write a note on oil pollution.
  - ii) Give the various principles of toxicology.
  - iii) What is LD 50 ? How it is determined ?
- B) Explain various sources of air pollution. **4**
4. Answer **any two** of the following. **10**
- i) Explain impacts of radioactive pollution. Add a note on radioactivity of hydro carbons.
  - ii) What are agricultural drainages ? Explain with phenomenon of eutrophication.
  - iii) Explain various routes of transport of toxicants by air and water.
5. Answer **any two** of the following : **10**
- i) What is soil pollution ? Explain sources, effects and control measures of soil pollution.
  - ii) Discuss the dose-response relationship between chemical and biological reactions in human body.
  - iii) Define hydrocarbon. Explain mechanism of transport and diffusion of hydrocarbons.
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**B.Sc. – II (Biotechnology) (Semester – III) Examination, 2014**  
**BIOENERGETICS AND METABOLISM – I**  
**Bioenergetics and Thermodynamics**

Day and Date : Monday, 26-5-2014  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Rewrite the sentences by choosing correct alternative given below : **10**
- i) The reaction is said to be at equilibrium when its actual free energy change is \_\_\_\_\_  
a) Negative      b) Positive      c) Zero      d) One
- ii) For spontaneous reactions the sum of entropy of system and surrounding is always \_\_\_\_\_  
a)  $> 0$       b)  $< 0$       c)  $= 0$       d)  $\leq 0$
- iii) The electron donating molecule in an oxidation reduction reaction is called as \_\_\_\_\_  
a) Oxidant      b) Reductant  
c) Oxidizing agent      d) Both a) and c)
- iv) \_\_\_\_\_ coenzyme is involved in decarboxylation reactions of  $\alpha$ -keto acids.  
a) Tetrahydrofolate      b) Cobamide  
c)  $\text{NAD}^+$       d) TPP
- v) \_\_\_\_\_ is protease enzyme which specifically cleaves carboxy terminal amino acid.  
a) Chymotrypsin      b) Carboxy peptidase  
c) Lysozyme      d) All of these

P.T.O.





- vi) \_\_\_\_\_ inhibitor can bind only to free enzyme not to the enzyme-substrate complex.
- |                    |                  |
|--------------------|------------------|
| a) Competitive     | b) Uncompetitive |
| c) Non-competitive | d) Mixed         |
- vii) The bell shaped curve is obtained for effect of \_\_\_\_\_ on enzyme activity.
- |                         |                            |
|-------------------------|----------------------------|
| a) Enzyme concentration | b) Substrate concentration |
| c) Temperature          | d) All of these            |
- viii) The standard free energy change of hydrolysis of ATP to ADP is \_\_\_\_\_ Kcal/mole.
- |        |          |          |         |
|--------|----------|----------|---------|
| a) -35 | b) -30.5 | c) -15.7 | d) -7.3 |
|--------|----------|----------|---------|
- ix) The relationship between free energy, enthalpy and entropy is given by \_\_\_\_\_
- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| a) $\Delta G = \Delta H - T \Delta S$ | b) $\Delta H = \Delta G - T \Delta S$ |
| c) $\Delta S = \Delta G - T \Delta H$ | d) $\Delta S = \Delta H - T \Delta G$ |
- x) Among the following \_\_\_\_\_ has highest group transfer potential.
- |                            |
|----------------------------|
| a) 1,3-Bisphosphoglycerate |
| b) Creatinine phosphate    |
| c) Carbonyl phosphate      |
| d) Phosphoenol pyruvate    |

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

10

- i) Give second law of thermodynamics.
- ii) State first order reaction. What is its kinetic ?
- iii) Define Katal the unit of enzyme activity.
- iv) What are high energy phosphate compound ? Mention two examples.
- v) Explain coupled reaction.
- vi) What is oxidation in terms of electron ? Give one example.



3. A) Answer **any two** of the following : **6**
- i) Give the applications of thermodynamics in biochemistry.
  - ii) What is coenzyme ? What is the role of TPP and FAD as coenzyme ?
  - iii) Explain the hydrolysis of ATP.
- B) Describe in detail the effect of substrate concentration on enzyme activity. **4**
4. Answer **any two** of the following : **10**
- i) Give the significance of  $K_m$ . Derive line weaver Burk's equation and plot it.
  - ii) What is standard free energy change ? How it is determined for a reaction ?
  - iii) What is non-competitive inhibitor ? Give its effect on  $K_m$  and  $V_{max}$  of enzymatic reaction.
5. Answer **any two** of the following: **10**
- i) What is redox potential ? Explain in detail how it is measured.
  - ii) Discuss in detail the mechanism of action of enzyme lysozyme.
  - iii) How covalent catalysis, strain and distortion theory involved in enzyme efficiency ?
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**B.Sc. II (Semester – IV) Examination, 2014**  
**BIOTECHNOLOGY**  
**Genetics II (Microbial Genetics)**

Day and Date : Thursday, 24-4-2014

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the following by selecting right alternative : 10
- i) Plasmid is an extrachromosomal \_\_\_\_\_ DNA molecule present in most bacteria.
    - a) linear
    - b) supercoiled
    - c) circular
    - d) fibrillar
  - ii) A plasmid capable of preparing its own DNA for transfer is called
    - a) conjugative
    - b) transmissible
    - c) nontransmissible
    - d) mobilizable
  - iii) \_\_\_\_\_ type of mutation involves replacement of purine by another purine.
    - a) deletion
    - b) transition
    - c) transversion
    - d) inversion
  - iv) Recombination frequency is determined by \_\_\_\_\_ in two genes.
    - a) similarity
    - b) difference
    - c) distance
    - d) dissimilarity
  - v) 5 BU (5-bromouracil) is an analog of \_\_\_\_\_ base.
    - a) Uracil
    - b) Adenine
    - c) Thymine
    - d) Cytasine
  - vi) \_\_\_\_\_ phage mediates generalised transduction.
    - a)  $\lambda$
    - b) Mu
    - c) P22
    - d) T4



- vii) Acridine dyes lead to \_\_\_\_\_ to cause mutation.
  - a) inversion
  - b) reversion
  - c) intercalation
  - d) transposition
- viii) Is element contain coding sequences that are initiated by \_\_\_\_\_ codon.
  - a) GUG
  - b) AUG
  - c) UAA
  - d) UAG
- ix) \_\_\_\_\_ test was discovered by Luria and Delbruck to prove spontaneous nature of mutation.
  - a) Cis-trans
  - b) Chi square
  - c) Fluctuation
  - d) Hybridization
- x) An exposure of bacteria to (EMS) ethylmethylsulfonate causes \_\_\_\_\_ of purines.
  - a) alkylation
  - b) amination
  - c) acetylation
  - d) deamination

2. Answer **any five** of the following : **10**

- i) Write properties of a vector.
- ii) Describe effects caused by nitrous acid.
- iii) Write about lethal mutations.
- iv) What is a partial diploid ? Write about its formation.
- v) Explain 'Generalised transduction'.
- vi) Elaborate on structure of transposon.

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

- i) Give an account of mutations caused by acridine dyes.
- ii) Describe structure and properties of R plasmid.
- iii) Describe composite transposons.

B) Give an account of mutations caused by ultraviolet radiations. **4**

4. Answer **any two** of the following : **10**

- i) Write on transfer of plasmid.
- ii) Describe bacterial conjugation.
- iii) Describe replica plate technique.

5. Answer **any two** of the following : **10**

- i) Give an account of complementation analysis.
  - ii) Describe replicative transposition.
  - iii) Write on isolating of plasmids.
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**B.Sc. – II (Biotechnology) (Semester – IV) Examination, 2014**  
**MOLECULAR BIOLOGY – II**  
**(Regulation and Gene Expression)**

Day and Date : Friday, 25-4-2014  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Rewrite the following sentences by choosing correct alternatives : **10**
- 1) In eukaryotic transcription, rRNA molecules are synthesized by \_\_\_\_\_  
a) RNA polymerase – I                      b) RNA polymerase – II  
c) RNA polymerase – III                    d) RNA polymerase – IV
  - 2) \_\_\_\_\_ site on DNA, responsible for binding of enzyme RNA polymerase during transcription process.  
a) Operator              b) Promoter              c) Regulator              d) Enhancer
  - 3) In prokaryotic transcription process, the promoter sequences are recognized by \_\_\_\_\_ subunit of RNA polymerase.  
a) Alpha                      b) Beta                      c) Omega                      d) Sigma factor
  - 4) In prokaryotes, the mRNA molecule is \_\_\_\_\_  
a) Monocistronic              b) Polycistronic              c) Unicistronic              d) Bicistronic
  - 5) In prokaryotic translation process, the initiator tRNA molecule is \_\_\_\_\_  
a) t-RNA<sup>fmet</sup>                      b) t-RNA<sup>met</sup>                      c) t-RNA<sup>Leu</sup>                      d) t-RNA<sup>Ala</sup>
  - 6) In prokaryotic translation process, the Shine-Dalgarno sequences are \_\_\_\_\_  
a) AGG AGG U              b) GAG GAG U              c) UAG UAG U              d) GGA GGA U
  - 7) The first step in translation is \_\_\_\_\_  
a) Transfer of amino acid                      b) Initiation of synthesis of t-RNA  
c) Activation of amino acid                      d) None of these
  - 8) The operon model is proposed by \_\_\_\_\_ in 1961.  
a) Jacob and Monod                      b) H. G. Khurana  
c) Robert Holly                      d) W. M. Nizenberg



9) Lactose operon has \_\_\_\_\_ structural genes in sequential manner.

- a) Lac-z, Lac-c, Lac-y                      b) Lac-z, Lac-y, Lac-a  
c) Lac-x, Lac-y, Lac-z                      d) Lac-z, Lac-y, Lac-x

10) In trp operon, tryptophan is acts as \_\_\_\_\_

- a) Repressor molecule                      b) Binding protein  
c) Co-repressor molecule                      d) Inducer molecule

2. Answer **any five** of the following : **10**

- 1) What is meant by spliceosome ?
- 2) What is operon ?
- 3) Define polysomes.
- 4) What is molecular chaperons ?
- 5) CTD domain of RNA polymerase – II.
- 6) What is meant by repressor protein ?

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

- 1) Inhibitors of transcription.
- 2) Ribosome's.
- 3) Initiation of translation process in eukaryotes.

B) Write a note on mRNA processing in eukaryotes. **4**

4. Answer **any two** of the following : **10**

- 1) Explain regulation of transcription in prokaryotes.
- 2) Describe in detail regulation of translation.
- 3) Describe regulation of operon in Lac operon.

5. Answer **any two** of the following : **10**

- 1) Explain process of translation in prokaryotes.
  - 2) Post-translational modifications of proteins.
  - 3) Regulation of transcription in eukaryotes with two suitable examples.
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**B.Sc. II (Biotechnology) (Semester – IV) Examination, 2014**  
**ENVIRONMENTAL BIOTECHNOLOGY – II**  
**Bioenergy and Bioremediation**

Day and Date : Monday, 28-4-2014

Total Marks : 50

Time : 11.00 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. Rewrite the following sentences by choosing correct alternative given below : **10**

- 1) The living organisms on earth get maximum energy from  
a) Wind                      b) Wave                      c) Sun                      d) Water
- 2) Biodiesel can be manufactured from fats or oil by \_\_\_\_\_ process.  
a) Oxo                                      b) Weizmann  
c) Transesterification                      d) Distillation
- 3) Phytoremediation is carried out with the help of  
a) Eichhornia              b) Rhizobium              c) Arabidopsis              d) Casuarina
- 4) OTEC means  
a) Ocean Thermal Energy conversion  
b) Ocean Transport and Energy Commission  
c) Ocean and Tidal Energy Conversion  
d) Trans Ocean Energy Commission
- 5) The plant family which contains higher percentage of hydrocarbons is  
a) Poaceae                                      b) Compositae  
c) Euphorbiaceae                              d) Moraceae

P.T.O.



