

**INDUSTRIAL MICROBIOLOGY & ENZYME TECHNOLOGY
(BTC2202)**

Time Allotted : 2½ hrs

Full Marks : 60

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 4 (four) from Group B to E, taking one from each group.*

Candidates are required to give answer in their own words as far as practicable.

Group – A

1. Answer any twelve:

12 × 1 = 12

Choose the correct alternative for the following

- | | | |
|--------|--|-------------------------|
| (i) | Catabolite repression is eliminated by | |
| | (a) Analogue resistant mutant | (b) Auxotrophic mutant |
| | (c) Fedbatch fermentation | (d) None of these |
| (ii) | Two steps fermentation is required for production of | |
| | (a) Acetic acid | (b) Lactic acid |
| | (c) Gluconic acid | (d) None of these |
| (iii) | Microbial heteropolysaccharide is | |
| | (a) Glucan | (b) Xanthan |
| | (c) Cellulose | (d) None of these |
| (iv) | Transition is kind of | |
| | (a) Point mutation | (b) Frameshift mutation |
| | (c) Silent mutation | (d) None of these |
| (v) | Soyabean meal is source of | |
| | (a) Nitrogen | (b) Carbon |
| | (c) Sulphur | (d) None of these |
| (vi) | Pilot plant is used for preparation of | |
| | (a) Starter culture | (b) Production media |
| | (c) Recovery of product | (d) None of these |
| (vii) | Hexokinase enzyme is under the group of | |
| | (a) Transferase | (b) Lyase |
| | (c) Ligase | (d) None of these |
| (viii) | HFCS is prepared by | |
| | (a) Glucose oxidase | (b) Glucose isomerase |
| | (c) Pectinase | (d) None of these |

- (ix) Lyase enzyme is used for
 (a) Production of double bond (b) Removal of double bond
 (c) Addition of alkyl group (d) None of these
- (x) HFCS is prepared by
 (a) Glucose oxidase (b) Glucose isomerase
 (c) Pectinase (d) None of these

Fill in the blanks with the correct word

- (xi) Transversion is type of _____ mutation.
- (xii) Nitrous acid is type of _____ mutagen.
- (xiii) Pectinase enzyme is used for preparation of _____.
- (xiv) Cost effective nitrogen source is _____.
- (xv) _____ is known as a cross-linking agent.

Group - B

2. (a) Analyse the catabolite repression process. [[CO3](Analyse/HOCQ)]
 (b) Explain briefly the downstream process. [[CO4](Remember/LOCQ)]
 (c) What are the different steps involved in industrial production process. [[CO2](Apply/IOCQ)]
4 + 4 + 4 = 12
3. (a) Analyse the primary screening process. [[CO3](Analyse/HOCQ)]
 (b) Briefly discuss the genetic engineering process. [[CO4](Remember/LOCQ)]
 (c) What is frameshift mutation. [[CO2](Apply/IOCQ)]
 (d) Mention the role of nitrous acid. [[CO2](Apply/IOCQ)]
3 + 4 + 3 + 2 = 12

Group - C

4. (a) Discuss the different steps in beer production process. [[CO3](Analyse/HOCQ)]
 (b) Analyse the role of iron in citric acid production. [[CO4](Remember/LOCQ)]
 (c) What are alcoholic beverages? [[CO2](Apply/IOCQ)]
7 + 3 + 2 = 12
5. (a) Mention one secondary metabolite and its production schematically. [[CO3](Analyse/HOCQ)]
 (b) Briefly discuss how riboflavin is recovered? [[CO4](Remember/LOCQ)]
 (c) Analyse the importance of mashing process. [[CO2](Apply/IOCQ)]
4 + 4 + 4 = 12

Group - D

6. (a) Analyse the mode of action of lyase and ligase. [[CO3](Analyse/HOCQ)]

- (b) Discuss how blood glucose level is estimated by two different methods. [[C04](Remember/LOCQ)]
- (c) Define total activity and specific activity of an enzyme. [[C02](Apply/IOCQ)]
- 4 + 4 + 4 = 12**
7. (a) Explain how penicillin acylase enzyme is immobilised? [[C03](Analyse/HOCQ)]
- (b) Briefly discuss how blood alcohol level is estimated? [[C04](Remember/LOCQ)]
- (c) Classify enzymes on the basis of their mode of action. [[C02](Apply/IOCQ)]
- 4 + 4 + 4 = 12**

Group - E

8. (a) How can you immobilize enzymes by Encapsulation? Write it's advantages and limitations. [[C01](Analyse, Remember/IOCQ, LOCQ)]
- (b) Write down the characteristics of an ideal Biosensor. [[C05](Remember/LOCQ)]
- (2 + 2 + 2) + 6 = 12**
9. (a) Describe the working principle of Packed Bed as reactor of immobilized enzymes. [[C01](Describe/HOCQ)]
- (b) Briefly describe the working principle of a Piezoelectric Biosensor. [[C05](Describe/IOCQ)]
- 6 + 6 = 12**

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	28.12	32.29	39.59

