

2. Carbon cycle
3. Chemical and microbiological characteristics of wastewater.
4. Activated sludge process.

Q.III (A) Fill in the blanks (any four)**(04)**

- 1) In _____ phase of batch fermentation the growth rate of cells is independent of the substrate concentration as long as excess substrate is formed..
- 2) In _____ process substrate is added in increments as the fermentation progresses.
- 3) The production of vinegar utilizes various _____ species to oxidize ethanol to acetic acid.
- 4) _____ is a cryoprotective agent.
- 5) _____ screening gives the information regarding the spectrum of microorganisms which is sensitive to a newly discovered antibiotic.
- 6) _____ is a situation where the end product of a biochemical pathway prevents the synthesis of an enzyme.
- 7) Cell growth is controlled by adjusting the concentration of one substrate in the _____.
- 8) _____ involves the freezing of a culture followed by its drying under vacuum which results in the sublimation of cell water.

Q.III (B) Explain (any two) of the following**(04)**

- 1) Diauxy
- 2) Subculture
- 3) Primary Screening
- 4) Co-operative feedback control

Q. III (C) Answer (any two) of the following.**(12)**

- 1) What do you mean by submerged fermentation? In brief explain the process of gluconic acid production?
- 2) Elaborate on the method used for the long term preservation of microorganisms.
- 3) Mention the differences between batch and continuous fermentation
- 4) How would you primarily screen an extracellular metabolite producing microorganisms?

Q.IV Write short notes (any three) of the following**(15)**

1. Cavitator
2. Imhoff tank.
3. Nitrogen fixation.
4. Life cycle of T4 phage.
5. Somatostatin production with reference to application of biotechnology in medical science.
6. Exponential phase