3020

B. Tech. 3rd Semester (Bio-Tech.)
Examination – December, 2022

BIOCHEMISTRY

Paper : PCC-BT-205-G

Time : Three hours]　　　　　[Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all. Questions **1** to **8** include *two* questions from each unit and candidates should attempt *one* question from each Unit. Question no. **1** is *compulsory*. All questions carry equal marks.

1. Write note on the following :　　　$2.5 \times 6 = 15$

　　(i)　Electrostatic interactions

　　(ii)　A- DNA

　　(iii)　Protein denaturation

　　(iv)　Energy transducers

　　(v)　Km and Vmax and their significance

　　(vi)　Synthesis of triacylglycerol

UNIT – I

2. Write note on the following :

   (a) Physical properties and biological significance of water   8

   (b) Vander Waals and hydrophobic interactions   7

3. Discuss in detail concept of pH and ionic strength. Derive and discuss Handerson-Hasselbach equation and its significance.   7, 8

UNIT – II

4. Write short note on :

   (a) Secondary structure of proteins   8

   (b) Structure of t-RNA and micro-RNA   7

5. Discuss in detail structure and properties of B and Z-DNA.   15

UNIT – III

6. What is enzyme inhibition ? Discuss non-competitive and un-competitive inhibition.   15

7. Write note on :

   (a) Protein domains and domain architecture   8

   (b) Allosteric enzymes   7

UNIT – IV

8. Write note on :

   (a) Biological nitrogen fixation   8

   (b) Oxidative phosphorylation   7

9. Discuss in detail various steps involved in biosynthesis of fatty acids.   15

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3018

B. Tech. 3rd Semester (Bio-Tech.)
Examination – December, 2022

BIOLOGY

Paper : BSC-BIO-201-G

Time : Three hours]   [Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*. All questions carry equal marks.

1. Write the short note on following :   2.5 × 6 = 15

   (a) Prokaryotic cell

   (b) Types of microbes

   (c) Meiosis

   (d) Fructose

   (e) Lipids

   (f) Ligases

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UNIT – I

2. Explain the animal and plant cell in detail with suitable diagram. **15**

3. Write notes on : **7.5 × 2 = 15**

   (a) Evidence of nucleic acid as a genetic material

   (b) Central dogma

UNIT – II

4. Write the notes on : **7.5 × 2 = 15**

   (a) Structure and function of starch

   (b) Types of RNA

5. Describe the Watson and Crick model of DNA with suitable diagram. **15**

UNIT – III

6. Describe briefly the various tools used in recombinant DNA technology. **15**

7. What are transgenic animals ? Explain the importance of transgenic animals. **15**

UNIT – IV

8. Discuss the applications of biotechnology in medicine and sewage treatment. **15**

9. Write the notes on : **7.5 × 2 = 15**

   (a) Enzyme technology

   (b) Role of biotech in agriculture

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3021

B. Tech. 3rd Semester (Bio-Tech.)
Examination – December, 2022

CELL BIOLOGY

Paper : PCC-BT-207-G

Time : Three hours]   [Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Unit. Question number 1 is *compulsory*. All questions carry equal marks.

1. Write the short notes on the following :   2.5 × 6 = 15

   (i) Functions of cell-wall

   (ii) Cell fractionation

   (iii) Intermediate filaments

   (iv) Lysosomes

   (v) Karyotype

   (vi) Muscular disorders

UNIT – I

2. Describe the chemical composition of the plasma membrane and also describe the transport across the plasma membrane in detail. 15

3. Write the short note on any *two* : 7.5 × 2 = 15

   (a) Difference between prokaryotic & eukaryotic cells

   (b) Cell wall composition and structure

   (c) Eukaryotic cell structure

UNIT – II

4. Write the short note on any *two* : 7.5 × 2 = 15

   (a) SER & RER

   (b) Mitochondria

   (c) Microbodies

5. Describe the types, structure and functions of ribosomes, how the ribosome is helpful in protein synthesis ? 15

UNIT – III

6. Write the short note on any *two* : 7.5 × 2 = 15

   (a) Cell cycle

   (b) Regulation of cell cycle

   (c) Matrix macromolecules

7. What is the nucleus ? Describe the structure and functions of the nucleus in detail. 15

UNIT – IV

8. Write the short note on any *two* : 7.5 × 2 = 15

   (a) Resting potential

   (b) Neurotransmission

   (c) Structural proteins of muscles

9. What is the nerve impulse ? Describe the mechanism of the nerve impulses ? 15

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B. Tech. 3rd Semester (Bio-Tech.) Examination – December, 2022

GENETICS

Paper : PCC-BT-209-G

Time : Three hours]   [Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Unit. Question number 1 is *compulsory*. All questions carry equal marks.

1. Write short note on the following :   2.5 × 6 = 15

    (a) Penetrance and Expressivity

    (b) Polytene Chromosomes

    (c) Mismatch Repair

    (d) Natural Selection

    (e) Physical Basis of heredity

    (f) Heterochromatin

UNIT – I

2. Explain Mendel's Monohybrid and Dihybrid Crosses in detail with suitable examples. 15

3. Explain gene interaction in detail. 15

UNIT – II

4. Explain genome organization in prokaryotes with suitable diagram. 15

5. Explain numerical chromosomal aberrations in detail. 15

UNIT – III

6. Explain maternal Inheritance in detail. 15

7. Explain DNA repair mechanism in detail. 15

UNIT – IV

8. Explain Hardy-Weinberg Law in detail. 15

9. Write a note on any *two* of the following : 7.5 × 2 = 15

   (a) Quantitative and Qualitative traits

   (b) Multiple factor hypotheses

   (c) Somatic Cell Hybridization