6) A treatment process that uses micro-organisms to break hazardous substances into less toxic substances is known as

- a) Biotransformation                      b) Bioremediation  
c) Detoxification                          d) Decontamination

7) Groundwater may be contaminated by

- a) Agricultural waste                      b) Domestic waste  
c) Industrial waste                         d) All the above

8) Biodegradability of Pesticides in soil is strongly affected by

- a) pesticide concentration              b) type of crops  
c) soil moisture                             d) application method used

9) \_\_\_\_\_ is a yard waste component.

- a) PET cans      b) Grass              c) Glass              d) None of the above

10) The Persistence of DDT in soil is

- a) 10 Months      b) 18 days              c) 10 years              d) 25 days

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

**10**

- i) Explain bioaugmentation.  
ii) What is meant by Bio-energy ? Enlist its sources.  
iii) Give the composition of biogas.  
iv) Define gasification and Enlist factors affecting on gasification.  
v) What is In-situ and Ex-situ remediation of soil ?

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

**6**

- i) How the soil decontamination carried out ? Explain with suitable example.  
ii) Explain Land fill leachate biotreatment technologies.  
iii) Describe Energy use pattern in India.

B) What is phytoremediation ? Describe various plant species involved in phytoremediation.

**4**





4. Answer **any two** of the following : **10**
- i) Sun as a source of energy – Explain in detail.
  - ii) Explain in detail the various conversion processes of biomass.
  - iii) How the soil contaminated with petroleum hydrocarbons can be recovered ?
5. Answer **any two** of the following : **10**
- i) Explain bioremediation of water.
  - ii) Comment on biogas production with the help of reactions and give the uses of biogas.
  - iii) Explain the impact of Energy use pattern on Environment.
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**B.Sc. (Part – II) (Semester – IV) (Biotechnology) Examination, 2014**  
**BIOENERGETICS AND METABOLISM – II**  
**Metabolism**

Day and Date : Tuesday, 29-4-2014

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

- N.B. :** 1) **All questions are compulsory.**  
2) **Draw labelled, neat diagram wherever necessary.**  
3) **Figures to right indicates full marks.**

1. Write following sentences by selecting most correct answer from the given options. **10**
- 1) Fructose 1, 6 bisphosphate is cleaved to yield glyceraldehyde 3 phosphate and dihydroxy acetone phosphate with the help of enzyme \_\_\_\_\_  
a) Aldolase      b) Epimerase      c) Ketolase      d) Recimase
  - 2) Which of the following substance represent the unsaturated fatty acid ?  
a) Palmitate      b) Stearate      c) Choline      d) Oleate
  - 3) Adenosine 5 Monophosphate and Guanosine 5 monophosphate contains the \_\_\_\_\_ purine bases.  
a) Thiamine and Cytosine      b) Uracil and Adenosine  
c) Adenine and Guanine      d) Adenosine and Ribosine
  - 4) The inhibitors \_\_\_\_\_ block electron transfer in NADHQ reductase and thereby prevents the utilization of NADH as substrate.  
a) Amytal      b) Retenone  
c) Both a) and b)      d) CN<sup>-</sup>
  - 5) Which of the following are common features in glycogen synthesis and breakdown \_\_\_\_\_  
a) both require UDP – glucose  
b) both are drivent in part by hydrolysis of pyrophosphate  
c) both involve glucose 1 phosphate  
d) both use same enzyme for branching and debranching



- 6) The conversion of the  $\Delta^2$  enoyl CoA to LB – hydroxyacyl CoA is carried out by enzyme \_\_\_\_\_
- a) enoyl CoA hydratase                      b) acyl CoA dehydrogenase  
c) enoyl CoA dehydrogenase              d) enoyl CoA acylase
- 7) Uncoupling of oxidative phosphorylation implies that \_\_\_\_\_
- a) The ATPase activity of mitochondria is abolished  
b) The mitochondria stops to oxidise succinate  
c) ATP formation ceases but respiration continues  
d) ATP formation continues but respiration ceases
- 8) Given below are the 4 enzymatic reactions involved in glycolysis. In which of the following steps is ATP generated \_\_\_\_\_ ?
- a) 2 phosphoglycerate to phosphoenolpyruvate  
b) glucose 6 phosphate to fructose 6 phosphate  
c) phosphoenol pyruvate to pyruvate  
d) glyceraldehyde 3 phosphate to 1, 3 bisphosphoglycerate
- 9) Conversion of ribonucleotides to deoxyribonucleotides by the reduction process is carried out by enzyme \_\_\_\_\_
- a) Alanine reductase                      b) Monophosphate oxidase  
c) Ribonucleotide reductase              d) Alanase
- 10) Most of the  $\text{CO}_2$  from catabolism of glucose is released during \_\_\_\_\_
- a) Glycolysis                                  b) Lactate fermentation  
c) Oxidative phosphorylation              d) Kreb's cycle

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

10

- 1) What is the significance of pentose phosphate pathway ?
- 2) Define glycogenolysis.
- 3) Define saturated and unsaturated fatty acids.
- 4) Define deamination and decarboxylation process.
- 5) Define process of photosynthesis.
- 6) What are sphingolipids and glycolipids ? Give example of each.



3. A) Answer **any two** from the following : **6**
- 1) Write an account of yield of ATP by fatty acid oxidation.
  - 2) Write a note on regulation of glycolysis pathway.
  - 3) Write an account on transamination reaction by giving an example.
- B) Write the pathway for TCA cycle. **4**
4. Answer **any two** of the following : **10**
- 1) Explain the transfer of electrons through mitochondrial electron transport chain.
  - 2) Describe biosynthesis of saturated fatty acid.
  - 3) Write the pathway for gluconeogenesis.
5. Answer **any two** of the following : **10**
- 1) Write a short note on inhibitors of electron transport chain.
  - 2) Write the pathway for synthesis of pyrimidine nucleotides.
  - 3) Write pathway for urea cycle.
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**B.Sc. (Part – III) (Semester – V) Examination, 2014**  
**BIOTECHNOLOGY**  
**Fermentation Technology**

Day and Date : Friday, 11-4-2014  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Choose the correct alternative and rewrite the sentence again. **10**
- 1) \_\_\_\_\_ is the crude organic antifoam agent.
- a) Silicon compound                      b) Phenyl acetic acid  
c) Lard oil                                      d) Citric acid
- 2) Indicator plate technique is used for screening of organisms producing \_\_\_\_\_
- a) Organic acids and amines              b) Vitamins  
c) Antibiotics                                      d) Gases
- 3) For turbidimetric assays \_\_\_\_\_ media are used.
- a) Solid    b) Semisolid  
c) Liquid    d) Solid and liquid
- 4) Economic fermentation of an industrial product is done by using \_\_\_\_\_
- a) Semi synthetic media                      b) Living media  
c) Synthetic media                              d) Waste as raw material
- 5) In ethanol production, the concentration of molasses is adjusted between \_\_\_\_\_
- a) 10 – 18%              b) 50 – 55%              c) 30 – 40%              d) 1 – 10%

P.T.O.



- 6) \_\_\_\_\_ is the water extract by-product from the dairy industry.
- a) Cornsteep liquor                      b) Whey  
c) Sulfite waste liquor                  d) Molasses
- 7) Solvent extraction is used for recovery of \_\_\_\_\_
- a) alcohol                                      b) amylase  
c) penicillin                                  d) none of these
- 8) Scale up study is started with \_\_\_\_\_
- a) Erlenmeyers flasks                      b) Pilot plants  
c) Seed tank                                  d) Production tank
- 9) \_\_\_\_\_ technique is used for primary screening of antibiotic producers.
- a) Giant colony                              b) Crowded plate  
c) Indicator plate                              d) Streak plate
- 10) The submerged culture production of amylase is carried out by \_\_\_\_\_
- a) Aspergillus niger                      b) E. coli  
c) Saccharomyces cerevisiae              d) B. subtilis

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

**10**

- 1) Enlist the microorganisms used for penicillin production.
- 2) Write down the applications of citric acid.
- 3) Define – Bioinsecticide.
- 4) Which are the different microbiological assays ?
- 5) Enlist the methods of culture preservation.
- 6) Define – Screening.



3. A) Write short answers on **(any 2)** : **6**
- 1) Give an account of raw materials used in fermentation.
  - 2) Recovery of vitamin B<sub>12</sub>.
  - 3) Production strain in fermentation.
- B) Give an account of basic design of fermentor. **4**
4. Write short notes on **(any 2)** : **10**
- 1) Scale up of fermentation.
  - 2) Citric acid fermentation.
  - 3) Precipitation and Distillation as recovery process.
5. Write short notes on **(any 2)** : **10**
- 1) Use of computer in fermentation technology.
  - 2) Sterilization of media.
  - 3) Strain improvement.
-







- 7) The quarrel \_\_\_\_\_ so much that I lost the peace of my mind.  
 a) Ruffled by features                      b) Broke me down  
 c) Drew the line                              d) Stumbled block
- 8) I wanted to be a collector but now \_\_\_\_\_ about it.  
 a) Have no wish                              b) Have second thoughts  
 c) Have a doubt                              d) None
- 9) Reading is her \_\_\_\_\_ and butter.  
 a) Wheat                      b) Bread                      c) Milk                      d) Cake
- 10) T.C.S. is \_\_\_\_\_ Company.  
 a) Complicated                              b) Many nations  
 c) Multi-national                              d) Regional

2. Answer **any five** of the following questions briefly : **10**

- 1) Write a note on six pillars of self-esteem.
- 2) What are the advantages of self-esteem ?
- 3) What is scientific point of view ?
- 4) What is the difference between scientist and judge ?
- 5) What is the end of the story 'Sparrows' ?
- 6) What made Rahim Khan ill ?

3. A) Answer **any two** of the following questions briefly : **6**

- 1) How is the condition of sick children ?
- 2) What is the central theme of the poem 'Refugee Mother and Child' ?
- 3) Describe in brief the daffodils effect on poet's mind.

B) Answer **any two** of the following : **4**

- 1) What do you do when work pressure suddenly increases ?
- 2) How you will adapt any critical situation ?
- 3) State the ways by which you manage your time better.



4. A) Write a description of a person who sat opposite you on a train journey. Remember to use the words to convey character, thoughts, mood, attitude of the person. **10**

OR

B) Write a description of a famous T.V. Actor you met at the function. Remember to use the words to convey the character, thoughts, mood, attitude of the actor seemed to be.

5. Read the passage below and write one-third summary of it. **10**

Mr. Spectator is a learned person exposed to foreign culture and ways of thinking because of his travels abroad. His mind stored with wit, humour and knowledge of these civilizations and their ways, was a store house of ideas. Added to this, wisdom was his intimate acquaintance with ancient and modern books in different languages. His observing eye makes him compare and contrast different cultures and civilizations for their manners, mores, customs, traditions and peculiarities.

In the words of Addison, the spectator had made himself a speculative statesman, soldier, merchant or artisan without ever meddling with any practical part in life. His classical ideal suggests the value of ancient wisdom for self improvement. The middle class culture and character gets itself exposed and defined in authentic way in the essays of Addison.

