

B.E. (Bio-Technology) Seventh Semester  
BIO-711: Environmental Biotechnology

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section. State clearly your assumptions.

x-x-x

Q. 1) Write briefly:

(1×10 =10)

- Define BOD and COD?
- What is the difference between MLSS and MLVSS?
- What is acid rain?
- What is recirculation ratio?
- What is incineration?
- Name few organism involved in MEOR.
- Which bacteria help in desulfurization of coal?
- What is nucleic acid hybridization?
- How sludge retention time is different from hydraulic retention time?
- What are the limitations of BOD test?

SECTION - A

- Briefly describe design criteria of screen and grit chamber for waste water treatment.
  - With a neat sketch explain the working principle and design criteria of UASB. (5, 5)
- UASB treatment process treating industrial wastewater, determine the (i) size and dimensions of the reactor and (ii) detention time, given: Flow rate ( $Q$ ) = 1200 m<sup>3</sup>/day, COD (Influent)  $S_o$  = 2200 g/m<sup>3</sup> = 2.2 kg COD/ m<sup>3</sup>, Average organic loading = 10 kg COD/m<sup>3</sup>.d, Reactor volume effectiveness factor = 90%, Wastewater upflow velocity = 1.5 m/h.
  - Draw oxygen sag analysis curve, write the basic Streeter – Phelps equation to describe and predict the behaviour of polluted stream. From this equation, determine critical travel time and critical deficit. (5, 5)
- Differentiate

  - High and low rate trickling bed filter
  - Aerobic and anaerobic treatment processes. (5, 5)

SECTION - B

- Write short notes on:

  - Microbial petroleum extraction.
  - Composting.
  - Bio-filtration. (4, 3, 3)
- Why microbial desulfurization of coal is important in environmental aspects? Give example with reactions.
  - What are the safeties need to be followed for handling biohazardous wastes? (6, 4)
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  - What are the factors influencing solid waste management? (5, 5)

x-x-x