AS–1420

B.Sc. Part—II (Semester—III) Examination

BIOINFORMATICS

(Fundamentals of Bioinformatics)

Time : Three Hours] [Maximum Marks : 80

Note :— (1) **All** questions are compulsory.

(2) Draw well labelled diagrams wherever necessary.

1. (A) Fill in the blanks :

(i) _____ is a universal solvent.

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

(iii) _____ is a structural polysaccharide present in plant cells.

(iv) Glycolysis is carried out in the _____. 2

(B) Choose the correct alternative :

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

(a) 1 Normal solution (b) 1 Molar solution

(c) pH (d) 1 Molal solution

(ii) α-helix is a :

(a) Primary structure element (b) Secondary structure element

(c) Teritiary structure element

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

(a) ATP (b) AMP

(c) cAMP (d) GDP

(iv) Enzymes were observed for the first time in :

(a) Bacteria (b) Yeast

(c) Drosophila (d) Maize 2

(C) Answer in **one** word :

(i) Define K_m.

(ii) What is molarity of a solution ?

(iii) Name the building blocks of protein.

(iv) Name the sugar present in milk. 4

2. Describe :

(a) Water as a universal solvent. 4

(b) Define molarity and normality. What is difference between both ? 4

(c) What are weak acids and weak bases ? Give their examples. 4

OR

(p) Discuss about pH. 4

(q) Describe buffer solutions. 4

(r) What do you mean by equivalent weight ? 4

3. (a) Define carbohydrates. How are they classified ? Discuss in detail. 12

OR

(b) Describe structure, occurrence and biological importance of Monosaccharides. 12

4. (a) What are simple lipids ? Give example. 4

(b) What do you mean by saturated fatty acids ? Give at least 3 examples. 4

(c) Give biological functions of lipids. 4

OR

(p) Describe triglycerides. What is their role in formation of lipids ? 4

(q) Discuss glycerophospholipids. 4

(r) What are isoprenoids ? 4

5. (a) Amino acids are building blocks of protein. Justify. 4

(b) Describe isoelectric point of protein. How this property is utilized for purification of protein ? 4

(c) Discuss denaturation and renaturation. 4

OR

(p) What are catalytic proteins ? What are their functions ? 4

(q) Describe biological functions of proteins. 4

(r) How proteins are classified ? Give example of each class. 4

6. (a) Define enzyme. Describe general characteristics. 4

(b) Describe properties of enzymes in detail. 4

(c) What do you mean by Holoenzyme ? Describe with example. 4

OR

(p) Describe various coenzymes. 4

(q) Give mechanism of enzyme action. 4

(r) Discuss K_m. What is its importance ? 4

7. Describe TCA Cycle in detail. What is the no. of ATP molecules produced during whole cycle ? 12

OR

What is EMP pathway ? Draw diagram and discuss in detail. 12