S.Y.B.T-I Sem-4

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

Q. 1 A) Explain the following terms. (any four) 8

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

B) Answer (any two) of the following. 12

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.

Q. 2 A) Define the following terms. (any four) 4

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

B) State whether the following statements are true or false and if false, correct the statement. (any two). 4

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.

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 seperation. (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 ——