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- 8) An animal that has gained new genetic information from the acquisition of foreign DNA is \_\_\_\_\_
- a) Chimera    b) Transgenic Animal  
c) Vector    d) Cosmid
- 9) Ripening of fruits is induced by \_\_\_\_\_ a growth regulator.  
a) Methionine    b) Methylene    c) IBA                  d) Ethylene
- 10) The organism which forms a complex obligatory symbiotic relationship with nitrogen fixing plants is \_\_\_\_\_
- a) Rhizobium    b) Pseudomonas  
c) Aspergillus     d) Nostoc

2. Answer **any five** of the following : **10**
- i) Enzyme Immobilization
  - ii) Interferons
  - iii) Cystic fibrosis
  - iv) Silage fermentation
  - v) Antisense RNA
  - vi) Xanthan gum.
3. A) Answer **any two** of the following : **6**
- i) Describe the method of microbial synthesis of rubber.
  - ii) Explain microbial degradation of xenobiotics.
  - iii) How can the nutritional content of the plant be modified ?
- B) Discuss in detail the process of livestock cloning using nuclear transfer. **4**
4. Answer **any two** of the following : **10**
- i) Give a detailed account on the role and importance of Bacillus thuringiensis in production of insect resistant plants.
  - ii) Give the importance of monoclonal antibodies in the treatment of brain tumors.
  - iii) Describe various approaches of use of nucleic acids as therapeutic agents.
5. Answer **any two** of the following : **10**
- i) Give the significance of nitrogenase gene cluster.
  - ii) Enlist the different types of vaccines with suitable examples.
  - iii) Write a detailed account on gene therapy for genetic disorders.
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**B.Sc. – III (Semester – VI) Examination, 2014**  
**BIOTECHNOLOGY**  
**Animal Development**

Day and Date : Saturday, 12-4-2014  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Rewrite the sentences using correct alternative. 10

- 1) \_\_\_\_\_ is the regional thickening of cells at the anterior end of primitive streak in chick embryo.
  - a) Latebra
  - b) Hensen's node
  - c) Chalaza
  - d) Kolliker's pit
- 2) Egg of chick is
  - a) Alecithal
  - b) Centrolecithal
  - c) Microlecithal
  - d) Megalecithal
- 3) Cell which is able to differentiate into many other cell types is called as
  - a) Nerve cell
  - b) Stem cell
  - c) Glial cell
  - d) Retinal cell
- 4) The process of suicide by cell or group of cells in a multicellular organism is called as
  - a) Mitosis
  - b) Meiosis
  - c) Apoptosis
  - d) Chemotaxis
- 5) A cluster of frog eggs which remain stick together is known as
  - a) blastula
  - b) gastrula
  - c) morula
  - d) spawn



6) \_\_\_\_\_ is a process in which rapid creation of abnormal cells which grow beyond their usual boundaries and invade adjoining parts of the body and spread to other organs.

- a) Vitellogenesis
- b) Meiosis
- c) Metastasis
- d) Cytokinesis

7) Any agent that causes a structural abnormality following fetal exposure during pregnancy is known as

- a) Enteron
- b) Teratogen
- c) Cleavage
- d) Execution

8) The division of an activated egg by a series of mitotic cell division is called

- a) cleavage
- b) apoptosis
- c) fertilization
- d) gametogenesis

9) \_\_\_\_\_ is a syndrome of changes that are deleterious, progressive, universal, irreversible and also include reduction in reproductive capacity.

- a) Aging
- b) Delamination
- c) Archenteron
- d) Cloning

10) A clone is a population of cells which is formed by

- a) Asexually from single ancestor
- b) Sexually from two parents
- c) Asexually from two parents
- d) Fusion of gamets

2. Answer the followings (**any five**) :

10

- 1) What is gametogenesis ?
- 2) Distinguish between spermatogenesis and oogenesis.
- 3) Give significance of fertilization.
- 4) Write any two characters of cancer cell.
- 5) Define stem cell.
- 6) Give significance of Apoptosis.



3. A) Answer the following **(any two)** : **6**
- 1) Describe planes of cleavage.
  - 2) Write an account on transgenic animals.
  - 3) Describe teratogenesis due to drugs.
- B) Define cancer. Write on causes of cancer. **4**
4. Answer the following **(any two)** : **10**
- 1) Describe the process of spermatogenesis in frog.
  - 2) Give an account on theories of ageing.
  - 3) Define metastasis. Describe types of cancer and treatments used in cancer.
5. Answer the following **(any two)** : **10**
- 1) Give an account on transgenic technology with suitable example.
  - 2) Discuss in detail the process of gastrulation in chick.
  - 3) Describe pathways of apoptosis.
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**B.Sc. (Part – I) (Semester – I) Examination, 2014**  
**BIOTECHNOLOGY (Old)**  
**Basic Biotechnology – I**

Day and Date : Friday, 6-6-2014  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Rewrite the following sentences by using the correct alternative given below : **10**

- 1) The term heterosis for first time was coined by \_\_\_\_\_
  - a) G. H. Shell
  - b) Mendel
  - c) Darwin
  - d) Colreuter
- 2) Synthetic seed is produced by encapsulating somatic embryo with \_\_\_\_\_
  - a) Sodium alginate
  - b) Sodium nitrate
  - c) Sodium acetate
  - d) Sodium sulphate
- 3) Triploid plants can be generated from \_\_\_\_\_
  - a) embryo
  - b) endosperm
  - c) pollen
  - d) leaf
- 4) \_\_\_\_\_ is the objective of plant breeding.
  - a) Low productivity
  - b) GM crops
  - c) Higher yield
  - d) Transgenic plants
- 5) Anther culture was first performed in \_\_\_\_\_
  - a) Capsella
  - b) Sunflower
  - c) Oil palm
  - d) Datura



- 6) Regeneration of somatic embryo is generally induced by \_\_\_\_\_
- a) low concentration of 2, 4 – D      b) high concentration of 2, 4 – D  
c) low concentration of BAP              d) high concentration of BAP
- 7) In plants, embryo rescue is adopted for overcoming \_\_\_\_\_
- a) Histocompatibilities  
b) Prezygotic fertilization barrier  
c) Culture induced chromosomal abnormalities  
d) Postzygotic fertilization barrier
- 8) Induction of polyploidy by colchicine was first discovered by \_\_\_\_\_
- a) Blackeslee                                      b) Mendel  
c) S. J. Swaminathan                          d) Albert Howard
- 9) Ability of a plant cell to develop into a whole plant is called as \_\_\_\_\_
- a) regeneration                                      b) organogenesis  
c) totipotency                                        d) Pleuripotency
- 10) \_\_\_\_\_ is a plant breeder, approaching the problems of cultivated plant species in terms of diversity.
- a) Hammer                                        b) Vavilor  
c) Hawkes    d) McCorriston

2. Answer **any five** :

10

- 1) Genetic variability
- 2) Differentiation
- 3) Synthetic seed
- 4) Triploids
- 5) Embryo culture
- 6) Genes.



3. A) Answer **any two** : **6**
- 1) Heterosis
  - 2) Pollen culture
  - 3) Somatic embryos.
- B) Explain the method of production of haploid plants. **4**
4. Answer **any two** : **10**
- 1) Explain the method of organogenesis.
  - 2) Describe the methods of reproduction in self pollinated crop plants.
  - 3) What is somatic embryogenesis ? Add a note on induction of somatic embryo.
5. Answer **any two** : **10**
- 1) Describe the factor affecting seed setting after invitro pollination.
  - 2) Write a note on ethics of biotechnology.
  - 3) Explain the expression of non-embryonic genes.
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**B.Sc. – III (Semester – VI) Examination, 2014**  
**BIOTECHNOLOGY**  
**Nanobiotechnology**

Day and Date : Tuesday, 15-4-2014  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Rewrite the following sentence by choosing the correct alternative. **10**
- 1) Electron beam lithography requires \_\_\_\_\_  
a)  $\sim 10^{-5}$  torr vacuum                      b) CO<sub>2</sub> gas  
c) 1 atm H<sub>2</sub> gas pressure                      d) Mixed air
  - 2) E-beam lithography is used to \_\_\_\_\_  
a) Analysis of nanostructure                      b) Make nanostructure  
c) Detect nanostructure                      d) Measure nanostructure
  - 3) Use of plant extract for synthesis of nanoparticles is \_\_\_\_\_ method.  
a) Physical              b) Chemical              c) Biological              d) Mechanical
  - 4) When atoms are brought together in a fixed structure they form \_\_\_\_\_  
a) Mixture              b) Molecule              c) Alloy              d) Biosystem
  - 5) For measurement of nanostructure \_\_\_\_\_ is used.  
a) Lithography                      b) Microemulsion  
c) Colloids                      d) TEM
  - 6) In UV-Vis-NIR spectroscopy the range of wavelength of light used is \_\_\_\_\_  
a)  $\sim 200$  nm to  $\sim 400$  nm                      b)  $\sim 400$  nm to  $\sim 700$  nm  
c)  $\sim 400$  nm to  $\sim 3000$  nm                      d)  $\sim 200$  nm to  $\sim 3000$  nm
  - 7) In \_\_\_\_\_ atoms and molecules are removed from bulk material to attain required size and shape of nanomaterials.  
a) Top down approach                      b) Top up approach  
c) Bottom up approach                      d) Bottom down approach



- 8) A device giving a signal for the detection or measurement of a physical (chemical) property to which it respond is called \_\_\_\_\_  
a) Motor                      b) Polymer                      c) Sensor                      d) Drug
- 9) The current (I) flowing through circuit across the voltage applied (V) with a resistance of material (R), then the relationship  $V = IR$  is given by \_\_\_\_\_  
a) Faraday's law                      b) Ohm's law  
c) Thermodynamics law                      d) Coulomb's law
- 10) In scanning electron microscope \_\_\_\_\_ electrons are detected.  
a) Backscattered                      b) Transmitted  
c) Secondary                      d) Both a) and c)

2. Answer **any five** of the following : **10**
- a) What is Coulomb's law ?
  - b) Give time independent Schrödinger equation in three dimensions.
  - c) Which materials are used for nanotechnology ? One example each.
  - d) Enlist the different spectroscopic techniques used in analysis of nanomaterials.
  - e) What are colloids ?
  - f) Draw neat labelled ray diagram of simplest optical microscope.
3. A) Answer **any two** of the following : **6**
- a) Write a note on quantum theory.
  - b) Give the structural properties of nanomaterials.
  - c) Explain synthesis of nanoparticles using plant extract.
- B) Explain synthesis of colloids with suitable diagram. **4**
4. Answer **any two** of the following : **10**
- a) Explain the lithography tool for making nanostructure.
  - b) Explain principle, working and application of Transmission Electron Microscope (TEM) with suitable diagram.
  - c) Explain in detail microemulsion method for synthesis of nanoparticles.
5. Answer **any two** of the following : **10**
- a) Describe in detail sensors.
  - b) Write a note on electrical conductivity of nanoparticles.
  - c) Give application of nanoparticles in human health.
-



Seat No.	
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**B.Sc. – I (Semester – I) Examination, 2014  
BIOTECHNOLOGY (Old)  
Basic of Tissue Culture – I**

Day and Date : Saturday, 7-6-2014

Max. Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

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

1. Rewrite the following sentences by using correct alternative : **10**

- 1) Which of the following plant cell show totipotency ?
  - a) Xylem vessel
  - b) Sieve tube
  - c) Meristem
  - d) Cork cells
- 2) To obtain triploid plant we culture
  - a) Nucleus
  - b) Anther
  - c) Endosperm
  - d) Embryo
- 3) \_\_\_\_\_ hormone is used to obtain roots in tissue culture.
  - a) Auxin
  - b) Cytokinin
  - c) Gibberellin
  - d) Ethylene
- 4) In animal cell culture, the addition of serum to media is essential for providing\_\_\_\_\_
  - a) Amino acids for protein synthesis
  - b) Nucleotides for DNA synthesis
  - c) Growth factors
  - d) All of these



- 5) To promote attachment and spreading of anchorage dependent animal cells, the surface of the culture vessel needs to be coated with
- a) Trypsin
  - b) Cellogen
  - c) Pronase
  - d) Polyglycol
- 6) In animal cell culture hormone FGF stands for
- a) Filamentous growth factor
  - b) Fibroblast growth factor
  - c) Fibronectin growth factor
  - d) Fetuin growth factor
- 7) Monoclonal antibodies are produced by
- a) Invivo method
  - b) Suspended cell culture in fermentor
  - c) Mobilized cell reactors
  - d) All of these
- 8) The major hazards of monoclonal antibodies are
- a) .Difficult in purification
  - b) Contamination with retroviral particles from mouse myeloma cells
  - c) Non specificity
  - d) All of these
- 9) Which of these would not be used to introduce DNA in animal cells ?
- a) Liposomes
  - b) Electroporation
  - c) Microinjection
  - d) T<sub>1</sub> plasmid
- 10) Anchorage dependent means
- a) Attachment to the substrate
  - b) Attachment to cell
  - c) Attachment to nutrients
  - d) Attachment to nucleus



