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**M.Sc. (Biotechnology) (Part – I) (Semester – I) Examination, 2015
(New CBCS)
Paper – I : MICROBIOLOGY**

Day and Date : Monday, 16-11-2015
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

Note : 1) *Section I compulsory.*
2) *Answer any four questions from Section II.*

SECTION – I

1. A) Rewrite following sentence by using correct option. 7
- i) *Staphylococcus aureus* can be isolated by using _____ medium.
- a) Chocolate agar b) Mannitol salt agar
c) Wilson and Blair's agar d) Sabouraud's agar
- ii) Corpophilous fungi grow on
- a) Tree b) Hairs
c) Dung d) Wood
- iii) Which of the following is not an anoxygenic photosynthetic bacterium ?
- a) *Rhodospirillum* b) *Cyanobacterium*
c) *Chromatium* d) *Chloroflexus*
- iv) Ability of a bacterium to produce H₂S can be detected by using
- a) Acid base indicator b) Lead acetate paper
c) Both a) and b) d) None of these
- v) For sterilization of a room, which of the following method will be more effective ?
- a) Spraying phenol b) Gaseous formaldehyde
c) UV radiation d) Using betapropiolactone



- vi) HIV has _____ as its genome.
- a) + ve sense SS RNA b) – ve sense SS RNA
c) + ve sense SS DNA d) – vesense SS DNA
- vii) _____ cannot be used for vaccine preparation.
- a) Embryonated chicken egg b) Primary cell culture
c) Secondary cell culture d) Continuous cell culture

B) Define the following terms :

7

- i) Axenic culture
ii) Strain
iii) Morphovar
iv) Lysogeny
v) Mycorrhiza
vi) Retrovirus
vii) Archaeobacteria.

SECTION – II

2. Write a brief account of characteristics, habitat, molecular adaptations and applications of extremophiles in extreme conditions of temperature. **14**
3. Describe in detail about a technique used to observe viruses. **14**
4. Explain different methods to carry out sterilization process. **14**
5. Write short notes on **any two** of the following : **14**
- i) Barophiles
ii) HIV multiplication
iii) Lichens.
6. Write short notes on **any two** of the following : **14**
- i) Acid fast staining
ii) Numerical taxonomy
iii) Preservation of cultu.
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Seat No.	
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M.Sc. – I (Semester – I) Examination, 2015
(New – CBCS)
BIOTECHNOLOGY
Paper – II : Concept of Biochemistry

Day and Date : Wednesday, 18-11-2015
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

Note : 1) *Section I is compulsory.*
2) *Answer any four questions from Section II.*

SECTION – I

1.A) Multiple choice question :

7

- 1) Due to presence of iron containing heme prosthetic groups _____ protein shows absorption in visible range.
a) Porins b) Cytochromes c) Ubiquinone d) Coenzyme Q
- 2) _____ sugar is not capable of reducing ferric or cupric ion.
a) Lactose b) Sucrose c) Maltose d) Glucose
- 3) The first law of thermodynamics is based on _____ principle.
a) Conservation of energy b) Conservation of mass
c) Reaction and action d) The entropy-temperation reaction
- 4) _____ promotes reversible removal of a molecule of water from 2-phosphoglycerate to yield phosphoenolpyruvate.
a) Mutase b) Enolase c) Kinase d) Transferase
- 5) The energy of a single photon is greater at the _____ end of the spectrum.
a) Violet b) Blue c) Red d) Green
- 6) Which of the following bioassays are used to detect the presence of auxin _____
a) Avena curvature test and tobacco pith culture
b) Split pea stem curvature test and tobacco pith culture
c) Avena curvature test and split pea stem curvature test
d) Tobacco pith culture only

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Seat No.	
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M.Sc. (Part – I) (Semester – I) Examination, 2015
BIOTECHNOLOGY
Inheritance Biology (New)
Paper – III : (CBCS)

Day and Date : Friday, 20-11-2015
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

Note : Section – I compulsory.
Answer any four questions from Section – II.

SECTION – I

1. A) Rewrite the sentence using correct alternative given below : 7
- i) _____ are 100-400 bp sequences which do not contain any gene.
 - a) SINES
 - b) Alu sequences
 - c) Both a) and b)
 - d) LINES
 - ii) Different forms of a gene that exist within a population are termed as _____
 - a) Pairs
 - b) Alleles
 - c) Hybrids
 - d) Genotype
 - iii) _____ inheritance is controlled by non nuclear genomes.
 - a) Maternal
 - b) Chromosomal
 - c) Cytoplasmic
 - d) All of the above
 - iv) Balbiani rings are found in _____ Chromosomes.
 - a) Polytene
 - b) Lampbrush
 - c) Cytoplasmic
 - d) Heterozygous
 - v) _____ occurs in two patterns; specialized and generalized.
 - a) Conjugation
 - b) Transformation
 - c) Transduction
 - d) All of the above



- vi) LINES and SINES are the nonviral retrotransposons found in _____
- a) Invertebrates b) Protozoa
c) Bacteria d) Vertebrates
- vii) The ABO blood group type locus in human beings is an example of _____ and dominance.
- a) Multiple alleles b) Co-dominance
c) Recessive d) Segregation
- B) Define the following terms : 7
- i) Allele
ii) Conjugation
iii) Genetic polymorphism
iv) C-value paradox
v) Genetic Linkage
vi) Transposons
vii) Aneuploidy.

