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) Range of mesh values of silica gel used in Flash chromatography is
(a) 70-140 (b) 140-230 (c) 230-400 (d) 400-500.

(ii) The design of which reactor does not allow for control of pH by addition of acids or bases
(a) CSTR (b) Packed Bed Reactor
(c) Bubble column reactor (d) All of the (a), (b) and (c).

(iii) Force(s) of attraction involved between solute and solvent in adsorption chromatography is /are
(a) Vanderwaal's force (b) Dipole-dipole attraction
(c) Weak covalent forces (d) All of the (a), (b) and (c).

(iv) Glutathione is a tripeptide of
(a) Glu-Cys-Gly (b) Cys-Gly-Glu
(c) Cys-Leu-Glu (d) Leu-Glu-Cys.

(v) In which immobilization technique, cyanogen bromide activation is done?
(a) Adsorption (b) Covalent Binding
(c) Entrapment (d) Cross-linking.

(vi) If the solvent is forced down the column by positive air pressure, it is called
(a) Gravity chromatography (b) Gradient chromatography
(c) Isocratic chromatography (d) Flash chromatography.

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

(viii) The enzyme that potentially can be used to treat heart attack is:
(a) Insulin (b) Hyaluronidase
(c) Beta-lactamase (d) Ribonuclease.

(ix) The enzyme that potentially can be used to treat skin ulcers is:
(a) Insulin (b) Lysozyme (c) Collagenase (d)Ribonuclease.

(x) The enzyme that can be used as antibiotic is:
(a) Ribonucease (b) Lysozyne (c) β-lactamase (d) Both (a) and (b)

Group – B

2. (a) Discuss the factors on which sedimentation rate of a particle depends?

(b) Briefly discuss the working principle of Rotary vacuum filter drum in solid-liquid separation.

(c) Classify enzymes based on their mode of action.

4 + 5 + 3 = 12

3. (a) What is an enzyme unit?

(b) Explain how the cells are broken down by High pressure homogenisers.

(c) Write notes on Lyases.

2 + 6 + 4 =12

Group – C

4. (a) Describe the mechanism of salting in and salting out.

(b) Describe the working principle of size exclusion chromatography.

7 + 5 = 12

5. (a) Discuss the advantages of Enzyme Immobilization.

(b) Briefly describe Bubble Column Reactor as Immobilized Enzyme Bioreactor.

6 + 6 = 12

Group – D

6. (a) What is biopolishing? Mention the role of enzyme for biopolishing.

(b) How sweet wine is prepared?

(c) What is leather baiting?

6 + 3 + 3 =12

7. (a) What is the function of penicillin acylase and how it is immobilised?

(b) Distinguish the mode of action of glucose isomerase and glucose oxidase.

(c) What is desizing?

3 +6 +3 = 12

Group – E

8. (a) What are biosensors?

(b) Discuss the features that a successful biosensor must possess.

(c) Draw a schematic diagram showing the main components of a biosensor.

2 + 4 + 6 = 12

9. (a) What is artificial enzyme?

(b) Describe the role of two different enzymes in treatment of leukemia.

4+ (4 + 4) =12