2. Attempt **any five** of the following : **10**
- 1) What is embryo ?
  - 2) Define cloning.
  - 3) Viability.
  - 4) Use of cell culture.
  - 5) Define callus.
  - 6) Define hybrids.
3. a) Attempt **any two** of the following : **6**
- 1) Give an account on cytodifferentiation.
  - 2) Explain suspension culture.
  - 3) What is cell transformation ?
- b) Explain embryo transplant technique. **4**
4. Answer **any two** of the following : **10**
- 1) Explain the method of production of novel plants.
  - 2) Illustrate the preparation of plant tissue culture media.
  - 3) Explain measurement of cell viability.
5. Answer **any two** of the following : **10**
- 1) Explain production of monoclonal antibodies.
  - 2) Describe invitro fertilization.
  - 3) Explain method of developing transgenic animal.
-





SLR-D – 6

Seat No.	
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**B.Sc. – I (Semester – I) Examination, 2014**  
**BIOTECHNOLOGY**  
**Microbiology – I (Old)**

Day and Date : Monday, 9-6-2014  
Time : 3.00 p.m. to 5.00 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 selecting correct answer from given alternatives : 10
- 1) In gram negative bacteria, the flagellum is attached to the cytoplasmic membrane by the rings \_\_\_\_\_
    - a) S ring only
    - b) S and M rings
    - c) P ring
    - d) P and L rings
  - 2) \_\_\_\_\_ discovered bacteria.
    - a) Leeuwenhoek
    - b) Lederberg
    - c) Wolkman and Zinder
    - d) Von Dusch
  - 3) Bacteria differ from plants in that they do not have \_\_\_\_\_
    - a) DNA
    - b) RNA
    - c) Cell wall
    - d) A well defined nucleus
  - 4) When a pair of spherical bacteria is present together it is called \_\_\_\_\_
    - a) Streptococcus
    - b) Micrococcus
    - c) Diplococcus
    - d) Sarcina
  - 5) Mac Conkey's agar is an example of \_\_\_\_\_
    - a) Living media
    - b) Enriched media
    - c) Enrichment media
    - d) Selective and differential media
  - 6) HeLa cell line is an example of \_\_\_\_\_
    - a) Continuous cell line
    - b) Primary cell culture
    - c) Diploid cell culture
    - d) None of the above

P.T.O.



- 7) The type of ribosome present in a prokaryotic cell is \_\_\_\_\_  
a) 25 S                      b) 70 S                      c) 80 S                      d) 60 S
- 8) Germ theory of disease was given by \_\_\_\_\_  
a) Robert Koch                      b) Louis Pasteur  
c) A. V. Leeuwenhoek                      d) L. J. Stadler
- 9) An increase in the \_\_\_\_\_ is observed during lag phase of growth.  
a) Cell No.                      b) Cell size                      c) Cell mass                      d) Growth rate
- 10) In turbidostat \_\_\_\_\_ is kept as a predetermined value.  
a) Growth rate                      b) Dilution rate  
c) Turbidity                      d) Cell mass

2. Answer **any five** of the following : **10**
- 1) Define – isolation.
  - 2) Define – continuous culture.
  - 3) Enlist the functions of capsule.
  - 4) Enlist the various types of cytoplasmic inclusions.
  - 5) Define – Fungi.
  - 6) Define – geomicrobiology.
3. A) Answer **any two** of the following : **6**
- 1) Enlist the differences between capsule and slime layer.
  - 2) Draw a neat labelled diagram of prokaryotic cell.
  - 3) Write a note on chemoheterotrophs.
- B) Define – pure culture. Explain the various methods of selection of pure culture. **4**
4. Write short notes on **any 2** : **10**
- 1) Contributions in development of microscope
  - 2) Laboratory methods of determination of growth
  - 3) Structure of Gram negative bacterial cell wall.
5. Write short notes on **any 2** : **10**
- 1) Reserve food materials
  - 2) Streak plate method
  - 3) Living media.
-



SLR-D – 7

Seat No.	
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**B.Sc. – I (Sem. – I) Examination, 2014**  
**BIOTECHNOLOGY**  
**Ecology – I (Old)**

Day and Date : Tuesday, 10-6-2014  
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Rewrite the following sentences by choosing correct alternatives given below : **10**

- i) The part of earth's atmosphere that shields earth from harmful ultraviolet radiations is called as \_\_\_\_\_  
a) Equatorial bulge                      b) Ionic layer  
c) Ozone layer                              d) Protective layer
- ii) An ecosystem must have continuous external source of \_\_\_\_\_  
a) Mineral              b) Energy              c) Food              d) None of these
- iii) \_\_\_\_\_ is the leading person for the Narmada Bachao Andolan.  
a) Medha Patkar                              b) Arundhati Roy  
c) Salim Ali                                      d) Sunderlal Bahuguna
- iv) Conservation within the natural habitat is \_\_\_\_\_ conservation.  
a) In situ              b) Ex situ              c) In vitro              d) Ex vitro
- v) From the following the correct statements for secondary succession is that \_\_\_\_\_  
a) It is similar to primary succession that it has a relatively fast pace  
b) It begins on a bare rock  
c) It occurs on a deforested site  
d) It follows primary succession

P.T.O.



- vi) Biodiversity is valuable and desirable to humans for \_\_\_\_\_
- a) Medicinal purpose                      b) Agricultural diversity  
c) Consumptive use                      d) All of these purpose
- vii) \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_ are the three states of water on earth.
- a) Ground water, lakes, clouds  
b) Liquid water, frozen water, water vapor  
c) Gas, steam, vapor  
d) Ground water, oceans, ice
- viii) Water is \_\_\_\_\_ resource.
- a) Non-renewable                      b) Biotic  
c) Non-essential                      d) Abiotic
- ix) The zone of penetration of light from the surface to the compensation point is known as \_\_\_\_\_
- a) Limenetic zone                      b) Profundal zone  
c) Littoral zone                      d) Both b) and c)
- x) \_\_\_\_\_ processes plays an important role in the phosphorus cycle.
- a) Combustion                      b) Erosion  
c) Fixation                      d) Cellular respiration

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

10

- i) Describe the term lithosphere.  
ii) Explain the degradation of natural resources.  
iii) What is ecological succession ?  
iv) Explain the term hot spots.  
v) Discuss about scared groove.  
vi) What are the sedimentary cycles ?

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

6

- i) Write a note on biodiversity in India.  
ii) Distinguish between In situ conservation and Ex-situ conservation.  
iii) Discuss about freshwater ecosystem.

B) Explain the conservation methods of biodiversity with respect to genetic conservation and wet land conservation.

4



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

10

- i) Explain concept and structure of ecosystem.
- ii) What is biogeochemical cycle ? Explain nitrogen cycle with suitable diagram.
- iii) Discuss the types of biodiversity. Give its importance.

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

10

- i) Describe various layers of atmosphere with suitable diagram.
  - ii) Give an account on Chipko Andolan and Silent Valley Movement.
  - iii) What are natural resources ? Explain water as a natural resource.
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Seat No.	
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**B.Sc. (Part – I) (Biotechnology) (Semester – I) Examination, 2014**  
**BIOMETRY – I (Old)**

Day and Date : Wednesday, 11-6-2014

Max. Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

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

1. Multiple choice questions :

10

1) If  $A = \begin{bmatrix} 2 & -1 \\ 0 & 1 \end{bmatrix}$  then  $A' =$  \_\_\_\_\_

a)  $\begin{bmatrix} -1 & 2 \\ 1 & 0 \end{bmatrix}$

b)  $\begin{bmatrix} 2 & 0 \\ -1 & 1 \end{bmatrix}$

c)  $\begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix}$

d)  $\begin{bmatrix} 0 & 1 \\ 2 & -1 \end{bmatrix}$

2) A square matrix A is invertible iff \_\_\_\_\_

a)  $|A| \neq 0$

b)  $|A| = 0$

c)  $|A| = 1$

d) None of these

3) If u and v are differentiable functions of x then  $\frac{d}{dx}(u+v) =$  \_\_\_\_\_

a)  $u \frac{dv}{dx} + v \frac{du}{dx}$

b)  $\frac{du}{dx} + \frac{dv}{dx}$

c)  $\frac{du}{dx} \pm \frac{dv}{dx}$

d)  $\frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$

4) If A and B are two sets, the intersection is denoted by  $A \cap B$  and is defined as  $A \cap B =$  \_\_\_\_\_

a)  $\{x/x \in A \text{ and/or } x \in B\}$

b)  $\{x/x \in A \text{ or } x \in B\}$

c)  $\{x/x \in A \text{ and } x \in B\}$

d) None of these



5) If  $U = \{x / x \leq 5, x \in \mathbb{N}\}$

$A = \{1, 2\}$        $B = \{3, 4\}$        $C = \{1, 3\}$

Then  $(A \cup B) \cap C =$  \_\_\_\_\_

- a)  $\{1, 2, 3\}$       b)  $\{1, 2, 3, 4\}$       c)  $\{1, 3\}$       d)  $\{1, 2\}$

6)  $\frac{d}{dx} (\cot x) =$  \_\_\_\_\_

- a)  $\sec^2 x$       b)  $-\operatorname{cosec}^2 x$   
 c)  $\sec x \tan x$       d)  $-\operatorname{cosec} x \cdot \cot x$

7) If  $f(x, y) = 2x^2 + 4xy - y^2$

$\frac{\partial f}{\partial x}$  at  $(1, 2)$  is \_\_\_\_\_

- a) 9      b) 12      c) 6      d) - 8

8) The differential equation  $Mdx + Ndy = 0$  is exact iff \_\_\_\_\_ the condition is satisfied.

- a)  $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$       b)  $\frac{\partial M}{\partial y} \neq \frac{\partial N}{\partial x}$       c)  $\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y}$       d) None of these

9) If  $f(x) = \sqrt{x}$  then  $f'(x) =$  \_\_\_\_\_

- a)  $\frac{1}{2\sqrt{x}}$       b)  $\sqrt{x}$       c)  $2\sqrt{x}$       d)  $-\frac{1}{\sqrt{x}}$

10) The value of  $\sin^2 \theta + \cos^2 \theta =$  \_\_\_\_\_

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

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

**10**

1) Determine the nature of roots of following equation :

$$x^2 + x + 1 = 0$$

2) Find the modulus and argument of the following complex numbers and express it in polar form  $z = 1 + i$ .



3) Evaluate  $\int \left( 4^x - e^{-x} + \frac{4}{1+x^2} \right) dx$ .

4) Given  $f(x) = 2x^3 - 21x^2 + 72x + 17$

Find the values of  $x$  at which  $f'(x) = 0$

5) Evaluate  $\lim_{x \rightarrow 3} \frac{5x^2 - 15x}{x - 3}$

6) Write Demorgan's law and associative law.

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

6

1) Find two numbers whose G. M. is 6 and their H. M. is  $\frac{72}{13}$ .

2) If  $f(x) = x^2 - 2x + 3$ . Find the values of  $x$  for which  $f(x) = f(x + 1)$ .

3) If  $A = \begin{bmatrix} 1 & -2 & 3 \\ -4 & 2 & 5 \end{bmatrix}$   $B = \begin{bmatrix} 2 & 3 \\ 4 & 5 \\ 2 & 2 \end{bmatrix}$

Find  $AB$  and  $BA$

Is  $AB = BA$  ?

B) Solve the following system :

4

$$x + 2y - 2z = 1$$

$$-x + 3y = -1$$

$$-2y + z = 2$$





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

10

- 1) A body cools from  $80^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  in the room temperature of  $25^{\circ}\text{C}$  in 30 minutes.  
Find the temperature of a body after 1 hour.
- 2) Find the stationary points and determine the nature of the given function at those points.

$$f(x, y) = x^2 + 3y^2 + 2xy + 2x + 10y + 9$$

- 3) Solve  $\frac{dy}{dx} + \frac{10y}{2x+5} = 10$  given that  $y = 0$  if  $x = 0$ .

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

10

- 1) Investigate the values of  $\lambda$  and  $\mu$  so that the equations

$$2x + 3y + 5z = 9$$

$$7x + 3y - 2z = 8$$

$$2x + 3y + \lambda z = \mu$$

have

- i) No solutions
- ii) A unique solutions
- iii) An infinite number of solutions

- 2) Show that  $\frac{(\cos 3\theta + i \sin 3\theta)^5 (\cos \theta - i \sin \theta)^3}{(\cos 5\theta + i \sin 5\theta)^7 (\cos 2\theta - i \sin 2\theta)^5} = \cos 13\theta - i \sin 13\theta$

- 3) If  $U = \log(x - 2y)$  then show that  $\frac{\partial^2 u}{\partial x \partial y} = \frac{\partial^2 u}{\partial y \partial x}$ .

