B.TECH/BT/4TH SEM/BIOT 2204/2019
INDUSTRIAL MICROBIOLOGY & 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) Xylanase is mainly used in
(a) leather industry (b) detergent industry
(c) paper industry (d) none of these.

(ii) Xanthan is commercially synthesized by
(a) ashbya gossypii (b) pseudomonas ovalis
(c) bacillus subtilis (d) xanthomonas campestris.

(iii) Limitation of iron is essential for industrial production of
(a) lysine (b) penicillin (c) ascorbic acid (d) citric acid.

(iv) Lyophilization is the storage of commercial strain through
(a) sporulation (b) freeze drying
(c) mixing with soil (d) none of these.

(v) Most common food flavouring agent is
(a) glutaraldehyde (b) vanillin
(c) cyanogen bromide (d) acetic anhydride.

(vi) The enzyme hexokinase is classified as
(a) lyase (b) transferase (c) hydrolase (d) oxidoreductase.

(vii) Metal which inhibit citric acid accumulation is
(a) iron (b) magnesium (c) calcium (d) none of these.

(viii) Secondary metabolites are produced in
(a) lag phase (b) tropophase (c) idiophase (d) none of these.

(ix) Immobilization technique where enzyme molecules are attached non-covalently on the surface of an insoluble carrier is known as
(a) adsorption (b) covalent bonding
(c) encapsulation (d) cross-linking.

(x) Biosensor which uses quartz crystal is called
(a) calorimetric biosensor (b) piezo-electric biosensor
(c) amperometric Biosensor (d) optical Biosensor.

Group – B

2. (a) Schematically illustrate dextran production with flow diagram.
(b) Discuss the effect of biotin for industrial production of amino acid.
(c) What critical limiting factors are used in the penicillin production?
6 + 3 + 3 = 12

3. (a) Write the role of Fe for production of citric acid.
(b) Why borate is essential in gluconic acid production?
(c) Write down the role of SO_2 in wine production.
4 + 4 + 4 = 12

Group – C

4. Write notes on -
(a) Catabolite repressed mutant
(b) Physical and chemical mutagen
(c) Transition versus transversion
4 + 4 + 4 = 12

5. (a) Define downstream processing. Give any two examples.
(b) How O_2 concentration is maintained in bioreactor ?
(c) Distinguish batch and continuous fermentation.
4 + 4 + 4 = 12

Group – D

6. (a) Why enzyme activity changes with change of pH ?
(b) Discuss different types of extremophile and their utility in different enzyme mediated processes.
4 + 8 = 12

7. Write notes on followings:
(a) Enzymes hydrolyzing cellulose polysaccharides into glucose
(b) Neo-glycosylation of enzyme for better stability
(c) Reagent used for modification of alkaline phosphatase and penicillin G acylase enzyme.
5 + 3 + 4 = 12

Group – E

8 . (a) Give the schematic representation of a biosensor.

(b) What is the role of thermistors in calorimetric biosensors?

(c) State the function of enzyme electrode.

5 + 5 + 2=12

9. (a) Describe the working principle of hollow fibre bioreactor as reactor of immobilized enzymes.

(b) How can you immobilize enzymes by encapsulation? Write its advantages and limitations.

6 + (3+2+1) =12