

B.TECH/BT/4TH SEM/BIOT 2204/2017
INDUSTRIAL MICROBIOLOGY AND ENZYME TECHNOLOGY
(BIOT 2204)

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) Acid protease are mainly used in
(a) leather industry (b) detergent industry
(c) paper industry (d) none of these.
- (ii) Lyophilization is the storage of commercial strain through
(a) sporulation (b) freeze drying
(c) mixing with soil (d) none of these.
- (iii) Riboflavin is commercially synthesized by
(a) *Ashbya gossypii* (b) *Pseudomonas ovalis*
(c) *Bacillus subtilis* (d) none of these.
- (iv) The precursor for the biosynthesis of glutamate by *Coreynebacterium glutamicum* is
(a) starch (b) cellulose (c) glucose (d) lactose.
- (v) Polysaccharide matrix is activated for enzyme immobilization by
(a) glutaraldehyde (b) acetic acid
(c) cyanogen bromide (d) acetic anhydride.
- (vi) Thermophilic enzymes are mostly obtained from
(a) yeast (b) actinomycetes (c) achaea (d) bacteria.
- (vii) Textile industries use huge amount of
(a) lipase (b) pectinase (c) cellulase (d) glucose oxidase.
- (viii) Enzyme is entrapped immobilized in alginate in presence of
(a) K⁺ ion (b) Ca⁺⁺ ion (c) acid (d) Mg⁺⁺ ion.

- (ix) Essential enzyme for fruit juice clarification is
 (a) lipase (b) pectinase (c) cellulase (d) glucose oxidase.
- (x) Borate is required for synthesis of
 (a) acetic acid (b) citric acid (c) gluconic acid (d) none of these.

Group – B

2. (a) Schematically illustrate Riboflavin production with flow diagram.
 (b) Prove Name producer organisms for acetic acid production.
 (c) How citric acid is recovered?
7 + 2 + 3 = 12
3. (a) Schematically illustrate Penicillin production with a flow sheet.
 (b) Name the producer organism and all other relevant parameters.
 (c) How is Penicillin recovered?
7 + 3 + 2 = 12

Group – C

4. (a) What is catabolite repression?
 (b) What is batch fermentation?
 (c) Write any two methods for production of GMM.
4 + 4 + 4 = 12
5. (a) What are merits and demerits of solid state fermentation?
 (b) What is screening ?
 (c) Write any two downstream processing technology.
4 + 4 + 4 = 12

Group – D

6. Write notes on followings:
 (i) Enzymes hydrolyzing cellulose polysaccharides into glucose
 (ii) Enzymes used for blood glucose analysis
 (iii) Use of extremophilic enzymes in biotechnology.
(3 × 4) = 12

7. (a) What is International unit and specific activity of an enzyme
 (b) How nanokat and IU are related?
 (c) Why enzyme activity falls after a certain temperature?
 (d) Why enzyme changes activity with change of pH of the reaction mixture?
 (e) How Km value of an enzyme is related to substrate concentration?

2 + 2 + 3 + 3 + 2 = 12

Group – E

8. (a) What are the benefits of immobilizing an enzyme?
 (b) Describe at least two methods by which you could immobilize enzyme.
 (c) Shortly describe one commercial process where immobilized enzyme is used successfully.
4 + 4 + 4 = 12
9. (a) What are the different biosensors developed using enzyme electrode?
 (b) Explain how biosensors can be used in environmental monitoring.
6 + 6 = 12