

**B.Sc. MICROBIOLOGY  
SIXTH SEMESTER  
INDUSTRIAL MICROBIOLOGY  
BMB-601**

**SET  
A**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

( Objective )

Marks: 20

Choose the correct answer from the following:

1 × 20 = 20

- Black strap molasses is obtained from:
  - Whey
  - Maize
  - Sugarcane
  - Casein
- Glutamic acid is produced by:
  - Corynebacterium
  - Recombinant proteins
  - Pyrococcus sp.
  - Yeast
- An example of exopolysaccharide is:
  - Galactosidase
  - Hydrolyzed molasses
  - Xanthan gum
  - None of the above
- A commonly used mold in citric acid manufacturing is:
  - Aspergillus fumigatus*
  - Aspergillus terreus*
  - Aspergillus niger*
  - Aspergillus flavus*
- In fermenters oxygen transfer and dispersions are provided by:
  - Motor
  - Spargers and impellers
  - Only sparger
  - None of the above
- For industrial production of alcohol temperature should be:
  - < 27 C
  - > 30 C
  - < 20 C
  - > 50 C
- During conversion of acetaldehyde to ethanol the enzyme involved is:
  - Ethanol synthase
  - Alcohol synthase
  - Acetaldehyde dehydrogenase
  - Alcohol dehydrogenase
- If mycelium is loose, filamentous with limited branches, the amount of citric acid production will:
  - Double
  - Triple
  - 20-25%
  - Zero
- Precursor for penicillin biosynthesis is:
  - Ammonium sulfate
  - Lactose
  - Phenylacetate
  - Acetyl transferase
- Example of high yielding penicillin strain is:
  - Q167
  - Q176
  - Q376
  - Q12

11. The father of industrial fermentation is:
  - a. Louis Pasteur
  - b. Alexander Fleming
  - c. Chaim Weizmann
  - d. None of the above
12. Microencapsulation is a type of:
  - a. Adsorption
  - b. Covalent binding
  - c. Cross linking
  - d. Entrapment
13. Grinding with glass beads is a..... method.
  - a. Centrifugation
  - b. Cell disruption
  - c. Adsorption
  - d. Crystallization
14. Compounds with molecular weight less than 1000 (eg. Lactose) can be separated by:
  - a. Microfiltration
  - b. Reverse osmosis
  - c. Ultrafiltration
  - d. None of the above
15. Lysozymes hydrolyses..... in bacterial cell walls.
  - a.  $\beta$ -1,4-glycosidic bonds
  - b.  $\beta$ -1,6-glycosidic bonds
  - c.  $\beta$ -1,4,5-glycosidic bonds
  - d. None of the above
16. Bed of solid particles with biocatalysts within solid matrix constitutes:
  - a. Fluidized bed bioreactor
  - b. Packed bed bioreactor
  - c. Bubble column bioreactor
  - d. Tower bioreactor
17. During production of Vit B12 riboflavin is related to:
  - a. Aerobic phase
  - b. Anaerobic phase
  - c. Both a and b
  - d. None of the above
18. Penicillin is produced from:
  - a. Amino adipic acid
  - b. Succinyl Co. A
  - c. Glucose
  - d. Starch
19. GRAS means:
  - a. Generally recognized as safe
  - b. Genetically recognized as safe
  - c. Generally recorded as safe
  - d. Genetically regarded as safe
20. An example of a fungi where parasexual cycle is observed is:
  - a. Aspergillus
  - b. Yeast
  - c. Penicillium
  - d. Both a and c

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**(Descriptive)**

Time : 2 hr. 30 mins.

Marks : 50

[ Answer question no.1 & any four (4) from the rest ]

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| 1. Draw a neat labelled diagram of a conventional bioreactor. Discuss its features briefly.  | 10     |
| 2. Define strain improvement. Discuss briefly the recombinant DNA technology for improvement of industrially important microorganisms. | 2+8=10 |
| 3. Write short notes on:<br>a) Culture collection centres<br>b) Features of industrially important microorganisms                      | 5+5=10 |
| 4. Draw the flowchart of downstream processing. Explain the solid liquid separation methods used in downstream processing.             | 3+7=10 |
| 5. Describe briefly the different methods of Immobilisation of enzymes and cells with suitable diagram.                                | 10     |
| 6. Describe briefly the industrial production of ethanol.  | 10     |
| 7. a) Draw the flowchart for Biosynthesis of Citric acid production.<br>b) Describe the fermentation process for fungal amylases.      | 5+5=10 |
| 8. Write short notes on:<br>a) Molasses and Corn steep liquor<br>b) Selective isolation of mutants                                     | 5+5=10 |

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