M.Sc. (Part–I) Semester–I (CBCS Scheme) Examination

BIOTECHNOLOGY (1 BTB 2)

MACROMOLECULES & ENZYMOLOGY

Time : Three Hours] [Maximum Marks : 100

N.B.:— (1) All questions are compulsory and carry equal marks.

(2) Draw suitable diagram/reactions wherever necessary.

1. (a) What is the function of an electron in electron transport chain ? Explain. 5
   (b) What is free energy ? Discuss its role in deciding direction of a reaction. 5
   (c) Describe in brief iron sulphur proteins involved in respiratory chain. 5
   (d) What reaction is catalyzed by cytochrome oxidase ? Explain. 5

OR

   (p) Is oxidative phosphorylation a reversisle reaction ? If yes, why ? 5
   (q) What is buffer ? Explain with suitable example. 5
   (r) What is Gibbs energy ? Explain. 5
   (s) What do you understand by coupled reaction ? Explain. 5

2. (a) Draw the structure of any two aromatic amino acids. 5
   (b) What do you understand by essential amino acids ? Name any five essential amino acids. 5
   (c) What is primary structure of protein ? Discuss its importance. 5
   (d) What does happen when protein denature ? 5

OR

   (p) Name and draw any two amino acids having. R groups with a net negative charge at pH 7.0. 5
   (q) Why do amino acids show more than one pKa ? 5
   (r) What is the importance of the –R group in an amino acid molecule ? 5
   (s) What is the secondary structure of a protein ? 5

3. (a) Why a buffer of a proper pH is essential for maximum enzyme action ? 5
   (b) What is an activation energy of any reaction ? 5
   (c) Explain cooperative model of allosteric enzyme. 5
   (d) Explain feed back inhibition with suitable example. 5

OR

   (p) How will you decide the temperature for enzyme action experiment ? 5
   (q) Why enzyme is a good catalyst ? 5
   (r) Explain Sequential model of allosteric enzyme. 5
   (s) What is the role of nucleotides in cofactor/coenzyme ? 5

4. Explain the importance and steps involved in pentose phosphate pathway. 20

OR

Explain the importance and steps involved in β-oxidation of C–18 fatty acid and give the account of ATP generated. 20

5. Discuss methods involved in examining protein-ligand interactions. 20

OR

Describe the Edman's method for sequencing of amino acids in a peptide. 20