SECTION – II

2. Describe the methods of gene transfer techniques. 14
3. What are chromosomal aberrations ? Comment on its types. 14
4. Explain why Mendel used pea plant as an experimental material. 14
5. Answer **any two** of the following : 14
- i) What is the significance of study of population genetics ?
ii) Write a note on the SINES and its relationship with Alu sequences.
iii) What is gene mapping ? Explain.
6. Write short notes on **any two** of the following : 14
- i) Describe in detail microsateallites and minisatellites.
ii) Lampbrush chromosome.
iii) Test cross.
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Seat No.	
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**M.Sc. (Part – I) (Semester – I) Examination, 2015
BIOTECHNOLOGY (CBCS)
Paper – IV : Biostatistics and Bioinformatics (New)**

Day and Date : Monday, 23-11-2015
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

- Instructions:** 1) Part – I, Question 1 is **compulsory**.
2) Attempt **any four** questions from Part – II.
3) Figures to the **right** indicate **full** marks.
4) Answers to the Part – I and Part – II are to be written in **same** answer booklet only.

PART – I

1. A) Rewrite the sentence after choosing the correct answer from the given alternatives. 7
- 1) _____ is one of the nucleotide database.
a) GenBank b) PIR c) PMC d) RCSB
 - 2) The structural database of protein is _____
a) Swiss prot b) TrEmbl c) Blocks d) PDB
 - 3) FASTA was developed by _____
a) Needleman and Wunch b) Smith and Waterman
c) Lipman and Pearson d) None
 - 4) _____ is one of the homology modeling tool.
a) BLAST b) Omega c) Swiss model d) All
 - 5) Statistical results are _____
a) absolutely true b) not true
c) true on average d) universally true
 - 6) Frequency of the variable is always _____
a) in percentage b) a fraction c) an integer d) none
 - 7) _____ is not a measure of central tendency.
a) mean b) variability c) median d) mode



B) Definitions :

7

- 1) Transcriptomics
- 2) Alignment
- 3) Molecular dynamics
- 4) Biostatistics
- 5) Variable
- 6) Median
- 7) Chi square test.

PART – II

Answer **any four** of the following :

2. Define bioinformatics. Add a note on its importance. 14
3. Add a note on types of protein databases. 14
4. Write a note on regression and correlation. 14
5. Answer **any two** : 14
 - a) Write a note on multiple sequence alignment.
 - b) Add a note on phylogenetics analysis softwares.
 - c) Represent the following data by means of Pie-diagram.

Name of College	No. of Students
Engineering	440
Arts	220
Agriculture	120
Home Science	80
Fine Arts	60

6. Write short notes on **any two** : 14
 - a) Protein structure prediction
 - b) Advantages and disadvantages of median
 - c) Applications of sampling techniques.
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Seat No.	
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M.Sc. Biotechnology (Part – I) (Semester – II) (CGPA) Examination, 2015
Paper – III : MOLECULAR CELL PROCESSING

Day and Date : Saturday, 21-11-2015
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

- Instructions :**
- 1) Part – I, question 1 is **compulsory**.
 - 2) Attempt **any four** questions from Part – II.
 - 3) Figures to the **right** indicate **full** marks.
 - 4) Answers to the Part – I and Part – II are to be written in **same** answer booklet only.

PART – I

1. A) Rewrite the sentence after choosing the correct answer from the given alternatives :

7

- 1) The amino acid sequence of a polypeptide chain comprises the _____ structure of the protein.
a) Primary b) Secondary c) Tertiary d) Quaternary
- 2) The common demonization occurs during DNA damage
a) Thymine dimer b) Adenine dimer
c) Guanine dimer d) Uracil dimer
- 3) Transcription termination occurs by
a) Rho-dependent b) Rho-independent
c) Sigma factor d) Both a and b
- 4) In eukaryotic cells the lagging strands are synthesized by
a) Pol δ b) Pol ϵ c) Pol E d) Pol $\text{\$}$
- 5) _____ sub unit act as a clamp during DNA replication.
a) β b) α c) θ d) τ
- 6) _____ RNA required for protein synthesis.
a) tRNA b) mRNA c) rRNA d) All of these
- 7) The peptide chain grows on _____ site.
a) A b) P c) E d) G

P.T.O.



