

This question paper contains **3** printed pages]

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S. No. of Question Paper : **5575**

Unique Paper Code : **2532013603**

Name of the Paper : **Industrial Microbiology**

Name of the Course : **Microbiology (NEP-UGCF)**

Semester : **VI, Part-III**

Duration : **3 Hours**

Maximum Marks : **90**

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

Attempt any *five* questions.

All questions carry equal marks.

Attempt *all* the parts of a question together.

1. (a) Write the contributions of the following scientists : 2×3=6

(i) Casimir Funk

(ii) Louis Pasteur

(iii) Selman A. Waksman

(b) How can you measure and control temperature during a fermentation process ? 6

(c) Write the physico-chemical methods used to break the microbial cells for extraction of intracellular industrial products. 6

P.T.O.

2. (a) Differentiate between the following (any *four*) : 4×4=16
- (i) Molasses and Sulfite waste liquor
 - (ii) Batch and Continuous fermentation
 - (iii) Solid state and Liquid state submerged fermentation
 - (iv) Crude and synthetic fermentation media
 - (v) Lypophilization and Spray drying
- (b) Why is it necessary to prevent vortex formation during fermentation process ? 2
3. (a) Write short notes on any *four* of the following : 4×4=16
- (i) Fed batch fermentation
 - (ii) Primary screening
 - (iii) Solvent-solvent extraction
 - (iv) Sparger
 - (v) Antifoam agent
- (b) What is the function of head space in a fermenter ? 2
4. (a) Discuss the industrial production of any *two* of the following : 2×6=12
- (i) Penicillin
 - (ii) Citric acid
 - (iii) Ethanol
- (b) Draw a well labelled diagram of air lift fermenter 6

5. (a) Explain various methods of enzyme immobilization. 6
- (b) Write the microbial transformation of any *two* important steroids. 4
- (c) Name the industrial producer and write the uses of any *two* of the following products : 2×3=6
- (i) Amylase
- (ii) Vitamin B12
- (iii) Lipase
- (d) What is the function of a seed fermenter ? 2
6. (a) Why is hops used during beer production ? 3
- (b) How are wild type strains of glutamic acid producing bacteria made leaky ? 3
- (c) Explain how white wine is produced ? 4
- (d) Write the applications of penicillin acylase. 2
- (e) Describe the different methods used to preserve and maintain industrially important microbial strains. 6

