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Your Roll No.....

Sr. No. of Question Paper : 6646 HC
Unique Paper Code : 32531501
Name of the Paper : Industrial Microbiology
Name of the Course : B.Sc. (Hons.) Microbiology
Semester : V
Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any 5 questions. All questions carry equal marks.
3. Attempt all parts of a question together.

1. Differentiate between the following (attempt any 5) :
(3×5=15)

- (i) Continuous fermentation and batch fermentation
- (ii) Corn steep liquor and Sulfite waste liquor
- (iii) Lyophilisation and spray drying
- (iv) Rose wine and white wine

- (v) Crude and synthetic fermentation media
- (vi) Pilot scale and production scale fermenter

2. (a) Draw a well labeled diagram of an air lift fermenter. (5)

(b) Discuss the various methods used for preservation and maintenance of industrially important strains. (5)

(c) How can microbial cells be disrupted? (5)

3. (a) Describe the fermentation process involved in the production of the following : (6×2=12)

(i) Streptomycin

(ii) Ethanol

(b) Under what conditions does *Corynebacterium glutamicum* produce glutamic acid in high concentration? (3)

4. (a) Name the industrial producer and write the uses of the following products (attempt any two) : (3×2=6)

(i) Alkaline protease

(ii) Citric acid

(iii) Amylase

(b) Write the contributions of Louis Pasteur in the field of Industrial Microbiology. (3)

(c) What are the advantages of immobilized enzymes over free enzymes? Explain using a suitable example. (5)

(d) Define aspect ratio in fermenter design. (1)

5. (a) Write short notes on the following : (3×3=9)

(i) Impeller

(ii) Protein hydrolysates

(iii) Antifoam agents

(b) Explain the rôle of hops in brewing. (3)

(c) How is solvent extraction used in downstream processing? (3)

6. (a) Discuss the measurement and control of dissolved oxygen in a fermentation process. (4)

(b) Write a note on microbial strain improvement using a

suitable example. (5)

(c) Compare solid state fermentation process with submerged state fermentation process. (4)

(d) Why is the operating volume of a fermenter less than its actual volume? (2)