(BIT10111)

M.Sc. DEGREE EXAMINATION, DECEMBER 2016.

First Semester

Biotechnology

Paper I — GENETICS AND CELL BIOLOGY

(Regulation 2011)

Time : Three hours Maximum : 70 marks

Answer ONE question from each Unit.

All questions carry equal marks.

UNIT I

1. Explain the benzer analysis of fine structure of gene.

Or

2. Write notes :

(a) Linkage and crossing over

(b) RNA as genetic material.

UNIT II

3. Give an account on mapping of bacterial chromosomes by conjugation and transduction.

Or

4. Write notes :

(a) Role of Rec proteins

(b) Transformation.

UNIT III

5. Distinguish between Prokaryotic and Eukaryotic cells.

Or

6. Write notes :

(a) Mitochondria

(b) Plasma membrane.

UNIT IV

7. What is Apoptosis? Explain the mechanism and significance.

Or

8. Write notes :

(a) Nucleus

(b) Polytene chromosomes.

UNIT V

9. Discuss the different forms of Intracellular signaling.

Or

10. Write notes :

(a) Second messengers

(b) Microtubules.

(BIT10211)

M.Sc. DEGREE EXAMINATION, DECEMBER 2016.

First Semester

Biotechnology

Paper II — BIOMOLECULES

(Regulation 2011)

Time : Three hours Maximum : 70 marks

Answer ONE question from each Unit.

All questions carry equal marks.

UNIT I

1. Write an account on mucopolysaccharides.

Or

2. Write notes on :

(a) Acid derivatives of monosaccharides

(b) Glycoproteins.

UNIT II

3. Describe about identification of peptide sequence.

Or

4. Write notes on :

(a) Structure and confirmation of peptide bond.

(b) Stereoisomerism of solid phase peptide synthesis.

UNIT III

5. Discuss about classification and biological functions of proteins.

Or

6. Write notes on :

(a) Quaternary structure of proteins

(b) Significance of protein folding.

UNIT IV

7. Describe the structure and function of heme and its biological importance.

Or

8. Write notes on :

(a) Phospholipids

(b) Steroids.

UNIT V

9. Describe the structure and functions of different types of RNA.

Or

10. Write notes on :

(a) Denaturation of nucleic acids

(b) Write brief note on Tm.

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M.Sc. DEGREE EXAMINATION, DECEMBER 2016.

First Semester

Biotechnology

Paper III — TOOLS AND TECHNIQUES IN BIOLOGY

(Regulation 2011)

Time : Three hours Maximum : 70 marks

Answer ALL questions.

All questions carry equal marks.

(5 × 14 = 70)

UNIT I

1. Explain various types of centrifuges and rotors. Describe the working principle and applications of density gradient centrifuges.

Or

2. Explain enzymatic method and liquid nitrogen in Freeze-Thaw techniques for cells.

UNIT II

3. Explain the experimental procedure, development techniques, working principle and applications of paper chromatography.

Or

4. What are Ion-exchangers? Explain the mechanism of Ion-exchange process. Write the applications of Ion-Exchangers for the separation of amino acids and proteins.

UNIT III

5. Explain the principle, experimental procedure and applications of SDS-PAGE technique.

Or

6. Write in detail about Agarose gel electrophoresis technique.

UNIT IV

7. Explain the theory, working principle and applications of X-ray diffraction technique.

Or

8. Explain the theory, instrumentation, working principle and applications of spectro fluorimetry.

UNIT V

9. Write the preparation of labeled radioactive biological compounds. What are the safety precautions to be taken in handling radioactive isotopes?

Or

10. Explain the three types of radioactive decay namely α, β and γ.

(BIT10411)

M.Sc. DEGREE EXAMINATION, DECEMBER 2016.

First Semester

Biotechnology

Paper IV — ENZYMOLOGY

(Regulation 2011)

Time : Three hours Maximum : 70 marks

Answer ALL questions.

All questions carry equal marks.

UNIT I

1. What is active site of an enzyme? Describe the Fischer and Koshland models of enzyme activation.

Or

2. Write notes on :

   (a) Catalytic power of enzymes

   (b) Nomenclature of enzymes

   (c) Collision theory.

UNIT II

3. Derive Michactis-Menten equation for single substrate enzyme catalysed reactions following rapid equilibrium assumption. Explain the significance of K_m and V_{max}.

Or

4. Write notes on :

(a) Eadie-Hofstee plot

(b) Effect of temperature on enzyme action.

UNIT III

5. Define enzyme inhibition. Explain types of enzyme inhibitions. Describe the competitive, non competitive and uncompetitive enzyme inhibitions with the help of line weaver-Burk plots.

Or

6. How are enzymes assayed and write how to express enzyme activity.

UNIT IV

7. Describe mechanism of enzyme action of ribonuclese.

Or

8. Write notes on :

(a) Describe enzyme modifications by chemical procedures affecting amino acid side.

(b) Use of substrate analogues.

UNIT V

9. What are allosteric enzymes? Discuss the salient features of ATcase that support the allosteric nature of the enzyme and comment on symmetry and sequential models proposed for allosteric enzymes and their significance.

Or

10. Write notes on :

(a) Explain the structure and functions of TPP.

(b) Isoenzymes

(c) Catalytic antibodies.

(BIT10511)

M.Sc. DEGREE EXAMINATION, DECEMBER 2016.

First Semester

Biotechnology

Paper V — GENERAL MICROBIOLOGY

(Regulation 2011)

Time : Three hours Maximum : 70 marks

Answer ALL questions.
All questions carry equal marks.

UNIT I

1. Explain the principles of bacterial taxonomy.

Or

2. Discuss the general characteristics of Algae and fungi.

UNIT II

3. Give an account on the structure and function of flagella and Citra.

Or

4. Write notes on :
   (a) Cell wall
   (b) Plasmids.
   (c) Endospore.

UNIT III

5. Describe the general characteristics of λ - phage and HIV.

Or

6. Discuss the general methods of cultivation and purification of viruses.

UNIT IV

7. Describe the physical and chemical methods of sterilization.

Or

8. Discuss the principle and applications of dark field microscopy.

UNIT V

9. What are nutritional mutants? Explain their significance in metabolic studies.

Or

10. Explain the growth cycle of bacteria. Add a note on synchronous cultures.