**M.TECH/BT/1st SEM/BIOT 5102/2017**
**ADVANCED ENZYME TECHNOLOGY**
**(BIOT 5102)**

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

(ii) The enzyme mainly used in biopolishing is
(a) cellulase (b) xylanase
(c) protease (d) lipase.

(iii) In gel chromatography, if Vg =Volume of the beads, Vi =Volume of the pores, Vo = Void Volume and Vt = Total Volume
(a) Vt = Vg + Vi - Vo (b) Vt = Vg + Vi + Vo
(c) Vg = Vt + Vi + Vo (d) Vt = Vg - Vi - Vo.

(iv) Relation among Partition coefficient(K), retention factor(k) and Phase ratio(β) is
(a) k=K/β (b) β=kK
(c) K=k/β (d) K=kβ.

(v) Isocratic condition in HPLC takes place when mobile phase composition
(a) decreases with time (b) increases with time
(c) remains constant with time (d) none of these.





(vi) If the solvent is forced down the column by positive air pressure, it is called
(a) gravity Chromatography (b) flash Chromatography
(c) gradient Chromatography (d) isocratic Chromatography.

(vii) Alkaline protease is mainly used in
(a) detergent Industry (b) leather industry
(c) paper Industry (d) textile Industry.

(viii) The enzyme used to treat Leukaemia is:
(a) asparaginase (b) glutaminase
(c) either of a or b (d) both a and b.

(ix) Competitive enzyme inhibition is released by
(a) high substrate (b) low substrate
(c) metal ion (d) reducing agent.

(x) The key component of a biosensor is
(a) transducer (b) bio-recognition Element
(c) amplifier (d) signal processor.

## Group - B

2. (a) What do you mean by Enzyme nomenclature?
(b) What are the different hazards likely to damage enzymes during cell disruption?
(c) Write notes on competitive inhibition of enzymes.
**2 + 6 + 4 = 12**

3. Explain how the cell mass can be separated by Centrifugation and Filtration.
**6 + 6 = 12**

## Group - C

4. (a) What do you mean by Retardation Factor ($R_f$) of a compound?
(b) Derive the relation of partition coefficient, retention factor and phase ratio of a compound.
(c) What are the advantages of Enzyme Immobilization?
**4 + 4 + 4 =12**

5. (a) Briefly describe the working principle of Affinity Chromatography.

   (b) Explain one application of Affinity Chromatography.

**7 + 5 = 12**

## Group - D

6. (a) Mention the function of enzymes for leather baiting and dehairing .

   (b) What is biopolishing?

   (c) Write notes on enzymes hydrolaising cellulose polysaccharide into glucose.

**5 + 3 + 4 = 12**

7. (a) What is the function of lactase?

   (b) What is the function of asparaginase in baking industry?

   (c) What is the difference between pullulanase and raffinase?

   (d) How lactase enzyme is immobilized?

**3 + 3 + 3 + 3 = 12**

## Group - E

8. (a) Define artificial enzyme.

   (b) How enzymes can be used in the treatment of cancer?

   (c) Genetic engineering has a huge potential for economic enzyme production — discuss.

**2 + 4 + 6 = 12**

9. (a) Define biosensor.

   (b) Describe the structural component of an ideal biosensor with a diagram.

   (c) Write down the properties of an ideal biosensor?

**2 + 5 + 5 = 12**