



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY

SECOND SEMESTER – APRIL 2017

16PBT2MC02- FERMENTATION TECHNOLOGY

Date: 21-04-2017
01:00-04:00

Dept. No.

Max. : 100 Marks

PART – A

Answer all the questions

I. Choose the correct answer (5 × 1 = 5 Marks)

- _____ were initially used as carriers for antifoams in antibiotic processes.
a) Reducing sugars b) Oils c) Nitrates d) Minerals
- The standard number of baffles in a fermenter is
a) 2 b) 3 c) 4 d) 5
- In ion exchange chromatography, a crucial factor is
a) pH b) concentration c) molecular weight d) hydrophobicity
- Who discovered Penicillin?
a) Abraham John b) Alexander Flemming c) Paul Theodore d) Paul Flemming
- _____ from *H. insolens* is used in bio-stoning.
a) Amylase b) Lipase c) Cellulase d) Phosphatase

II. State whether the following are true or false (5 × 1 = 5 Marks)

- Strains may be improved by subjecting them to mutagens like gamma radiation or alkylating agents.
- Corn steep liquor is a by-product of starch extraction from maize.
- Ammonium sulphate is commonly used in the process of adsorption in downstream processing.
- Reichstein process is related to the production of ethanol.
- Zeolites have been used for enzyme immobilization.

III. Complete the following

(5 × 1 = 5 Marks)

- _____ producers can be screened using starch agar, and detected by clear zone on iodine staining.
- A riser and a downcomer are components of _____ fermenter.
- After liquid-liquid extraction, the solvent-rich product is called the extract and the residual liquid from which solutes have been removed is called the _____.
- The widely used Microorganism to produce glutamic acid is _____.
- Microbial _____ are used to obtain PUFAs from animal and plant lipids such as tuna oil and borage oil.

IV. Answer the following within 50 words (5 × 1 = 5 Marks)

- Define cryopreservation.

17. Mention an advantage of a fluidized bed bioreactor.
18. Give an example of an anion exchanger.
19. Expand PLP.
20. What are alkaline proteases? Mention an application.

PART – B (5×8 = 40 Marks)

Answer the following each within 500 words.

Draw diagrams and flowcharts wherever necessary.

21. (a) Outline the characteristics of industrially important microorganisms.

OR

- (b) Write a note on carbon and nitrogen sources commonly used in media.

22. (a) Describe a typical stirred tank bioreactor and explain the function of each part.

OR

- (b) Design a suitable bioreactor to produce bioethanol from algae.

23. (a) Give an account on the methods of cell disruption.

OR

- (b) Liquid-liquid extraction is a suitable method of extraction of antibiotics from fermented broths. Justify.

24. (a) Briefly outline the different steps in the streptomycin production.

OR

- (b) Write a short note on production of riboflavin.

25. (a) Outline the production and recovery of lipase. Add a note on its applications.

OR

- (b) Discuss enzyme immobilization and its industrial applications.

PART – C

Answer any TWO of the following, each within 1500 words. (2×20 = 40 Marks)

Draw diagrams and flowcharts wherever necessary.

26. Explain the following types of fermentation processes – batch, fed-batch and continuous.
27. Explain the various steps involved in downstream processing.
28. Explain in detail the microbial production process of vitamin C.
29. Explain the technique of isolation and production of biofertilizers using *Azotobacter* and *Rhizobium*.

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