

- Note :-
- All questions are compulsory.
 - Draw diagrams wherever necessary.

Q. 1 A) Explain the following terms. (any four)

- 1) Baffles
- 2) GILSP
- 3) Fed batch fermentation
- 4) Impeller
- 5) Roll - Bottle technique
- 6) Inoculum development
- 7) Solid state fermentation
- 8) Pitch

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B) Answer (any two) of the following.

- 1) Describe the operations carried out to achieve aseptic conditions during fermentations. Add a note on Containment.
- 2) Describe the different types of aerators.
- 3) Explain submerged fermentation using suitable example.
- 4) Write a note on continuous fermentation.

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Q. 2 A) Define the following terms. (any four)

- 1) Mean growth rate constant
- 2) pH
- 3) Alkalophile
- 4) Hyperthermophile

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B) State whether the following statements are true or false and if false, correct the statement. (any two).

- 1) Exponential phase is a unbalanced growth.
- 2) In turbidostat, the essential nutrient is in limiting quantities.
- 3) The enzyme, catalase, catalyzes the destruction of superoxide radicals.
- 4) Gamma rays and X-rays are non-ionizing radiations.

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C) Answer (any two) of the following.

- 1) Why do shift-up and shift-down experiments cause cells to enter unbalanced growth?
- 2) Briefly describe technique by which microbial population mass may be determined.
- 3) What metabolic and structural adaptations for extreme temperatures do psychrophiles and thermophiles have?
- 4) How do microorganisms protect themselves against damage from U.V. and visible light?

Q. 3 A) Fill in the blanks. (any four)

- 1) Ions bound electrostatically to exchanger are referred to as _____.
(Cations, anions, counterions, nascent ions)
- 2) First detailed description of chromatography is credited to _____.
(Rosalind Franklin, Michael Tswett, Albert Einstein, Karry Millis)
- 3) _____ imparts colour to the compound.
(Auxochrome, Monochrome, Polychrome, Chromophore)

- 4) A beam in which all rays have same wavelength is known as _____.
(Polychromatic, Monochromatic, Chromatic, U.V.)
- 5) Packet of energy is called _____. (Photons, Quanta, Power packs, Neutrinos)
- 6) _____ hold the sample in spectroscopy.
(Containers, Test tubes, Cuvettes, Suspension tubes)
- 7) When a _____ solvent is used as an eluent during development, it is known as isocratic separation. (double, single, Triple, Multiple)
- 8) Gel permeation allows almost _____ % solute recovery. (90%, 25%, 99%, 100%)

B) Define the following terms. (any two)

- 1) Partition Co-efficient
- 2) Diffraction pattern
- 3) Auxochrome
- 4) Flow rate

C) Answer (any two) of the following.

- 1) Ion exchange chromatography for counter ion exchanging.
- 2) Gel permeation chromatography.
- 3) Instrumentation of U.V. - Visible spectrophotometry.
- 4) State Beer-Lambert's law and elaborate with an example.

Q. 4 Write a note on (any three) of the following.

- 1) Solid state fermentation
- 2) Medium sterilisation
- 3) Effect of pressure on microorganisms
- 4) Measurement of cell growth using the Petroff-Hausser counting chamber
- 5) Absorption spectrum
- 6) HPLC

_____ The End _____