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Question Paper Code: R3905

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2024

Third Semester

Chemical Engineering

R21UCH305-FERMENTATION TECHNOLOGY

(Regulation R2021)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (10 x 1 = 10 Marks)

- Which of the following is a product of alcoholic fermentation? CO1 -U
(a) Metal alloys (b) Organic polymers
(c) Inorganic minerals (d) Synthetic fibers
- Yeast carries out fermentation mainly to _____ CO1 -U
(a) Produce energy (b) Absorb oxygen
(c) Break down glucose (d) Release carbon dioxide
- A culture medium should ideally be _____ CO1 -U
(a) Inert (b) Porous (c) Solid (d) Nutritive
- Which of the following is a desirable characteristic for a transport medium? CO1 -U
(a) High nutrient content (b) Selectivity
(c) Ease of sterilization (d) Maintaining viability of pathogens
- Which of the following is not a primary goal of bioprocess engineering? CO1 -U
(a) Optimizing microbial growth conditions
(b) Designing fermentation vessels
(c) Developing new antibiotics
(d) Scaling up production from laboratory to industrial scale
- In a fermentation process, the primary function of a bioreactor is to: CO1 -U
(a) Maintain a sterile environment (b) Provide nutrients to the microorganisms
(c) Control temperature and pH (d) All of the above

7. Which type of fermentation process involves the complete utilization of oxygen by microorganisms? CO1 -U
- (a) Anaerobic fermentation (b) Aerobic fermentation
(c) Facultative fermentation (d) Micro aerophilic fermentation
8. In a continuous fermentation process, which parameter is typically kept constant? CO1 -U
- (a) Temperature (b) pH (c) Flow rate (d) All of the above
9. Which of the following is a characteristic of fermented foods? CO1 -U
- (a) They are always sweet (b) They are usually high in vitamins.
(c) They contain no bacteria. (d) They are made with only yeast.
10. Which process is used to make the alcoholic beverage known as beer? CO1 -U
- (a) Malolactic fermentation (b) Lactic acid fermentation
(c) Ethanol fermentation (d) Acetic acid fermentation

PART – B (5 x 2= 10Marks)

11. Define fermentation? CO1-U
12. What are the basics of culture media? CO1-U
13. Explain the role of a fermentor in microbial fermentation processes. CO1-U
14. Name two common types of microorganisms used in fermentation processes. CO1-U
15. What is the primary microorganism responsible for the fermentation of yogurt? CO1-U

PART – C (5 x 16= 80Marks)

16. (a) Analyze the different types of fermentation according to the final products CO2 App (16)
- (Or)
- (b) Describe the isolation of industrially important microorganisms CO2 App (16)
17. (a) Identify the essential criteria for culture media? Explain CO1 U (16)
- (Or)
- (b) (i) Explain the concept of scale-up in industrial microbial processes. CO1 U (8+8)
- (ii) Develop the Strategies for Successful Scale-Up of industrial microbial process.
18. (a) Explain the roles and responsibilities of bioprocess engineer. CO1 U (16)
- (Or)
- (b) Illustrate the importance of bioprocessing in a fermentation technology. CO1 U (16)

19. (a) Describe and compare the main types of fermentors used in industrial bioprocessing CO1 U (16)
- (Or)
- (b) Explain the primary methods of fermentation, including batch fermentation, fed-batch fermentation, and continuous fermentation. For each method, discuss the operational principles, advantages, limitations, and typical applications. CO1 U (16)
20. (a) Explain the principles of food fermentation, including the types of microorganisms involved. CO1 U (16)
- (Or)
- (b) Explain the factors that influence each stage of mushroom farming, such as substrate composition, environmental conditions, and the role of microorganisms. CO1 U (16)