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**B.Sc. (Part – I) (Sem. – I) Examination, 2014  
BIOTECHNOLOGY (Old)  
Computers – I**

Day and Date : Thursday, 12-6-2014  
Time : 3.00 p.m. to 5.00 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 correct answer from given alternatives. **10**

- i) The most widely used operating system is \_\_\_\_\_
  - a) Unix
  - b) Windows
  - c) DOS
  - d) None
- ii) To copy, the short cut key is \_\_\_\_\_
  - a) Ctrl + X
  - b) Ctrl + V
  - c) Ctrl + C
  - d) Ctrl + S
- iii) For database management system \_\_\_\_\_ package is used.
  - a) MS Word
  - b) MS Excel
  - c) MS PowerPoint
  - d) MS Access
- iv) \_\_\_\_\_ is a pictorial representation of a logic of a program.
  - a) Flow chart
  - b) Chart
  - c) Pseudo code
  - d) Picture code
- v) The time required for read write head to move to correct track is \_\_\_\_\_
  - a) Latency time
  - b) Rotational delay
  - c) Seek time
  - d) None
- vi) Operating system is a \_\_\_\_\_
  - a) Hardware
  - b) Software
  - c) Input device
  - d) Output device



- vii) CD-ROM stands for \_\_\_\_\_
- a) Compact disc read only memory      b) Compact data read only memory  
c) Compressed disc read only memory    d) Compact disc rotation only memory
- viii) The capacity of floppy disk is \_\_\_\_\_
- a) 1.5 MB      b) 1.44 MB  
c) 700 MB      d) 4.7 GB
- ix) In access, the default table name is \_\_\_\_\_
- a) Table 1      b) Tb1  
c) Database 1      d) Query 1
- x) \_\_\_\_\_ is a step by step instructions which are written for solving a problem.
- a) Algorithm      b) Flow chart  
c) Chart      d) Picture code

2. Answer **any five** of the following : **10**
- i) Enlist the output devices.
  - ii) Explain Application software with example.
  - iii) Explain any two services of operating systems.
  - iv) How will you open word document ?
  - v) Define the following terms :
    - a) Computer      b) Operating System.
  - vi) Write an algorithm to display larger no between given two no's.
3. A) Answer **any two** of the following : **6**
- i) What is user-interface ? Explain its types.
  - ii) Write a note on "virus".
  - iii) How will you do cut, copy and paste operations in word document ?
- B) What is computer ? Explain different parts of computer. **4**
4. Answer **any two** of the following : **10**
- i) Explain creation of form using wizards in MS Access.
  - ii) Explain memory unit with its types.
  - iii) How will you apply custom animation effects in power point presentation ?
5. Answer **any two** of the following : **10**
- i) Explain fixed partition memory management system.
  - ii) Explain the first generation of computers.
  - iii) Write a note on "Information Management".
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Seat No.	
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**B.Sc. – I (Semester – I) (New) Examination, 2014**  
**Biotechnology**  
**ECOLOGY AND MICROBIOLOGY**  
**Paper – I : Ecology**

Day and Date : Wednesday, 4-6-2014  
Time : 3.00 p.m. to 5.00 p.m.

Total Marks : 50

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

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

10

- 1) The ozone gas is present in \_\_\_\_\_
  - a) Mesosphere
  - b) Stratosphere
  - c) Troposphere
  - d) Thermosphere
  
- 2) The layer of water on the surface of earth is called \_\_\_\_\_
  - a) Hydrosphere
  - b) Lithosphere
  - c) Biosphere
  - d) Atmosphere
  
- 3) The food chain starts from green plants goes through herbivores and ends in the carnivores are called \_\_\_\_\_ food chain.
  - a) Detritus
  - b) Grazing
  - c) Parasitic
  - d) Predator
  
- 4) Medha Patkar is related to \_\_\_\_\_
  - a) Chipko andolan
  - b) Conservation of western ghat
  - c) Narmada bachao andolan
  - d) Silent valley
  
- 5) When succession start in water, then it is called \_\_\_\_\_
  - a) Xerach
  - b) Hydrosere
  - c) Mesarch
  - d) All of the above

P.T.O.



- 6) In ecosystem plants are also called \_\_\_\_\_
- a) Transducer
  - b) Consumer
  - c) Decomposer
  - d) Reducer
- 7) \_\_\_\_\_ is a group of similar plants or animals living in an area.
- a) Species
  - b) Community
  - c) Population
  - d) Pioneer
- 8) In desert ecosystem \_\_\_\_\_ is main producer.
- a) Herbs
  - b) Pine trees
  - c) Cactus
  - d) Grass
- 9) The first group of organism which initiate ecological succession is called \_\_\_\_\_ community.
- a) Pioneer
  - b) Secondary
  - c) Climax
  - d) Polyclimax
- 10) Sanctuaries are established to \_\_\_\_\_
- a) Rear animals for milk
  - b) Entrap animals
  - c) Protect animal
  - d) None of the above

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

10

- i) Draw food web of aquatic ecosystem.
- ii) Give the distribution of water present on earth.
- iii) Write down functions of ecosystem.
- iv) Enlist the importance of biodiversity.
- v) Give the gaseous composition of atmosphere.
- vi) Write in short about project tiger.



3. A) Answer **any two** of the following : **6**
- i) Explain in detail about nitrogen cycle.
  - ii) Write down productivity of terrestrial ecosystem.
  - iii) Explain desert ecosystem.
- B) Explain ecological pyramids with reference to forest ecosystem. **4**
4. Answer **any two** of the following : **10**
- i) Write down in detail about the types of ecological succession.
  - ii) Explain mineral resources.
  - iii) Which are threats to biodiversity ?
5. Answer **any two** of the following : **10**
- i) Explain components of environment.
  - ii) What are different types of forest ?
  - iii) Explain in brief role of national park in wildlife protection.
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Seat No.	
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**B.Sc. – I Biotechnology (Semester – I) (New) Examination, 2014  
ECOLOGY AND MICROBIOLOGY (Paper – II)  
Microbiology**

Day and Date : Thursday, 5-6-2014

Total Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

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

1. Rewrite the sentences using **correct** alternatives given below : **10**

- 1) The technique of antiseptic surgery was introduced by \_\_\_\_\_
  - a) Robert Koch
  - b) Louis Pasteur
  - c) Joseph Lister
  - d) Antony Van Leeuwenhoek
- 2) Robert Koch discovered \_\_\_\_\_ causative agent of tuberculosis.
  - a) Mycobacterium tuberculosis
  - b) Mycobacterium leprae
  - c) Vibrio cholerae
  - d) E. coli
- 3) Prokaryotic cell of bacteria has \_\_\_\_\_ ribosome.
  - a) 60 s
  - b) 70 s
  - c) 80 s
  - d) 100 s
- 4) Glycon strand of Gram Positive bacterial cell wall has \_\_\_\_\_ linkages.
  - a)  $\beta$ -1, 4 glycosidic
  - b)  $\alpha$ -1, 4 glycosidic
  - c)  $\beta$ -1, 6 glycosidic
  - d)  $\alpha$ -1, 6 glycosidic
- 5) Protein subunit of viral capsid is called as \_\_\_\_\_
  - a) Monomer
  - b) Polymer
  - c) Capsomer
  - d) Envelope
- 6) Mesosome is the invasion of \_\_\_\_\_
  - a) Cell wall
  - b) Capsule
  - c) Cell membrane
  - d) Flagella
- 7) \_\_\_\_\_ is selective media used for cultivation of fungi.
  - a) Sabouraud's agar
  - b) Mac Conkey's agar
  - c) Milk agar
  - d) Blood agar



- 8) Actinomycetes are example of \_\_\_\_\_ bacteria.
- |                  |              |
|------------------|--------------|
| a) Gram positive | b) Acid fast |
| c) Gram negative | d) Complex   |
- 9) Maneval's method is commonly used to detect \_\_\_\_\_
- |              |                  |
|--------------|------------------|
| a) Cell wall | b) Cell membrane |
| c) Capsule   | d) Flagella      |
- 10) \_\_\_\_\_ example of thermophilic bacteria.
- |                             |                      |
|-----------------------------|----------------------|
| a) <u>Thermus aquaticus</u> | b) <u>Halococcus</u> |
| c) <u>Thiobacillus</u>      | d) <u>E. coli</u>    |

2. Answer **any five** of the following : 10
- i) Define and explain Medical Microbiology.
  - ii) Define virology and give two examples of viruses.
  - iii) Define Capsomer.
  - iv) Explain harmful activities of Microbes.
  - v) Define prokaryotes and give its two characters.
  - vi) Define capsule and slime layer.
3. A) Answer **any two** of the following : 6
- i) Explain capsid symmetry in viruses.
  - ii) Write on contribution of Louis Pasteur in Microbiology.
  - iii) Explain the function of cell membrane in bacteria.
- B) Explain the structure and function of Gram Positive bacterial cell wall. 4
4. Answer **any two** of the following : 10
- i) Elaborate contributions of Robert Koch.
  - ii) Explain the structure and function of spore in bacteria.
  - iii) Explain the general characters of fungi and enlist its three examples.
5. Answer **any two** of the following : 10
- i) Explain the arrangement of flagella in bacteria and give its example.
  - ii) Explain the difference between Prokaryotes and Eukaryotes.
  - iii) Explain the characteristics of algae and give its two examples.
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**B.Sc. – I (Semester – I) (New) Examination, 2014**  
**Biotechnology**  
**INTRODUCTION TO BIOSCIENCES (Paper – I)**  
**Plant Sciences**

Day and Date : Friday, 6-6-2014  
Time : 3.00 p.m. to 5.00 p.m.

Total Marks : 50

- N. B. :** 1) *All questions are compulsory.*  
2) *Figures in **right** indicate **full** marks.*  
3) *Draw **neat and labelled** diagram **wherever** necessary.*

1. Rewrite the following sentence by choosing **correct** alternative : **10**

- 1) Sieve tubes and companion cells occur in \_\_\_\_\_  
a) Xylem  
b) Phloem  
c) Ground tissue  
d) Vascular bundle
- 2) Aerenchyma are present in \_\_\_\_\_  
a) Aquatic plants  
b) Mesophyte  
c) Xerophyte  
d) None
- 3) Vascular bundles of monocot stem are \_\_\_\_\_  
a) Bicollateral  
b) Collateral  
c) Radial  
d) Leptocentric
- 4) Periderm is derived from \_\_\_\_\_  
a) Phellogen  
b) Fasicular cambium  
c) Vascular cambium  
d) Cork cells
- 5) \_\_\_\_\_ hormone induces flowering in process of vernalization.  
a) Florigen  
b) Florin  
c) Vernalin  
d) Glucogen



- 6) Branch of botany which deals with study of algae is called as \_\_\_\_\_
- a) Phycology
  - b) Mycology
  - c) Physiology
  - d) None
- 7) \_\_\_\_\_ cells have the ability of continuous cell division.
- a) Epidermis
  - b) Collenchyma
  - c) Meristem
  - d) Chlorenchyma
- 8) Transfer of pollengrains from anther towards stigma of another flower of same plant called as \_\_\_\_\_
- a) Self pollination
  - b) Cross pollination
  - c) Genitogamy
  - d) Ornathophily
- 9) Formation of fruit without seed formation is called as \_\_\_\_\_
- a) Vernalization
  - b) Photoperiodism
  - c) Parthenocarpy
  - d) None
- 10) Presence of \_\_\_\_\_ is an important condition for flower initiation.
- a) Soil
  - b) Water
  - c) Root
  - d) Leaf

2. Answer **any 5** of the following :

**10**

- 1) Parthenocarpy
- 2) Simple tissue
- 3) General characteristics of algae
- 4) Methods of breaking seed dormancy
- 5) Typical flower
- 6) Role of GA.



