REV-01
BBT/12/15

2022/12

SET B

B.Sc. BIOTECHNOLOGY
FIFTH SEMESTER
INDUSTRIAL FERMENTATIONS
BBT-501
[USE OMR FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

(Objective)

Time: 30 mins. **Marks: 20**

Choose the correct answer from the following: ***1×20=20***

1. In the growth equation: n = 3.3 (log10 N – log10 No), n stands for_____.
   a. Total population
   b. Number of generations
   c. Initial population
   d. Growth constant
2. Example of recombinant protein is/are:
   a. Insulin
   b. Interferon
   c. Interleukins
   d. All of the above
3. For disruption of Yeast cells walls following enzymatic combinations are used:
   a. glucanase+ mannanase+protease
   b. glucanase+sucrase+mannanase
   c. mannanase+protease+catalase
   d. protease+catalase+mannanase
4. In Falling film evaporators:
   a. Liquid flows over plates
   b. Liquid flows down a long tube
   c. Liquid films mechanically driven
   d. None of the above
5. Desirable alleles of two or more strains → Single strain → Product yield/generate new product. It is called:
   a. Mutation
   b. Recombination
   c. Genetic engineering
   d. None of the above
6. Hydroxylation reaction involved:
   a. Removal of Hydrogen from the substrate
   b. Removal of Hydroxyl group (OH)from the substrate
   c. Addition of Hydrogen(H)to the substrate
   d. Addition of Hydroxyl group (OH)from the substrate
7. Bacteria secrete or produce secondary metabolites in_____ of growth curve.
   a. Death phase
   b. Log phase
   c. Stationary phase
   d. Lag phase
8. Streptomycin is purified by:
   a. Anion exchange chromatography
   b. Cation exchange chromatography
   c. Adsorption chromatography
   d. Gel permeation chromatography
9. The calcium carbonate added in the medium during fermentation of Lactic acid acts as:
   a. Salt
   b. Buffer
   c. Neutral solution
   d. All
10. Surface active agents are added to separate solid by which method?
    a. Filtration
    b. Precipitation
    c. Foam separation
    d. All

11. Which of the following raw materials are important for the production of glutamic acid?
    a. Glycerol
    b. Corn-steep liquor
    c. Tryptone
    d. Biotin

12. Xanthan gum is produced by:
    a. *Corynebacterium*
    b. *Pseudomonas*
    c. *Bacillus*
    d. None of the above

13. Which approach is related to "Inaccessible substrate converted into accessible form"?
    a. Product modification
    b. New substrate utilization
    c. Completely new metabolite
    d. Enhanced growth

14. An example of cationic detergent is:
    a. Triton X-100
    b. Cetyl trimethyl ammonium bromide
    c. Sodium lauryl sulfate
    d. All of the above

15. Reverse miceller system composed of:
    a. Stable aggregates of surfactant molecules
    b. Unstable aggregates of surfactant molecules
    c. Water in organic solvents
    d. Both a and c

16. The yield of the antibiotic depends upon_____.
    a. Age of the inoculum
    b. Only the pH of the medium
    c. Composition of the medium
    d. All of the above

17. Which of the following is a B-Lactam antibiotic?
    a. Sulphanillamide
    b. Penicillin
    c. Tetracycline
    d. Chloramphenicol

18. Amino acids are metabolites of pharmacological interest and it is produced industrially from microbes .It is the product of_____.
    a. Primary metabolism
    b. Secondary metabolism
    c. Both a & b
    d. None

19. The organism involved in Lactic fermentation is:
    a. Acetobacter
    b. Lactobacillus
    c. Leuconostoc
    d. None

20. The precursor of glutamic acid synthesis is:
    a. Lysine
    b. Acetyl CoA
    c. A Ketoglutarate
    d. Succinate

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Descriptive

Time : 2 hr. 30 mins. Marks : 50

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

1. Explain the biosynthesis pathway and production of Penicillin with a neat diagram. 10
2. Explain in detail the down streaming process of ion exchange recovery of biological product. 10
3. Describe mathematical derivation of batch culture and continuous culture. 5+5=10
4. Describe the industrial production of: 5+5=10
   a) Lipase b) SCP
5. Define downstream processing. Briefly explain the cell disruption methods of downstream processing. 2+8=10
6. Explain with a neat diagram the mechanism of Microbial fuel cell. 10
7. Describe the various ways of strain improvement. Explain the biosynthetic pathway and production of Citric acid. 2+8=10
8. a) Explain the various parts of a fermenter with a neat diagram. 5+5=10
   b) Describe the biosynthetic pathway and production process of ethanol.

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