

2021

BIOCHEMISTRY — GENERAL

Paper : GE/CC - 2

(Proteins and Enzymes)

Full Marks : 50

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

1. Answer **any five** questions from the following : 2×5
- (a) Give one example of ligase and lyase.
 - (b) Describe secondary structure of a protein.
 - (c) Name two irreversible inhibitors.
 - (d) What do you understand by the subunit structure of a protein?
 - (e) What do you mean by conjugated protein? Give example.
 - (f) What is the role of SDS in SDS-PAGE?
 - (g) How are hydrogen bonds involved in protein folding?
 - (h) What is the difference between myoglobin and haemoglobin?
 - (i) Write the Michaelis-Menten equation and its Lineweaver-Burk form.
 - (j) What is the function of chymotrypsin?
2. Answer **any two** questions from the following:
- (a) (i) What is called the active site of an enzyme?
(ii) How can proteins be classified according to their biological roles?
(iii) How salts are used for the fractionation of protein? 1+2+2
 - (b) (i) What is the principle of HPLC?
(ii) Why is Edman degradation important for? 3+2
 - (c) (i) Which enzyme is mostly found in the heart muscle?
(ii) Derive Michaelis-Menten equation. 1+4
 - (d) (i) C-N in peptide bond is longer than the normal C-N single bond — Justify.
(ii) Differentiate between globular proteins and fibrous proteins.
(iii) What is isoelectric point? 2+2+1

Please Turn Over

3. Answer **any three** questions from the following :

- (a) Describe the structure and function of myoglobin and haemoglobin. 5+5
- (b) (i) Why is a protein's conformation important?
(ii) Draw the complete structures of the following peptides : (A) Thr-Phe-Met, (B) serylglycylphenylalanine.
(iii) State one application of each of the following: (A) SDS-PAGE, (B) IEF. 2+(2+2)+(2+2)
- (c) (i) Explain the significance of V_{\max} and K_m .
(ii) What do you mean by irreversible inhibition? Give an example.
(iii) In the case of allosteric enzymes what is the graphical representation when initial velocity is plotted against substrate concentration? (2+2)+(2+1)+3
- (d) (i) An enzyme hydrolyzed a substrate concentration of 0.03 mmol/L , the initial velocity was 1.5×10^{-3} mmol/L.min⁻¹ and the maximum velocity was 4.5×10^{-3} mmol/L.min⁻¹. Calculate the K_m value.
(ii) 'The rate of an enzyme-catalyzed reaction is proportional to the amount of E-S complex'— Justify.
(iii) What is the function of myoglobin? What is cooperative binding of haemoglobin? 4+2+(2+2)
-