3. A) Answer **any 2** of the following : **6**
- 1) Describe in detail objectives of taxonomy.
  - 2) Describe in detail development of female gametophyte in angiosperm.
  - 3) Write a note on significance of binomial nomenclature.
- B) Describe the important economic importance of algae. **4**
4. Answer **any 2** of the following : **10**
- 1) Describe the primary structure of dicot leaf.
  - 2) Describe in detail practical applications of ethylene.
  - 3) State the economic importance of lichens.
5. Answer **any 2** of following : **10**
- 1) Describe in detail continuances to active cross pollination.
  - 2) Types of fruits.
  - 3) Define growth and explain the phases of growth.
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**B.Sc. – I Biotechnology (Semester – I) (New) Examination, 2014**  
**INTRODUCTION TO BIOSCIENCES**  
**Paper – II : Animal Science**

Day and Date : Saturday, 7-6-2014

Total Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

**N.B. :** 1) **All questions are compulsory.**

2) **Figures to the right indicate full marks.**

3) **Draw neat labelled diagram wherever necessary.**

1. Rewrite the sentences using **correct** alternative given below :

**10**

- 1) Paramecium belongs to phylum \_\_\_\_\_
  - a) Porifera
  - b) Echinodermata
  - c) Protozoa
  - d) Arthropoda
- 2) \_\_\_\_\_ is an example of phylum Echinodermata.
  - a) Sea star
  - b) Cockroach
  - c) Leech
  - d) Earthworm
- 3) Jointed appendages is a salient feature of \_\_\_\_\_
  - a) Lizard
  - b) Labeo
  - c) Beetle
  - d) Sea cucumber
- 4) Frog belongs to class \_\_\_\_\_
  - a) Reptiles
  - b) Aves
  - c) Mammals
  - d) Amphibia
- 5) Placoid scales are present on body surface of \_\_\_\_\_
  - a) Reptiles
  - b) Bony fishes
  - c) Cartilaginous fishes
  - d) Lizard
- 6) Pneumatic bones are salient feature of \_\_\_\_\_
  - a) Birds
  - b) Reptiles
  - c) Amphibia
  - d) Mammals
- 7) Malaria is caused by \_\_\_\_\_
  - a) Plasmodium
  - b) Paramecium
  - c) HIV
  - d) Mosquito



- 8) *Ascaris* is responsible for causing \_\_\_\_\_ disease in humans.  
 a) Dysentery  
 b) Malaria  
 c) Ascariasis  
 d) Filariasis
- 9) Rearing of honey bee for production of honey and wax is called \_\_\_\_\_.  
 a) Vermiculture  
 b) Apiculture  
 c) Sericulture  
 d) Aquaculture
- 10) \_\_\_\_\_ is a host plant of *Bombyx mori*.  
 a) Oak  
 b) Machilus  
 c) Strawberry  
 d) Mulberry

2. Answer **any five** of the following : 10
- 1) Define Coelom.
  - 2) Viviparous animals.
  - 3) Chondrichthyes fishes.
  - 4) Enlist species of silkworms.
  - 5) Enlist protozoan parasites.
  - 6) Enlist tools required for Apiculture.
3. A) Answer **any two** of the following : 6
- i) General characters of class Insecta.
  - ii) Explain salient features of class Amphibia.
  - iii) Write a note on Nematode parasites.
- B) Explain economic importance of Apiculture. 4
4. Answer **any two** of the following : 10
- i) Explain general characters of phylum Echinodermata with suitable example.
  - ii) Describe general characters of class Mammalia.
  - iii) Describe life cycle of *plasmodium vivax* in humans.
5. Answer **any two** of the following : 10
- i) Write a note on Vermiculture.
  - ii) General characters of Aves with suitable example.
  - iii) Explain different principles of classification with suitable examples.



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**B.Sc. – I (Semester – I) (New) Examination, 2014**  
**BIOTECHNOLOGY**  
**Fundamentals of Chemistry and Biophysics**  
**Paper – I : Chemical Science**

Day and Date : Monday, 9-6-2014  
Time : 3.00 p.m. to 5.00 p.m.

Total Marks : 50

- N.B. :** 1) *All questions are compulsory.*  
2) Draw *neat* diagram and give equations *wherever* necessary.  
3) Figures to *right* indicate *full* marks.  
4) *Use* of log tables, calculator is *allowed*.

1. Select the **correct** alternative from the following and rewrite the sentences. **10**

1) Internal energy is denoted by \_\_\_\_\_

- a) E                                      b) U                                      c) I                                      d) H

2) If the pH of solution is less than 7 then the nature of solution is \_\_\_\_\_

- a) Acidic                                      b) Basic  
c) Neutral                                      d) None of these

3) In reaction  $2A + B \rightarrow C + 3D$  the molecularity of reaction is \_\_\_\_\_

- a) 0                                      b) 1                                      c) 2                                      d) 3

4) The value of constant in Nernst equation

$$E = E^{\circ} - \frac{\text{constant}}{n} \log_{10} \frac{[\text{Product}]}{[\text{Reactant}]} \text{ is } \underline{\hspace{2cm}}$$

- a) 0.0592 mV                                      b) 0.0592 V  
c) 25.7 mV                                      d) 0.0296 V





10) Strength of covalent bond depends on \_\_\_\_\_

- a) Extent of overlap of atomic orbitals
- b) Number of electrons
- c) Types of orbitals
- d) Type of hybridisation

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

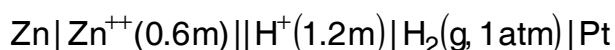
10

- 1) What is salt bridge, give it's functions ?
- 2) The hydrogen ion concentration of fruit juice is  $3 \times 10^{-2}$  m, what is the pH of fruit juice ?
- 3) Give any two statements of second law of thermodynamics.
- 4) Define hybridisation, mention its types.
- 5) Define hydrogen bonding give one example involving inter molecular hydrogen bonding.
- 6) Mention type of chemical bond present in following molecules  
NaCl, KCl, CH<sub>4</sub>, Cl<sub>2</sub>.

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

6

- 1) Explain the term reverse osmosis with the help of diagram.
- 2) Calculate potential of cell at 25° .



Where  $E^\circ_{\text{zn}} = -0.763\text{V}$  .

- 3) Distinguish between ionic bond and covalent bond.

B) A first order reaction takes 15 minutes to complete 25% reaction how much it will take to complete 50% reaction.

4





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

**10**

- 1) Derive the expression for integrated rate law for the first order reaction.  
Give it's units.
- 2) What is standard molar entropy what are its uses ?
- 3) Define and explain the terms
  - a) Bond length
  - b) Bond angle
  - c) Bond energy
  - d) Shape of molecule

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

**10**

- 1) Describe the construction and working of calomel electrode.
  - 2) What are buffers ? Derive the Henderson equation for acidic buffers.
  - 3) What are general characteristics of ionic compounds ?
-



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**B.Sc. – I (Semester – I) Biotechnology (New) Examination, 2014**  
**Fundamentals of Chemistry and Biophysics**  
**BIOPHYSICS (Paper – II)**

Day and Date : Tuesday, 10-6-2014  
Time : 3.00 p.m. to 5.00 p.m.

Total Marks : 50

- N.B.*** 1) ***All questions are compulsory.***  
2) ***Figures to the right indicate full marks.***  
3) ***Draw neat diagrams wherever necessary.***  
4) ***Use of logarithmic table is allowed.***

1. Select **correct** alternative from the following :

**10**

- i) Viscosity of liquid \_\_\_\_\_ with increase in temperature.  
a) Decreases  
b) Increases  
c) Does not change  
d) None of these
- ii) If the frequency of waves is above \_\_\_\_\_ then they are called ultrasonic waves.  
a) 20 Hz  
b) 1 KHz  
c) 2 KHz  
d) 20 KHz
- iii) When an angle of incidence ‘ $i$ ’ is equal to  $25^\circ$ , by the law of reflection an angle of reflection is equal to \_\_\_\_\_.  
a)  $45^\circ$   
b)  $50^\circ$   
c)  $30^\circ$   
d)  $25^\circ$
- iv) Cgs unit of viscosity is \_\_\_\_\_.  
a) Newton  
b) Poise  
c) Erg  
d) Hertz



- v) Young's modulus is the property of \_\_\_\_\_
- a) Only solids  
b) Only liquids  
c) Solids and liquids  
d) Liquids and gases
- vi) By Brewster's law, polarising angle ( $i_p$ ) and refractive index ( $\mu$ ) are related as \_\_\_\_\_
- a)  $\mu = \tan(i_p)$   
b)  $\mu = \text{Sin}(i_p)$   
c)  $\mu = \cos(i_p)$   
d)  $\mu = \frac{1}{i_p}$
- vii) \_\_\_\_\_ 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) None of these
- viii) If water flows through a horizontal canal calmly then the type of flow is \_\_\_\_\_
- a) Circular  
b) Turbulent  
c) Streamline  
d) None of these
- ix) For constructive type of interference of light, the path difference between two monochromatic light waves reaching at a point is \_\_\_\_\_
- a)  $n\lambda$   
b)  $2n\lambda$   
c)  $(2n+1)\lambda$   
d)  $(2n+1)\frac{\lambda}{2}$
- x) Angle of contact between pure water and clean glass is \_\_\_\_\_
- a)  $90^\circ$   
b) Zero  
c)  $120^\circ$   
d)  $50^\circ$



2. Answer **any five** of the following : 10
- 1) Define : a) Stress b) Strain
  - 2) What is Doppler effect ?
  - 3) State any two applications of a Laser source of light.
  - 4) Define : a) Range of molecular attraction  
b) Sphere of influence
  - 5) State the properties of ultrasonic waves.
  - 6) Define coefficient of viscosity.
3. A) Attempt **any two** of the following : 6
- 1) How beats are formed ? State any two applications of beats.
  - 2) Describe the process of pumping used in production of laser.
  - 3) Explain streamline flow and turbulent flow of a liquid.
- B) What is elasticity ? Explain the importance of elasticity. 4
4. Attempt **any two** of the following : 10
- 1) What are ultrasonic waves ? Explain in brief any two applications of them.
  - 2) Describe the working of venturimeter.
  - 3) Discuss the factors affecting surface tension.
5. Attempt **any two** of the following : 10
- 1) Write a note one Nicol prism.
  - 2) Describe Jaeger's method for measurement of surface tension.
  - 3) What do you mean by
    - a) Young's modulus
    - b) Bulk modulus
    - c) Modulus of rigidity ?state the relation between them.
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**B.Sc. – I (Semester – I) Biotechnology (New) Examination, 2014**

**CELL BIOLOGY AND BIostatISTICS  
Paper – I : Cell Biology**

Day and Date : Wednesday, 11-6-2014

Total Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

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

1. Rewrite the sentences by using **correct** alternative. **10**

1) Bacteria carry extrachromosomal elements in the form of small, circular and closed DNA molecules called \_\_\_\_\_

- a) Bacterial Chromosome                      b) Plasmid DNA  
c) Bacterial DNA                                d) Phagmid

2) \_\_\_\_\_ is known as powerhouse of cell.

- a) Golgi complex                                b) Mitochondria  
c) Ribosomes                                      d) Nucleus

3) The plasma membrane of plant cell is surrounded by a rigid cell wall made by \_\_\_\_\_

- a) Cellulose                                        b) Nucleoplasm  
c) Plasmid                                         d) Cosmid

4)  $\text{Na}^+ - \text{K}^+ / \text{ATPase}$  pump is an example of \_\_\_\_\_

- a) Passive transport                            b) Active transport  
c) Simple diffusion                              d) Facilitated diffusion



5) The process in which water molecules enter into the cell is known as \_\_\_\_\_

- a) Endosmosis
- b) Exosmosis
- c) Plasmolysis
- d) Water transport

6) \_\_\_\_\_ are the proteins, which are embedded within lipid layer of membrane acts as a carrier or transporter.

- a) Amylase
- b) Lipases
- c) Permeases
- d) Pectin

7) In most organisms \_\_\_\_\_ is the start or initiation codon.

