

AQ-936

M.Sc. Semester-II (CBCS Scheme) Examination
BIOINFORMATICS
(Biochemistry and Biophysics)
Paper—V

Time : Three Hours]

[Maximum Marks : 80

Note :- (1) **ALL** questions are compulsory and carry equal marks.

(2) Draw suitable diagrams wherever necessary.

1. (a) What is the role of fatty acids in living organisms at various levels ? 4
- (b) Why is water a universal solvent ? 4
- (c) What are Acylglycerols ? What do they do in the biological systems ? 4
- (d) What is Osmolarity ? How does it affect the living system ? 4

OR

- (p) What are the oligosaccharides ? Which are common oligosaccharides ? Give at least two examples with structures. 4
- (q) What is biological importance of carbohydrates ? Explain with suitable examples. 4

- (r) What are glycoproteins and what is their role in living beings ? Explain with suitable example. 4
- (s) Describe the structure and function of sterols. Explain their types. 4
2. (a) What is Ramachandran Plot ? How does it help to predict the structure of protein ? 4
- (b) Explain the secondary and tertiary structure of t-RNA. 4
- (c) What is immunoglobulin fold and what is its significance ? 4
- (d) Comment upon protein domains. Explain its significance. 4

OR

- (p) Explain Rossmann fold and add the significance of it. 4
- (q) How can you explain DNA polymorphism ? What is its significance ? 4
- (r) Explain about primary and secondary levels of protein structure. 4
- (s) Explain the structure of immunoglobulin. 4
3. Explain the mechanism of transcriptional regulation and discuss the elements or the regulators involved in it. 16

OR

Explain the translation process in prokaryotes in detail with suitable diagram and discuss the difference between prokaryotic and eukaryotic transcription. 16

4. Explain different types of centrifugation and their applications giving suitable examples. 16

OR

Explain the principles of redox reactions. How can you study these reactions using half cell ? Give suitable examples of such reactions taking place in human system. 16

5. (a) Write down basic principles of absorption spectroscopy. 4
- (b) What are basic principles of circular dichroism ? What are its applications ? 4
- (c) How can x-ray crystallography be utilised for determination of 3-D structure of proteins ? 4
- (d) Write down the principles of NMR spectroscopy with its applications. 4

OR

- (p) Describe the process of x-ray crystallography. 4
- (q) What is electron microscopy ? Explain with suitable diagram. 4
- (r) What is IR spectroscopy ? Write down its applications. 4
- (s) Which are different methods of direct visualisation of macromolecules ? Comment on their merits and demerits in brief. 4