



11. What is the main feature of aerobic fermentation?
  - a. Agitation
  - b. Aeration
  - c. rpm
  - d. All of the above
12. What is the substrate used for mushroom?
  - a. Wheat
  - b. Cane sugar
  - c. Straw manure
  - d. All of the above
13. The Continuous culture is a/an..... culture system.
  - a. Open
  - b. Closed
  - c. Isolated
  - d. Semi closed
14. Which growth phase is usually longer in continuous culture?
  - a. Log
  - b. Exponential
  - c. Stationary
  - d. Death
15. Which of the following fermenters are characterized by height to diameter ratio?
  - a. Tower fermenter
  - b. Airlift fermenter
  - c. Continuous fermenter
  - d. All of the above
16. Single cell protein is the production of:
  - a. Extracellular proteins
  - b. Fermentation waste products
  - c. Intracellular protein extraction
  - d. Metabolites
17. Which of the following is a downstream process?
  - a. Screening
  - b. Strain improvement
  - c. Media formulation
  - d. Product recovery
18. What are primary metabolites?
  - a. Synthesized during primary phase of cell growth
  - b. Synthesized during secondary phase of cell growth
  - c. Synthesized during death phase of cell growth
  - d. None of the above
19. Liquid liquid extraction involves the separation of molecules based on:
  - a. Differential solubility
  - b. Charge
  - c. Affinity
  - d. All of the above
20. Ammonium sulfate salts is most commonly used in down steam processing for:
  - a. Centrifugation
  - b. Precipitation
  - c. Evaporation
  - d. Chromatography

**( Descriptive )**

Time : 2 hr. 30 mins.

Marks : 50

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

1. Write some properties of drug. Explain the biosynthetic pathway and production of Penicillin with a neat diagram. 2+6+2=10
2. Which are the enzymes responsible for the production of Citric acid? Explain the Biosynthetic pathway and production of Citric acid? Plot a graph if glucose supplemented: 150g/L, biomass yield:5g/L, Citric acid production 100g/L. 5+5=10
3. Explain diauxic growth curve. Define bacterial growth curve with a neat diagram. Describe the kinetics of continuous culture. 10
4. Describe the various media composition for the production required for the fermentation. Explain the various methods for strain improvement. 5+5=10
5. a) Describe primary and secondary metabolites. Explain the modern method of screening of metabolites. 5+5=10  
b) Explain the biosynthetic pathway and production of Alcohol.
6. What do you mean by fermentation and what is the relationship between fermentation and yeast? Justify your answer. Explain the design of a continuous stirred tank bioreactor with the help of a suitable diagram. Explain the importance of each part. Do you think there is any importance of improving the strain of microbe used for fermentation? Justify your answer. 2+7+1=10
7. Differentiate between batch fermentation and continuous fermentation. What will be the outcome of growth curve if the media contains a complex compound mixture of lactose and glucose? Explain solid substrate fermentation. What is the difference between a fluidised and packed bed bioreactor? Write a note on airlift bioreactors. 2+1+2+2+3=10
8. What are the different media components used during fermentation? Mention their importance. Define downstream processing. What are the steps involved? Mention their importance and method used for each stage. 3+7=10

= = \*\*\* = =