



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY

SECOND SEMESTER – APRIL 2018

17/16PBT2MC02- FERMENTATION TECHNOLOGY

Date: 19-04-2018
Time: 01:00-04:00

Dept. No.

Max. : 100 Marks

PART – A

Answer ALL the Questions

I. Choose the correct answer

(5 x 1 = 5 Marks)

- _____ were initially used as carriers for antifoams in antibiotic processes.
a) Reducing sugars b) Oils c) Nitrates d) Minerals
- _____ bioreactor is widely used for municipal and industrial wastewater treatment.
a) Stirred tank b) Membrane c) Photo d) Airlift
- A _____ plant is operated to generate information about the fermentation system to design larger industrial facilities.
a) trial b) pilot c) scale down d) scale up
- Enzyme used in conversion of L-aspartate to aspartate phosphate
a) Aldolase b) Aspartokinase c) Hexokinase d) Aspartase
- Azotobacter* play an important role in the _____ cycle.
a) Nitrogen b) Phosphorous c) Carbon d) Water

II. State whether the following are True or False.

(5x1=5 Marks)

- Protoplast fusion is a method employed for screening of industrial microbial strains.
- The advantage of packed beds is the changed flow characteristic due to alterations in the bed porosity during operation.
- Pumping in oxygen equal to BOD is a remedial method of treatment of effluent produced from fermentation industries.
- Reichstein process is related to the production of ethanol.
- Bacillus* sp. is specific commercial producers of intracellular amylases.

III. Complete the following

(5 x 1 = 5 Marks)

- The aim of inoculum development is to increase _____.
- The _____ reactor is widely used with immobilized cells.
- If the process volumes are 300 L and 15 L, the scale down factor would be _____.
- Fungi which produces citric acid is _____.
- _____ extracted from *Humicolainsolens* is beneficial for deinking of different types of paper wastes.

IV. Answer the following within 50 words

(5 x 1 = 5 Marks)

- Mention an important objective of strain improvement.
- What is membrane fouling?
- What is the principle of reverse osmosis?
- Which enzyme is involved in conversion of 3 Phosphoglycerate to 2 Phosphoglycerate?

20. Mention an advantage of Bt insecticide.

PART B

Answer the following each within 500 words.

(5 x 8 = 40 Marks)

Draw diagrams wherever necessary.

21. (a) Write a short note on isolation and improvement of an antibiotic producer.

OR

(b) Briefly outline the process of development of inoculum for industrial fermentations.

22. (a) List some of the safety measures for containment regulation and aseptic operation.

OR

(b) Describe the fluidized bed bioreactor with its advantages and disadvantages.

23. (a) Describe gel filtration chromatography as a purification technique employed in downstream processing.

OR

(b) Write a note on the types of filters used to separate biomass from culture fluid.

24. (a) Write about the production method of isoleucine.

OR

(b) Write a short note on production of alcohol.

25. (a) Give an account on the industrial applications of lipase.

OR

(b) Outline the isolation and production of *Rhizobium* and comment on its industrial application.

PART – C

Answer any TWO of the following, each within 1500 words.

(2 x 20 = 40 Marks)

Draw diagrams wherever necessary.

26. Explain any three techniques of preservation of industrial important isolates.

27. Describe in detail solid state and submerged fermentation techniques.

28. Explain the main steps involved in upstream processing.

29. Give an account on the production of L-glutamic acid.

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