

(6 pages)

Reg. No. : .....

Code No. : 5552

Sub. Code : ZMBM 42

M.Sc. (CBCS) DEGREE EXAMINATION,  
APRIL 2024.

Fourth Semester

Microbiology - Core

FERMENTATION AND INDUSTRIAL  
MICROBIOLOGY

(For those who joined in July 2021-2022)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. What is the most common method of sterilizing culture media?  
(a) filtration  
(b) chemical sterilization  
(c) incineration  
(d) autoclaving

2. Soy meal, peptone and tryptone are used as the source of \_\_\_\_\_  
(a) carbon source  
(b) nitrogen source  
(c) carbon and nitrogen source  
(d) none of the above
3. The small scale bioreactors have volume of \_\_\_\_\_  
(a) 5-10 litres (b) 10-20 litres  
(c) 1-10 litres (d) 1-20 litres
4. The aeration is mainly provided to organisms present in  
(a) solid state culture (b) submerged culture  
(c) surface culture (d) batch culture
5. Alcoholic fermentation is carried out by which of the following yeast \_\_\_\_\_  
(a) *Lactobacillus*  
(b) *E. coli*  
(c) *Bacillus*  
(d) *saccharomyces cerevisiae*

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6. Which of the following is the process of converting sugar into alcohol?  
(a) Oxidation (b) pasteurization  
(c) bleaching (d) fermentation
7. The most commonly used bioreactors are \_\_\_\_\_  
(a) stirring type (b) sparged type  
(c) aerobic type (d) both (b) and (c)
8. The downstream Processing occurs after \_\_\_\_\_  
(a) Biosynthetic phase (b) separation phase  
(c) Purification phase (d) all of these
9. *Bacillus thuringiensis* is used as \_\_\_\_\_  
(a) insecticide (b) fungicide  
(c) microbicidal agent (d) rodenticide
10. The enzyme which hydrolyses starch to maltose is \_\_\_\_\_  
(a) protease (b) amylase  
(c) lactase (d) maltase

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Prepare growth and product formation in industrial process.  
Or  
(b) Show historical development of industrial microbiology.
12. (a) Recommend basic components and function of fermenter.  
Or  
(b) Justify principle of fermenter design.
13. (a) Apply lab and Pilot scale fermentor.  
Or  
(b) Analyze types of fermenter.
14. (a) Organize application of downstream processing.  
Or  
(b) Discuss processing and uses of chromatography in down stream.

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15. (a) Show principle of immobilization

Or

(b) Assume production of amino acid  
(L-Glutamic acid)

PART C — (5 × 8 = 40 marks)

Answer ALL the questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Assess raw materials in industrial fermentation and its role.

Or

(b) Show strain improvement techniques.

17. (a) Determine microbial growth kinetics.

Or

(b) Design involved in Stages of fermentation.

18. (a) Develop process of submerged and solid state.

Or

(b) Interpret structure of fermentor and its uses.

19. (a) Create limitations and application of downstream processing.

Or

(b) Predict solvent extraction method in downstream processing.

20. (a) Formulate production of Beer.

Or

(b) Criticize organic acids (Lactic acid).