First Semester M.Sc., Degree Examinations

May / June 2022

(CBCS Scheme)

BIOTECHNOLOGY

Paper HC- 1.4 : Cell Biology and Bioinformatics

Time: 3 hrs] [Max.Marks: 75

Instructions : 1) Answer ALL questions.
2) Illustrate the answers wherever necessary.

1. **Write briefly / define.** (7X2=14)
   a) Plasma membrane
   b) Matrix polysaccharides
   c) Lamp brush chromosome
   d) Pluripotency
   e) Pharmacoinformatics
   f) HMM
   g) PSI-BLAST

2. **Write short notes on any THREE of the following.** (3X5=15)
   a) Muscle contraction
   b) Chromosome banding techniques
   c) Database search engines
   d) Motif detection

3. **Answer any TWO of the following.** (2X8=16)
   a) Describe the extracellular matrix structural proteins
   b) Explain the phases of cell cycle, checkpoints and its regulation
   c) Write a note on programming methods and for global and local alignments.

4. Write a note on organization of eukaryotic genome. **15 Marks**

OR

Discuss on multiple sequence alignment, methods and applications.

Contd...2

5. Give a detailed account of classification, characteristics and applications of stem cells.

OR

Write a note on programs and methods for protein secondary structure prediction.

15 Marks

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BIOTECHNOLOGY

Paper HC- 1.1 : Chemistry of Biomolecules and Cellular Metabolism

Time: 3 hrs] [Max.Marks: 75

1. **Define/Explain the following.** (7X2=14)
   a) Buffers
   b. Ruff's Degradation reaction
   c. Structure and uses of Heparin
   d. Chaperones
   e. Energy Transducers
   f. Glucose 6 phosphate dehydrogenase
   g. Secondary Messengers

2. **Write short notes on any THREE of the following.** (3X5=15)
   a) Ramachandran plot
   b) Clover Leaf Model of tRNA.
   c) Ubiquitin mediated proteolysis
   d) Conversion of Acetyl CoA to Mevalonate

3. **Answer any TWO of the following.** (2X8=16)
   a) Given an account of different types of rancidity and its prevention.
   b) Explain the structure of Hemoglobin. Add a note on theory of cooperativity.
   c) Explain the Nitrogen Cycle. Add a note on mechanism of nitrogenase complex

4. Write an account on methods of DNA sequencing methods. Add a note on its significance **15 Marks**

OR

Explain the laws of thermodynamics. Relate ΔG, Enthalpy and Entropy.

Contd...2

5. Explain the structure and classification of amino acids.

OR

Write a detailed account on Gluconeogenesis. Add a note on Cori cycle. **(1X15=15)**

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Q.P. Code No.75803

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BIOTECHNOLOGY

Paper HC- 1.3 : Microbiology

Time: 3 hrs] [Max.Marks: 75

Instructions : 1) Answer ALL questions.
2) Illustrate the answers wherever necessary.

I. **Write briefly / define.** (7X2=14)

a) Microbial stasis

b) Simple staining

c) Rhizosphere

d) Joseph Lister

e) Hyper parasitism

f) Positive interaction

g) Thermophiles

II. **Write short notes on any THREE of the following.** (3X5=15)

a) Outlines of Bergey's manual

b) Numerical taxonomy

c) Confocal microscope

d) Pasteurization

III. **Answer any TWO of the following.** (2X8=16)

a) Discuss the role of temperature on microbial growth

a) Explain the classification and morphology of viruses

b) Describe the characteristics of aerobes and anaerobes.

IV. Explain the different types of sterilization techniques and its significance.

OR

Write an account on viral diseases of man.

15

Contd...2

V. Write an essay on architecture of microbial cell.

OR

Discuss the scope and applications of microbiology in detail. 15

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First Semester M.Sc., Degree Examinations

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BIOTECHNOLOGY

Paper HC- 1.2 : Genetics and Molecular Biology

Time: 3 hrs] *[Max.Marks: 75*

Instructions : 1) Answer ALL questions.
2) Illustrate the answers wherever necessary.

1. **Write briefly / define.** **(7X2=14)**
   a) Epistasis
   b) Frame shift mutation
   c) FLP/FRT
   d) Repetitive sequence
   e) Telomerase
   f) Wobble hypothesis
   g) Carcinogens

2. **Write short notes on any THREE of the following.** **(3X5=15)**
   a) DNA methylation
   b) Chromosome walking
   c) Yeast genome
   d) *Coenorhabditis elegans*

3. **Answer any TWO of the following.** **(2X8=16)**
   a) Write a note on Chromosomal rearrangement
   b) Discuss on dosage compensation
   c) Explain translational factors involved in protein synthesis.

4. Explain the concept and consequences of sex determination in man **15 Marks**

OR

Write a detailed account on DNA repair mechanisms.

Contd...2

5. Discuss in detail DNA - Protein interaction. **15 Marks.**

OR

Give an account of molecular basis of cancer.

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