

This question paper contains 3 printed pages]

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S. No. of Question Paper : 8723

Unique Paper Code : 253505

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Name of the Paper : MIHT-510 Industrial Microbiology

Name of the Course : B.Sc. (Honours) Microbiology Part III

Semester : V

Duration : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt any five questions.

All questions carry equal marks.

1. (a) Under which condition does *Aspergillus niger* produce citric acid in large quantity? 3
- (b) Enlist the various methods of enzyme immobilization. Discuss any two of these in detail. 5
- (c) How can you measure and control foaming in a fermenter? 4
- (d) Why are hops added during brewing? 2
- (e) Who coined the term 'antibiotic'? 1
2. (a) Draw a well labeled diagram of an airlift fermenter and give its uses. 4
- (b) With the help of any two suitable examples, show how microorganisms transform steroids. 4

P.T.O.

- (c) What are the advantages of semisynthetic penicillins over natural penicillins ? 3
- (d) Write a short note on strain development. 4
3. (a) Give the industrial producers and uses of lipases, riboflavin and glutamic acid.  $2 \times 3 = 6$
- (b) What is meant by a continuous fermentation ? Give its applications. 3
- (c) Why is the operating volume of a fermenter always less than its total capacity ? 2
- (d) Write a short note on the device used for agitation in a fermenter. 4
4. Differentiate between the following pairs :
- (i) Batch/Fed Batch Fermentation
- (ii) Glucose isomerase/Glucose oxidase
- (iii) Seed fermenter/Production fermenter
- (iv) Freeze drying/Spray drying
- (v) Ultrafiltration/Solvent extraction  $3 \times 5 = 15$
5. (a) Describe the industrial fermentation process for the production of the following products and give their uses :
- (i) Bioinsecticides
- (ii) Ethanol.  $6 \times 2 = 12$
- (b) Why is it essential to prevent vortex formation in a bioreactor ? 2
- (c) Define Aspect Ratio for a fermenter. 1

6. Write short notes on the following :

- (a) Corn Steep Liquor
- (b) Tower fermenter
- (c) Solid State fermentation
- (d) Primary Screening
- (e) Physical methods of Cell Disruption.

3×5=15