ADVANCED ENZYME TECHNOLOGY
(BIOT 5131)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

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

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) Salts which promote an increase in solvation layer around a protein is known as
(a) Kosmotropes (b) Chaotropes
(c) Inhibitors (d) None of these.

(ii) Thermophillic enzymes are mostly obtained from
(a) Yeast (b) Actinomycetes
(c) Archaea (d) Bacteria.

(iii) Isomerases belong to E.C group of :
(a) 1 (b) 4 (c) 5 (d) 3.

(iv) Lineweaver –Burk Plot gives a good estimate of
(a) K_m value (b) V_{max} value
(c) both K_m and V_{max} (d) none of these.

(v) Competitive inhibition of an enzyme affects
(a) Active site (b) Allosteric site
(c) Enzyme-substrate complex (d) All of the above.

(vi) 1 U of Enzyme is equal to
(a) 16.67 nano katal of enzyme (b) 67.16 nano katal of enzyme
(c) 30.16 nano katal of enzyme (d) None of these.

(vii) Textile industries use huge amount of
(a) Hemicellulase (b) Cellulase
(c) Pectinase (d) Raffinase.

(viii) Heart attack can be treated by the enzyme:
(a) Streptokinase (b) Lysozyme
(c) Hyaluronidase (d) Ribonuclease

(ix) Distribution Coefficient for the largest molecule in a Gel Chromatography is
(a) =1 (b) =0
(c) <0 (d) >1.

(x) Acid protease mainly used in
(a) Detergent Industry (b) Leather industry
(c) Paper Industry (d) Textile Industry.

Group - B

2. (a) Derive Michaelis-Menton Equation.
(b) Write notes on non-competitive inhibition of enzymes.
(c) What do you mean by Enzyme Units?

6 + 4 + 2 = 12

3. (a) How can you lyse cells by Lytic method?
(b) How is Line weaver – Burk plot prepared?
(c) Draw a sketch diagram to show how K_m and $V_{max.}$ can be obtained from Line weaver – Burk plot.

4 + 4 + 4 = 12

Group - C

4 . (a) Briefly describe two methods of immobilizing the enzymes.
(b) Write notes on different adsorbents used in Adsorption Chromatography.

6 + 6 = 12

5. (a) Briefly describe CSTR as Immobilized Enzyme Bioreactor.
(b) What do you mean by Damköhler numbers?
(c) What do you mean by Selectivity Factor of a compound?
(d) What are the factors on which the Retardation Factor of a compound depends?

5 + 3 +2 + 2 = 12

Group – D

6. (a) Mention the role of enzymes in textile industries.
(b) Write notes on enzymes hydrolyzing starch polysaccharide into glucose.

6 + 6 =12

7. (a) What is the function of penicillin acylase and how it is immobilised?
(b) Briefly explain chillhazing and stailing.
(c) What is HFCS and how it is prepared?

3 + 3 + 3 + 3 = 12

Group - E

8. (a) Discuss the ideal characteristics of a Biosensor.
(b) Describe the design and mechanism of a calorimetric biosensor taking any one exothermic reaction as example.

6 + 6 = 12

9. (a) How artificial enzymes are different from natural enzymes?
(b) How recombinant DNA technology can be used for economic production of enzymes?
(c) State how gout can be treated with the application of enzymes?

2 + 6 + 4 = 12