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(c) What is the function of **any three** of the following :

(2×3=6)

- (i) Hops
- (ii) Penicillin acylase
- (iii) Glucose isomerase
- (iv) Antifoam agent

6. (a) Write the steps of industrial production of **any two** of the following products : (7×2=14)

- (i) Penicillin
- (ii) Citric acid
- (iii) Ethanol

(b) Name an industrial producer of the following :

(1×4=4)

- (i) Amylase
- (ii) Glutamic acid
- (iii) Streptomycin
- (iv) Glucose oxidase

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1773

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Unique Paper Code : 2532013603

Name of the Paper : Industrial Microbiology

Name of the Course : **Microbiology**

Semester : Part-III, Semester - VI,

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions.
3. **All** questions carry equal marks.
4. Attempt **all** the parts of a question together.

1. (a) Define the following terms (**any five**) : (2×5=10)

Baffles, Aspect ratio, Sparger, Blackstrap molasses, Peptone, Lyophilization.

(300)

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- (b) Draw a well labeled diagram of CSTR. (5)
- (c) How can you measure and control DO during a fermentation process? (3)
2. Differentiate between the following (**any three**) :
(6×3=18)
- (i) Solid state and Submerged fermentation.
 - (ii) Batch and Fed-batch fermentation.
 - (iii) Lab-scale operation and Production-scale operation.
 - (iv) Crude and synthetic media.
3. (a) Write the contributions of the **any two** of following scientists in the field of industrial microbiology : (2×2=4)
- (i) Selman A. Waksman
 - (ii) Casimir Funk
 - (iii) Louis Pasteur
- (b) Describe **any four** physico-chemical methods used for cell disruption. (8)

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- (c) Describe the design and applications of an airlift fermenter. (6)
4. (a) Write short notes on **any four** of the following : (4×4=16)
- (i) Primary screening of industrially important microorganisms
 - (ii) Solvent-solvent extraction
 - (iii) Impellers
 - (iv) Microbial transformation of steroids
 - (v) Preservation of industrially important cultures
- (b) What is the substrate used for white wine production? (2)
5. (a) Elaborate the principle and applications of spray drying in downstream processing of industrial products. (6)
- (b) What are the advantages of enzyme immobilization? Elaborate any two methods of enzyme immobilization. (6)

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