SL No of QP :5884

Unique Paper Code: 2173522009

Name of the Paper : DSE: Biomolecules II

Name of the Course: B.Sc.(Prog.)

Semester: IV /VI

Duration: 2 hrs

Maximum Marks: 60

Instructions for candidates

1 Write your Roll No. top immediately on receipt of this question paper.
2 Attempt all parts of the question together.
3 Attempt any four questions in all. Each question carries 15 marks.

Question 1 (a) Give the structures of the products expected when glycine reacts with each of the following reagents:

(i) Benzoyl Chloride, Pyridine
(ii) Aqueous NaOH solution
(iii) Aqueous HCl Solution
(iv) Alkaline $CuSO_4$ Solution
(v) Ethanol, HCl

(b) Answer the following:

(i) Name and Structure of one amino acid with side chains containing aromatic groups

(ii) Name and Structure of one amino acid with side chains containing a carboxylic acid group

(iii) Name and Structure of one amino acid with basic side chains

(iv) Define Isoelectric point

(v) Define Electrophoresis

(c) Write the preparation of alanine using the Gabriel Phthalimide and Strecker method.

(5, 5, 5)

Question 2 (a) How t-butyloxycarbonyl group is used for the protection of the N-terminal of the peptide, and give a suitable method for its removal.

(b) Outline the solid phase synthesis of Gly-Ala.

(c) Differentiate between the following:

(i) α helical and β-pleated sheet structure

(ii) Globular and Fibrous protein

(5, 5, 5)

Question 3: (a) Give the name and example of different classes of enzymes as laid out by the Enzyme Commission.

(b) Why are enzymes highly specific in their action? Explain the types of stereochemical specificity by taking suitable examples.

(c) Differentiate between the following

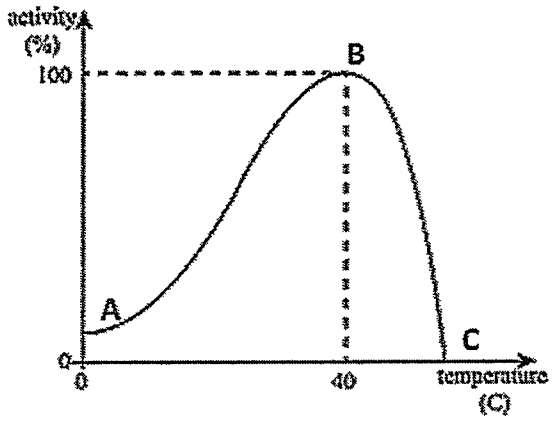
(i) Lock and Key Model and Induced Fit Model

(ii) Coenzymes and Cofactors

(5, 5, 5)

Question 4: (a) Define Inhibition. Explain reversible and Irreversible inhibition by giving suitable examples.

(b) On studying the effect of temperature on enzyme activity following graph is obtained. Explain the effect of temperature on enzyme activity at points A, B, and C. Define optimum temperature.



(c) Give salient features of "Drug-receptor binding theory". Define 'Affinity' and 'Efficacy' of a drug.

(5, 5, 5)

Question 5: (a) (i) Give the account on net ATP molecules generated during the complete oxidation of one mol of glucose molecule.

(ii) Differentiate between catabolism and anabolism by taking suitable examples.

(b) Draw the structure of ATP and explain why it is called the energy currency of the cell.

(c) How is pyruvate converted into lactic acid and ethanol under anaerobic conditions? What are these reactions called?

(5, 5, 5)

Question 6: (a) Define glycolysis and give the net reaction, and differentiate between the preparatory and payoff phases of glycolysis.

(b) Give the structure of FAD and explain how it acts as an electron carrier in biological reactions.

(c) Pictorially represent different steps involved in the TCA cycle.

(5, 5, 5)