- a) UUG
- b) ACA
- c) GGA
- d) AUG

8) The longest phase of meiotic division is \_\_\_\_\_

- a) Prophase – I
- b) Metaphase – I
- c) Anaphase – I
- d) Telophase – I

9) \_\_\_\_\_ is the cell organelle containing hydrolytic enzymes.

- a) Mitochondria
- b) Lysosomes
- c) ER
- d) Golgi complex

10) A defect in protein transport into peroxisome leads to \_\_\_\_\_ syndrome.

- a) Down's
- b) Klinefelter's
- c) Zellweger
- d) Turner's



2. Answer **any five** of the following : **10**
- 1) Define cell growth.
  - 2) What are Microvilli ?
  - 3) Write the characteristics of PPLO's.
  - 4) Sketch and label the diagram of Nucleus.
  - 5) Enlist 4 differences between prokaryotes and eukaryotes.
  - 6) Write the functions of centriole.
3. A) Answer **any two** of the following : **6**
- 1) Describe Anaphase of mitosis.
  - 2) Write a note on intracellular compartment.
  - 3) Describe bulk transport.
- B) Describe the ultrastructure of plasma membrane. **4**
4. Answer **any two** of the following : **10**
- 1) Define giant chromosome. Describe in detail polytene chromosome.
  - 2) Give generalised structure of animal cell.
  - 3) Describe the stages of prophase – I of meiosis – I.
5. Answer **any two** of the following : **10**
- 1) What is protein trafficking ? Explain protein transport occurs in Mitochondria.
  - 2) Describe an account of passive diffusion.
  - 3) Describe in brief types of cell signalling.
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**B.Sc. (Part – I) Biotechnology (Semester – I) (New) Examination, 2014  
CELL BIOLOGY AND BIOSTATISTICS  
Biostatistics (Paper – II)**

Day and Date : Thursday, 12-6-2014  
Time : 3.00 p.m. to 5.00 p.m.

Total Marks : 50

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

1. Multiple choice question :

10

- 1) Quartiles are the partition values which the observation series into \_\_\_\_\_ equal parts.  
a) 2                      b) 3                      c) 4                      d) None of these
- 2) Median can be determine by \_\_\_\_\_  
a) Ogive curve                      b) Pie diagram  
c) Histogram                      d) Bar diagram
- 3) \_\_\_\_\_ is the best average for dealing with qualitative data.  
a) Arithematic mean                      b) Median  
c) Mode                      d) None of these
- 4) Coefficient of Variation (C.V.) is the ratio of \_\_\_\_\_  
a) Standard deviation to mean                      b) Mean to standard deviation  
c) Standard deviation to median                      d) Median to standard deviation
- 5) If two events A and B of sample space  $\Omega$  are independent then the probability is given by \_\_\_\_\_  
a)  $P(A) + P(B)$                       b)  $P(A) - P(B)$   
c)  $P(A) \cdot P(B)$                       d)  $P(A)/P(B)$





- 6) In testing of hypothesis, type I error is \_\_\_\_\_
- a) P (accept  $H_0/H_0$  is true)                      b) P (reject  $H_0/H_0$  is false)  
c) P (reject  $H_0/H_0$  is true)                      d) P (accept  $H_0/H_0$  is false)
- 7) The standard deviation of 100 observation is 10. If each observation is decreased by 5 then the new S.D is \_\_\_\_\_
- a) 5    b) 10  
c) 15    d) 50
- 8) \_\_\_\_\_ is positively skewed and leptokurtic.
- a) Binomial distribution                              b) Normal distribution  
c) Poission distribution                              d) None of these
- 9) A curve which is flatter than the normal curve is known as \_\_\_\_\_
- a) Mesokurtic    b) Platykurtic  
c) Leptokurtic    d) None of these
- 10) If one of the regression coefficient is greater than one, then the other must be \_\_\_\_\_
- a) Equal to one    b) Less than one  
c) Greater than one                                      d) None of these

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

10

- 1) Define combined mean.
- 2) Explain merits and demerits of median.
- 3) An urn contains 6 black balls and 5 white balls. Two balls drawn at random. What is the probability that both will be black ?
- 4) The two regression coefficients  $b_{xy}$  and  $b_{yx}$  are 1.2 and 0.3 respectively. Find correlation coefficient between X and Y.
- 5) Define Binomial Distribution.
- 6) In a moderately skewed distribution, the mode and mean are 40 and 32.6 respectively. Find out the value of median.



3. A) Answer **any two** of the following. 6
- 1) What is measure of central tendency ?
  - 2) What is an ogive curve ? Explain how it is used to locate median.
  - 3) Explain stratified random sampling.

- B) Find the median of blood samples for tryglyceride test of the following data. 4

Glyceride (In mg/dl)	20-30	30-40	40-50	50-60	60-70
Patients	5	10	20	5	3

4. Answer **any two** of the following. 10

- 1) Data on spike length of a wheat variety are given below.  
Calculate the mean, the variance, the standard deviation and coefficient of variation.  
Spike length (cms) = 20, 22, 26, 25, 20, 20, 19, 25, 24, 20
- 2) Calculate the coefficient of correlation between X and Y from the following.

X	3	6	4	5	7
Y	2	4	5	3	6

- 3) Write a note on skewness.

5. Answer **any two** of the following : 10

- 1) Write a note on Chi-square test.
  - 2) Write a note on one-way analysis.
  - 3) A sample of size 400 was drawn and the sample mean was found to be 99. Test wheather this sample could have come from a normal population with mean 100 and standard deviation 8 at 5% level of significance.  
(5% level of significance = 1.96)
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**B.Sc. – I (Sem. – II) (Biotechnology) Examination, 2014**  
**ENGLISH COMPULSORY (New)**  
**On track : English Skills for Success**

Day and Date : Thursday, 8-5-2014  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Rewrite the following sentences choosing the correct alternative. 10

- i) Dr. Kalam had successfully tested \_\_\_\_\_ while he was in France.  
a) PSLV                      b) SLV-3                      c) V-2                      d) Jupiter
- ii) Maharaja of Khetri had given \_\_\_\_\_ to Vivekananda for his journey to America.  
a) money  
b) gold coins  
c) a beautiful robe  
d) copy of the Bhagwad Gita.
- iii) The Parliament of Religions was to be held in \_\_\_\_\_  
a) America                      b) Singapore                      c) Canada                      d) Japan
- iv) After our incredible scientific progress \_\_\_\_\_ is the greatest threat to humanity.  
a) natural calamities                      b) diseases  
c) nuclear weapons                      d) the human being himself/herself
- v) The odd word on the following set of words is \_\_\_\_\_ in the meaning.  
a) slay                      b) murder                      c) help                      d) kill
- vi) 'The bubble house' in the poem 'Full Moon' refers to the \_\_\_\_\_  
a) moon                      b) earth                      c) planet                      d) nature



- vii) The lioness is feeding \_\_\_\_\_ cub.  
a) her                      b) its                      c) it                      d) herself
- viii) Maharastra is one of the \_\_\_\_\_ states in the country.  
a) large                      b) larger                      c) more larger                      d) largest
- ix) Mohan found the \_\_\_\_\_ in his soup yesterday.  
a) hare                      b) here                      c) hear                      d) hair
- x) The antonym for the word 'barren' is \_\_\_\_\_.  
a) infertile                      b) heath                      c) fertile                      d) dull

2. Answer **any five** of the following questions in **two** and **three** sentences **each**.      **10**

- i) Who was Wernher Von Braun and what was his contribution to science and to the world ?
- ii) Summarise the points of advice that Von Braun gave Dr. Kalam.
- iii) What were the points about the new culture that struck Vivekananda on his arrival in America ?
- iv) Who were the other Indians present at the parliament of Religions ?
- v) What do you understand by human rights ?
- vi) Why does the author declare that human rights cannot function in a vacuum ?

3. A) Answer **any two** of the following questions in about **50** words **each**.      **6**

- i) What is the origin or background of the poem 'Brahma' ?
- ii) How was the Moon's light made holy in Gethsemane ?
- iii) Examine the theme of innocence versus experience in the poem 'Full Moon'.

B) Answer briefly **any two** of the following questions.      **4**

- i) What is meant by BCC in e-mail ? Explain.
- ii) What precautions should be taken while sending the e-mails ?
- iii) Write out any two e-mail ID's of your friends.



4. You are Veena Raut the secretary of the 'Student's Union' in 'Doon College, Mumbai. The college is conducting 'Blood Donation Camp' on the occasion of Swami Vivekananda's birth anniversary. Draft notice and agenda informing the members about the date, time and venue of the meeting. 10

OR

Write out the minutes of the 'meeting of Marathi Cultural Association' Mumbai.

Date : 15 July 2013      Time : 10 a.m.

Venue : Kala Bhavan, Mumbai

**Agenda**

- 10.00 a.m. – Call to order
  - 10.15 a.m. – Presentation of the minutes of the previous meeting for approval by the board.
  - 10.30 a.m. – Report of the secretary to the directors of board.
  - 11.00 a.m. – Report of the treasurer
  - 12.00 p.m. – Planning the annual 'Navaratri Festival'.
  - 1.30 p.m. – Adjournment.
5. You wish to apply for the post of Assistant Professor in the subject of Chemistry. Prepare the C.V. for the post with suitable biographical details. 10
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**B.Sc. – I (Semester – II) (Biotechnology) Examination, 2014  
BIOCHEMISTRY AND CELL PHYSIOLOGY (Paper – I) (New)  
Biochemistry**

Day and Date : Monday, 12-5-2014  
Time : 11.00 a.m. to 1.00 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 selecting correct alternative given below : **10**
- i) The general formula for monosaccharides is \_\_\_\_\_  
a)  $C_nH_{2n}O_n$       b)  $C_{2n}H_2O_n$       c)  $C_nH_2O_{2n}$       d)  $C_nH_{2n}O_{2n}$
  - ii) Long chain \_\_\_\_\_ fatty acids are solid at room temperature.  
a) Saturated      b) Unsaturated  
c) Essential      d) Sphingosine containing
  - iii) The sulphur containing amino acid is \_\_\_\_\_  
a) Valine      b) Leucine  
c) Methionine      d) Asparagine
  - iv) The complementary base for guanine is \_\_\_\_\_  
a) Thymine      b) Cytosine      c) Adenine      d) Uracil
  - v) Scurvy is caused due to the deficiency of vitamin \_\_\_\_\_  
a) A      b) D      c) K      d) C
  - vi) In Watson-Crick DNA model number of base pairs per turn is \_\_\_\_\_  
a) 9      b) 10      c) 11      d) 12
  - vii) The protein present in hair is \_\_\_\_\_  
a) Elastin      b) Myosin      c) Keratin      d) Trophocollagen
  - viii) \_\_\_\_\_ is an example of saturated fatty acids.  
a) Arachidonic acid      b) Linoleic acid  
c) Oleic acid      d) Palmitic acid



- ix)  $\alpha$ -D-glucose and  $\beta$ -D-glucose are \_\_\_\_\_  
 a) Stereoisomers  
 b) Epimers  
 c) Anomers  
 d) Keto-aldo pairs
- x) The amino acids having equal number of positive and negative charges is called as \_\_\_\_\_  
 a) Cations  
 b) Anions  
 c) Zwitter ions  
 d) Soluble amino acid

2. Answer **any five** of the following : **10**

- i) What is a trisaccharide ? Give examples.
- ii) Write any two functions of fatty acids.
- iii) Classify proteins based on their molecular shape.
- iv) Distinguish between DNA and RNA.
- v) Enlist the bonds involved in stabilization of structure of proteins.
- vi) Explain the biochemical function of Vitamin A.

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

- i) Describe the structure of sucrose.
- ii) What are lipids ? State different classes of lipids.
- iii) Discuss in brief about chemoproteins.

B) Explain in detail the structure, biochemical functions and deficiency disorders of Vitamin D. **4**

4. Answer **any two** of the following : **10**

- i) Write a note on polysaccharides.
- ii) Describe in detail about prostaglandins.
- iii) Discuss – A, B and Z forms of DNA.

5. Answer **any two** of the following : **10**

- i) Illustrate the quaternary structure of protein with suitable example.
- ii) Write an account of RNAs and illustrate the structure of tRNA.
- iii) Classify monosaccharides.

