

**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 alternatives for the following: **10 x 1=10**

- (i) Xanthan is
(a) homopolysaccharide (b) heteropolysaccharide
(c) both (a) and (b) (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) Secondary metabolites are produced in
(a) lag phase (b) tropophase
(c) idiophase (d) none of these.

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- (vi) Phenylacetic acid is precursor of
(a) penicillin (b) streptomycin
(c) chloramphenicol (d) none of these.
- (vii) Halophilic bacteria produces enzymes which are stable at
(a) Low pH (b) alkaline pH
(c) high temperature (d) high salt concentration.
- (viii) E.C No. 1.a.b.c. means which enzyme?
(a) Hydrolase (b) ligase
(c) oxido-reductase (d) lyase.
- (ix) Enzyme is entrapped immobilized in k-carragenan in presence of
(a) K⁺ ion (b) Ca⁺⁺ ion (c) acid (d) Mg⁺⁺ io.
- (x) Aldolase is a
(a) Lyase enzyme (b) hyrolase enzyme,
(c) red-ox enzyme (d) none of them.

Group - B

2. (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

3. What is xanthan? How it is produced by fermentation?
How vitamin B12 is recovered after purification?

2 + 6 + 4 = 12

Group - C

4. Write notes on -
(a) Analogue resistant mutant.
(b) Batch vs Fed batch fermentation

(c) Protoplast fusion.

$$4 + 4 + 4 = 12$$

5. What is catabolite repression? How it inhibit the industrial production?
Define transition and transversion.

$$2 + 5 + 5 = 12$$

Group - D

6. (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?

$$2 + 2 + 3 + 3 + 2 = 12$$

7. Write notes on followings (Any three)

(a) Enzymes hydrolyzing cellulose into glucose

(b) Enzymes used for blood urea and uric acid determinations

(c) Use of extremophilic enzymes in biotechnology

(d) Neo-glycosylation of enzyme for better stability

(e) Engineering enzymes for better stability

$$3 \times 4 = 12$$

Group - E

8. (a) What is immobilization of enzyme?
- (b) Describe different techniques available for the immobilization an enzyme?
- (c) State merits and demerits of different techniques of immobilization.

2 + 5 + 5 = 12

9. (a) What is biosensor? Describe different types of glucose biosensors.
- (b) Describe enzymes for the synthesis of peptide and designed edible oil.

6 + 6 = 12