B.Sc. Part–II English Semester–III Examination
3S : BIOINFORMATICS
(Fundamentals of Bioinformatics)

Time : Three Hours] [Maximum Marks : 80

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

(2) Draw well labelled diagrams wherever necessary.

1. (A) Fill in the blanks :

(i) Total number of ATP's generated in TCA cycle is _____.

(ii) Protein sequence is also called as _____ structure of protein.

(iii) Chain of monosaccharide is called _____.

(iv) Water is a _____ solvent. 2

(B) Choose the correct alternative :

(i) The cell stores the energy in the form of _____.

(a) ATP (b) AMP

(c) GDP (d) CGMP

(ii) Gram equivalent weight of substance in one litre of solution is :

(a) 1 Normal (b) 1 Molar

(c) pH (d) 1 Molal

(iii) TCA is carried out in the _____.

(a) Vacuoles (b) Cytoplasm

(c) Mitochondria (d) Nucleus

(iv) Enzymes were observed for the first time in yeast, known as :

(a) Zymase (b) Ligase

(c) Yeast (d) Primase 2

(C) Answer in one sentence :

(i) Define V_{max}

(ii) Give full form of GTP

(iii) Define pH

(iv) Name the sugar present in sugarcane. 4

2. Explain :

(a) Water as a biological solvent 4

(b) Concept of osmolarity 4

(c) Buffer solution 4

OR

(d) Weak acids and weak bases 4

(e) Ionization of water 4

(f) Molarity and Normality. 4

3. Describe structure, occurrence and biological importance of Monosaccharide. 12

OR

Define carbohydrates. How are they classified and enlist their importance. 12

4. (a) Give biological functions of lipids 4

(b) Describe saturated and unsaturated fatty acid. 4

(c) What are steroids ? 4

OR

(d) What are simple lipids ? Give its examples. 4

(e) Describe triglycerides. 4

(f) What are glycerophospholipids ? 4

5. (a) Discuss denaturation and renaturation 4

(b) Describe biological functions of Proteins 4

(c) Define Proteins. How they are classified ? 4

OR

(d) Describe features of α-Helix 4

(e) Describe tertiary structure of protein 4

(f) Describe role of amino acid in proteins. 4

6. (a) Describe factors affecting rate of enzyme reaction 4

(b) Define enzyme. Describe its characteristics. 4

(c) Describe Holoenzymes and apoenzymes 4

OR

(d) Describe Nomenclature of enzymes 4

(e) Describe K_m and V_{max} in enzyme kinetics. 4

(f) Describe active sites of enzymes. 4

7. What is EMP pathway ? Draw diagram and discuss in detail regulatory steps of EMP pahtway. 12

OR

Define Bioenergetics. Describe the structure and biological role of ATP. 12