B) Definitions :

7

- 1) Foot printing
- 2) Ubiquitination
- 3) RNA Editing
- 4) Aminoacyl tRNA synthetase
- 5) Holiday Model
- 6) SOS repair
- 7) Klenow fragment.

PART – II

Answer **any four** of the following :

2. What are ribosomes ? Explain the process of translation in prokaryote with a neat labeled diagram. 14
 3. Explain the nucleotide excision and mismatch DNA repair mechanisms with neat labeled diagram. 14
 4. Describe the structure, assembly and function of each subunit of DNA pol III with neat labeled diagram. 14
 5. Explain the post translation modifications with examples. 14
 6. Answer **any two** from the following : 14
 - a) Write a note on post transcription modification of eukaryotic mRNA.
 - b) Add a note on recombination process.
 - c) Write a note on different RNA polymerases.
 7. Write short notes on (**any two**) : 14
 - a) Enzymes involved in DNA replication.
 - b) Genetic code.
 - c) rRNA.
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Seat No.	
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M.Sc. (Part – I) (Semester – II) (CGPA) Examination, 2015
BIOTECHNOLOGY
Paper – IV : Immunology and Immunotechniques

Day and Date : Tuesday, 24-11-2015
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

- Instructions:** 1) **All** questions of Section I are **compulsory**.
2) Answer **any four** questions from Section II.
3) **All** questions carry **equal** marks.
4) Draw **neat** and labelled diagrams **wherever** necessary.

SECTION – I

1. A) Rewrite the following sentences by choosing the correct alternative given below :
- i) _____ proteins are present on surface of T helper cells.
a) CD4 b) CD8 c) CD12 d) None of these
- ii) Secondary immune response is characterized by the production of _____ type of antibodies.
a) IgM b) IgD c) IgG d) IgA
- iii) Antibodies labeled with enzymes are used in _____ test.
a) Immunofluorescence b) ELISA
c) Complement fixation d) Agglutination
- iv) Passive immunization is done by using _____
a) vaccines b) toxoids
c) immune sera d) toxins
- v) The antigens involved in the rejection of graft are called _____
a) Autoantigens b) Heterophile antigens
c) MHC antigen d) Proantigen

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Seat No.	
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M.Sc. (Part – II) (Semester – III) Examination, 2015
BIOTECHNOLOGY (C.G.P.A.)
Paper – I : Advanced Analytical Techniques

Day and Date : Monday, 16-11-2015

Max. Marks : 70

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

- N.B. :*** 1) *Section I is compulsory.*
2) *From Section II attempt any four.*
3) *All questions carry equal marks.*
4) *Figures to right indicate full marks.*
5) *Draw neat and labelled diagram.*

SECTION – I

1. A) Complete the sentences by selecting correct answer from given alternatives : **7**
- i) The highest frequency of electromagnetic spectrum lies in the _____ field.
a) Cosmic rays b) Gamma rays c) X-rays d) UV rays
 - ii) The discovery of the structure of the DNA was possible due to the availability of data from _____.
a) CD and ORD b) X-ray crystallography
c) IR spectrum d) Visible spectrum
 - iii) The sedimentation coefficient S is identified by the name of _____.
a) Sorenson b) Svedberg c) Sutton d) Stern
 - iv) In _____ type of chromatography the separation of biomolecules is based on charge.
a) HPLC b) GC – MS
c) Ion exchange d) Electrophoresis
 - v) The separation of proteins in 2D-PAGE involves the technique of _____ followed by SDS-PAGE.
a) Denaturation b) Renaturation
c) Isoelectric focusing d) Migration

P.T.O.



Seat No.	
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**M.Sc. (Part – II) (Semester – III) Examination, 2015
(C.G.P.A.)
BIOTECHNOLOGY
Fermentation Technology
(Paper– II)**

Day and Date : Wednesday, 18-11-2015
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

- Instructions :** 1) *All questions of Section I are compulsory.*
2) *Answer any four questions from Section II.*
3) *All questions carry equal marks.*
4) *Draw neat and labelled diagrams wherever necessary.*

SECTION – I

1. A) Rewrite the following sentences by choosing the correct alternative given below.

7

- 1) In a bioreactor baffles are incorporated
 - A) Prevent vortex and to improve aeration efficiency
 - B) Maintain uniform suspension cell
 - C) Minimise the size of air bubble for get aeration
 - D) Maintain uniform nutrient medium
- 2) The large scale fermentation process air is sterilized by
 - A) Jute fiber
 - B) Membrane
 - C) Cotton fiber
 - D) Glass wool fiber
- 3) Gas bubbles _____ the density of the fluid.
 - A) Increase
 - B) Decrease
 - C) First decrease than increase
 - D) None of the above
- 4) Corn steep liquor is the product of
 - A) Corn Starch
 - B) Sucrose
 - C) Dairy industry
 - D) None of these



6. Answer **any two** of the following. **14**

- a) Write an short note on biosensors.
- b) Write an short note on methods and instruments used in fermentation gas analysis.
- c) Give an account on methods of enzyme immobilization.