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**B.Sc. (Part – I) (Semester – II) (Biotechnology) Examination, 2014**  
**BIOCHEMISTRY AND CELL PHYSIOLOGY (New)**  
**Cell Physiology**  
**(Paper – II)**

Day and Date : Tuesday, 13-5-2014  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Rewrite the following sentences by choosing correct alternatives. **10**
- 1) Most common role of cytokinin in plants is \_\_\_\_\_
- a) Cell enlargement                      b) Cell division  
c) Elongation of internodes              d) Apical dominance
- 2) With reference to agricultural crops \_\_\_\_\_ are considered as critical elements.
- a) Mn and Zn                                  b) Co and Ga  
c) Al and Si                                      d) NPK
- 3) Abscisic acid (ABA) is naturally occurring \_\_\_\_\_ which play important role in abscission and dormancy.
- a) growth promoter                          b) seed producer  
c) growth inhibitor                          d) growth initiator
- 4) The structural and functional unit of kidney is
- a) Neuron    b) Adrenal gland  
c) Pancreas                                      d) Nephron
- 5) \_\_\_\_\_ is known as wind pipe of respiratory tract.
- a) Alveoli    b) Lungs  
c) Larynx    d) Trachea

**P.T.O.**





- 6) Thyroxine is secreted by \_\_\_\_\_ gland.
- a) Pituitary gland                      b) Adrenal gland  
c) Pancreas                                d) Thyroid
- 7) Oxyntic cells of stomach secrete \_\_\_\_\_
- a) Pepsin                                    b) HCl  
c) Glucagon                                d) Insulin
- 8) In the central nervous system, the interneuronal space is filled with non nervous supporting cells known as \_\_\_\_\_
- a) Kuffer cells                              b) Neuroglial cells  
c) Adipocytes                                d) Cardiac cells
- 9) ATP stands for
- a) Atekin Tri-Phosphate  
b) Adenosine Tetra Phosphate  
c) Adenosine Tri-Phosphate  
d) Auxin Tri Phosphate
- 10) \_\_\_\_\_ is the only gaseous hormone produced naturally by plants.
- a) Abscisic acid                              b) Ethylene  
c) Gibberellins                                d) Adrenaline

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

10

- 1) Define the term transpiration.
- 2) Draw labelled diagram of stomata.
- 3) Define photosynthesis in plants.
- 4) Explain lag phase of plant growth curve.
- 5) Define the term hormone.
- 6) Write composition of blood.



3. A) Answer **any two** of the following : **6**
- 1) Describe ball and socket joint.
  - 2) Explain structure of neuron.
  - 3) Give applications of auxins.
- B) Write a note on nitrogen fixation. **4**
4. Answer **any two** of the following : **10**
- 1) Define respiration. Describe mechanism of respiration.
  - 2) Describe mechanism of absorption of digested products.
  - 3) Explain  $C_4$  pathway in plants.
5. Answer **any two** of the following : **10**
- 1) Describe various hormones of pituitary gland.
  - 2) Write an account on plant growth regulators.
  - 3) Explain stomatal transpiration in plants.
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**B.Sc. (Part – I) (Semester – II) (Biotechnology) Examination, 2014**  
**BIOMETRY AND TISSUE CULTURE (New)**  
**Biometry (Paper – I)**

Day and Date : Thursday, 15-5-2014  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Multiple Choice Questions :

10

1) If  $P = \{0\}$  and  $Q = \{\}$  then  $P \cap Q =$  \_\_\_\_\_

- a) 0                                  b)  $\{0\}$   
c)  $\{\}$                                   d)  $\{0, \phi\}$

2) If  $N$  is a set of natural numbers and  $Q$  is a set of rational numbers then

- a)  $N \in Q$                                   b)  $Q \in N$   
c)  $Q \subseteq N$                                   d)  $N \subset Q$

3)  $i^{35} =$  \_\_\_\_\_

- a) 1                                  b)  $-1$                                   c)  $i$                                   d)  $-i$

4) If  $z = 7$  then  $\bar{z} =$  \_\_\_\_\_

- a) 7                                  b)  $-7$                                   c) 0                                  d)  $0.\bar{7}$

P.T.O.



5) If  $f(x) = \frac{x^2 + 1}{x}$ , then  $f(-1) =$  \_\_\_\_\_

- a) 0                      b) -2                      c)  $-\frac{1}{2}$                       d) 2

6)  $\lim_{x \rightarrow 2} \frac{\sqrt{x} + \sqrt{2}}{x + 2} =$  \_\_\_\_\_

- a)  $\sqrt{2}$                       b)  $\frac{1}{\sqrt{2}}$                       c) 1                      d)  $\frac{1}{2}$

7) If  $f(x) = 7x - 1$  then  $f'(2) =$  \_\_\_\_\_

- a) 7                      b) 1                      c) 13                      d) 14

8) Order and degree of the differential equation  $y = y \left( \frac{dy}{dx} \right)^3 + 2x^2 \left( \frac{d^2y}{dx^2} \right)$  is

- a) 1, 3                      b) 3, 1                      c) 2, 1                      d) 1, 2

9)  $\int_1^2 (x + 1) dx =$  \_\_\_\_\_

- a)  $\frac{5}{2}$                       b)  $\frac{1}{2}$                       c) 1                      d) 3

10)  $\begin{bmatrix} 3 & -1 \\ 0 & 2 \end{bmatrix}$  is an example of

- a) Upper Triangular Matrix  
b) Lower Triangular Matrix  
c) Symmetric Matrix  
d) Skew-symmetric Matrix



2. Answer **any five** of the following : 10

1) If  $z_1 = 3 + 7i$  and  $z_2 = 7 + 3i$  find  $z_1 \cdot z_2$ .

2) Using Venn diagram represent  $(A \cup B)'$ .

3) Evaluate  $\lim_{x \rightarrow 0} \frac{\tan 5x}{\sin 3x}$ .

4) If  $y = \frac{e^x}{x}$  then find  $\frac{dy}{dx}$ .

5) If  $A = \begin{bmatrix} 2 & 3 \\ 7 & 1 \end{bmatrix}$  and  $B = \begin{bmatrix} 0 & 1 \\ 2 & 1 \end{bmatrix}$  then find  $AB$ .

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

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

1) Write the relation,

$R = \{ (a, b) / a \in \mathbb{N}, a < 6 \text{ and } b = 4 \}$  in the Roster form and hence find its domain and range.

2) Represent complex number  $1 + i$  in the polar form.

3) Find  $\frac{d^2y}{dx^2}$  for  $y = e^x + \cos 7x$ .

B) Evaluate  $\lim_{x \rightarrow 0} \frac{\sqrt{5+x} - \sqrt{5-x}}{x}$ . 4

4. Answer **any two** of the following : 10

1) If  $A = \{ 1, 2, 3, 4 \}$ ,  $B = \{ 3, 4, 5, 6 \}$ ,  $C = \{ 4, 5, 6, 7, 8 \}$  and Universal set  $X = \{ 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 \}$ , then verify

i)  $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

ii)  $n(A \cup B) = n(A) + n(B) - n(A \cap B)$ .



2) Find the maxima and minima of the function  $x^3 - 6x^2 + 9x + 2$ .

3) Find the inverse of matrix  $A = \begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}$  by adjoint method.

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

**10**

1) If  $f$  is continuous at  $x = 2$ . Find  $a$  and  $b$ , where

$$\begin{aligned} f(x) &= \frac{x^2 - 4}{x - 2} + a && \text{for } x < 2 \\ &= 3 && \text{for } x = 2 \\ &= 3x^2 + 5x + b && \text{for } x > 2 \end{aligned}$$

2) Solve the differential equation

$$\sin x \cos y + \cos x \sin y \frac{dy}{dx} = 0.$$

3) Solve  $x + y + z = 9$

$$2x + 5y + 7z = 52$$

$$2x + y - z = 0$$

Using Cramer's Rule.

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**B.Sc. – I Biotechnology (Sem. – II) Examination, 2014**  
**TAXONOMY AND COMPUTER SCIENCE (New)**  
**Paper – I : Taxonomy**

Day and Date : Monday, 19-5-2014

Total Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the complete sentence by selecting appropriate alternatives given : **10**
- i) The five kingdom system of classification was proposed by
    - a) E-Chattas
    - b) Robert Whittakar
    - c) Linnaeus
    - d) Karlene and Margulis
  - ii) \_\_\_\_\_ gave the first natural classification of plants.
    - a) Aristotle
    - b) Linnaeus
    - c) Bentham and Hooker
    - d) De Candolle
  - iii) \_\_\_\_\_ termed the word taxonomy.
    - a) Hacckel
    - b) Linnaeus
    - c) Aristotle
    - d) De Candolle
  - iv) Basic taxonomy unit is
    - a) Kingdom
    - b) Genus
    - c) Species
    - d) Order
  - v) Phylogenetic classification is based on
    - a) Utilitarian system
    - b) Habits
    - c) Overall similarities
    - d) Common evolutionary descent
  - vi) Edible fungus is
    - a) Penicillium
    - b) Agaricus
    - c) Aspergillus
    - d) Phythium
  - vii) The basic unit of an animal is a
    - a) cell
    - b) tissue
    - c) organ
    - d) cytoplasm
  - viii) \_\_\_\_\_ kingdom includes only prokaryotes.
    - a) archaebacteria
    - b) protists
    - c) plants
    - d) fungi



- ix) Plants which are not differentiated into roots, stem and leaves are grouped under
- |                 |                  |
|-----------------|------------------|
| a) gymnosperms  | b) pteridophytes |
| c) thallophytes | d) spermophytes  |
- x) \_\_\_\_\_ are the most primitive group of algae.
- |                     |                |
|---------------------|----------------|
| a) blue green algae | b) red algae   |
| c) brown algae      | d) green algae |
2. Write short answers (**any five**) : **10**
- 1) Define and explain species.
  - 2) Define taxonomy.
  - 3) Give two examples of protozoa.
  - 4) Define numerical taxonomy.
  - 5) Give general characters of algae.
  - 6) Rules of ICBN.
3. A) Write a short note on (**any two**) **6**
- 1) Concepts of domains.
  - 2) General characters of class Reptilia.
  - 3) Economical importance of algae.
- B) Explain the general and important characters of archaebacteria. **4**
4. Write a brief note on (**any two**) : **10**
- 1) Bentham and Hookers classification system for angiosperms.
  - 2) General characters and outline classification upto class for Hemichordat with an example.
  - 3) Aims and principles of taxonomy.
5. Write a brief note on (**any two**) : **10**
- 1) Five kingdom system of classification.
  - 2) Explain conventional and numerical taxonomy for bacterial classification.
  - 3) General characters and outline classification of fungi.
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**B.Sc. – I (Sem. – II) (Biotechnology) Examination, 2014**  
**COMPUTER SCIENCE (New)**  
**Taxonomy and Computer Science (Paper – II)**

Day and Date : Tuesday, 20-5-2014  
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

**N. B. :** 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. **10**
- 1) E-mail stands for \_\_\_\_\_  
a) Electronic mail  
b) Electronically mail  
c) Exchange mail  
d) None
  - 2) \_\_\_\_\_ is a most widely used search engine.  
a) Bing  
b) Google  
c) Khoj  
d) Hit Counter
  - 3) In Excel, the default file name is \_\_\_\_\_  
a) Book 1  
b) Document 1  
c) Presentation 1  
d) Table 1
  - 4) \_\_\_\_\_ bits means 1 byte.  
a) 4  
b) 8  
c) 16  
d) 32
  - 5) \_\_\_\_\_ is a pictorial representation of logic flow of a program.  
a) Flowchart  
b) Chart  
c) Algorithm  
d) Pseudocode
  - 6) \_\_\_\_\_ devices accept data and instructions from the user.  
a) Output  
b) Input  
c) Storage  
d) Utility
  - 7) To open, the short cut key is \_\_\_\_\_  
a) Ctrl+O  
b) Ctrl+N  
c) Ctrl+P  
d) Ctrl+X
  - 8) For database management system \_\_\_\_\_ package is used.  
a) MS Word  
b) MS Excel  
c) MS PowerPoint  
d) MS Access