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

- a) Short note on ideal characteristics of fermentor
 - b) Short note on crowded plate technique
 - c) Short note on process validation.
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Seat No.	
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**M.Sc (Biotechnology) (Part – II) (Semester – III) (CGPA)
Examination, 2015
Paper – III : RESEARCH METHODOLOGY AND IPR**

Day and Date : Friday, 20-11-2015
Time : 2.30 p.m. to 5.00 p.m.

Total Marks : 70

- Instructions:** 1) *Section – I is compulsory.*
2) *From Section – II attempt any four.*
3) *All questions carry equal marks.*
4) *Figures to right indicate full marks.*
5) *Draw neat and labeled diagrams.*

SECTION – I

1. A) Complete the sentences by selecting correct answer from the given alternatives :

7

- 1) Patent office present in India _____
a) Mumbai b) Chennai c) Kolkata d) All
- 2) _____ of the following is not a type of copyright work.
a) Literary works b) Furniture
c) Sculpture d) Musical works
- 3) _____ are geographical indications in India.
a) Kolhapuri chappal b) Solapur Chaddar
c) Mysore Sandal Soap d) All of these
- 4) Sampling theory helps us to estimate _____ population.
a) Unknown b) Known c) Particular d) Universal
- 5) For preparation of power point _____ rule is used.
a) 5 × 5 b) 3 × 3 c) 4 × 4 d) None of these
- 6) World Intellectual Property Organization was created in _____ year.
a) 1967 b) 1960 c) 1957 d) 1980



- 7) When referencing other work you have cited within the text of the report you should _____
- State the first and the last name of the author
 - Use the authors, date citation method
 - Use an asterisk and a footnote
 - Insert the complete citation in parenthesis
- B) Define the following : 7
- ISSN
 - Sample size
 - Chi square test
 - Regression
 - Copyright
 - Geographical indication
 - Qualitative research.

SECTION – II

Attempt **any four** :

- Explain in detail the author instructions required for preparing manuscript in IJBT. 14
 - What is data collection ? Explain in detail the different methods of data collection. 14
 - Explain patenting of biological materials with examples. 14
 - What is the research problem ? Explain in detail the selection of research problem. 14
 - Answer **any two** : 14
 - Write a note on advantages and disadvantages of Plant breeder right.
 - Explain types of technology transfer.
 - Give a detailed account on review of literature.
 - Write short notes on **(any two)** : 14
 - Industrial designs
 - Copyright
 - Audio-Visual aids in Presentation.
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Seat No.	
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M.Sc. – II (Semester – III) (CGPA) Examination, 2015
BIOTECHNOLOGY
(Paper – IV) Plant Biotechnology

Day and Date : Monday, 23-11-2015

Max. Marks : 70

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

- Instructions:** 1) *Section I is compulsory.*
2) *From Section II attempt any four.*
3) **All questions carry equal marks.**
4) **Figures to right indicate full marks.**
5) **Draw neat and labelled diagrams.**

SECTION – I

1. A) Rewrite the following sentences by using correct alternative :

7

- 1) For protoplast culture _____ is medium is used.
 - a) Murashig and Skoog
 - b) Nagata and Takebe
 - c) Larkin
 - d) White
- 2) _____ is the variation occurs during the plant tissue culture technique.
 - a) Somaclonal variation
 - b) Somatic embryogenesis
 - c) Protoplast culture
 - d) Callus culture
- 3) _____ is the most commonly used as solidifying agent in media.
 - a) Auxins
 - b) Agar
 - c) Sodium
 - d) Antibiotic
- 4) Transfer of gene in plant cell with the help of gene gun is known as _____ technique.
 - a) Electroporation
 - b) Transformation
 - c) Microinjection
 - d) Biolistic



5. Explain in detail Somaclonal variation with suitable example. **14**
6. Answer **any two** of the following : **14**
- 1) Write an essay on organogenesis and its application.
 - 2) Write a note on biotic stress resistant plant with suitable example.
 - 3) Explain molecular farming for enhancement of nutritional value of crop plants.
7. Answer **any two** of the following : **14**
- 1) What are the edible vaccine ? Explain with suitable example.
 - 2) Write a note on cryopreservation.
 - 3) Explain the particle bombardment method for gene transfer.
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