

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.

x-x-x

1. Write briefly;

(1 × 10 = 10)

- a) What is the difference between MLSS and MLVSS?
- b) How grit chamber is different from sedimentation tank?
- c) What is acid rain?
- d) How biofiltration is different from bioremediation?
- e) What are the limitations of BOD test?
- f) How sludge retention time is different from hydraulic retention time?
- g) What is recirculation ratio?
- h) Explain limitations of anaerobic treatment process.
- i) Which bacteria play important role in coal minning?
- j) What is proportional weir?

SECTION-A

2. A) 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.
B) If the 4 day, 15°C BOD is 200 mg/l, what will be its 7 day BOD at 25°C? Waste water of flow rate 6.0 m³/sec is discharged into a river of flow 80m³/sec. The ultimate BOD of waste water is 250 mg/l and DO is 2.0 mg/l. River water has a BOD of 5 mg/l and DO of 10mg/l. BOD reaction rate constant is 0.5/day and DO deficit reduction constant is 0.25/day. River has a cross sectional area of 300 m² and saturated DO concentration of the river water is 10 mg/l
i) What will be the DO of the mixture at a distance of 20 Km
ii) Where does the minimum DO occur? Sketch DO sag curve and describe the salient features.

(4, 6)

3. A) How and why genetically engineered microorganisms can be utilized for bioremediation?
B) Differentiate In-situ and Ex-situ bioremediation.

(5, 5)

P.T.O.

(2)

4. A) What are the design criteria and working principle of UASB?
B) Explain the working and design criteria of septic tank.

(5, 5)

SECTION-B

5. A) What are different methods of solid waste disposal? Discuss composting in brief.
B) Explain the importance of biomining process over chemical mining methods citing specific examples.

(5, 5)

6. A) What are IFT reduction, selective plugging, Huff and Puff techniques in MEOR?
B) What are the standard methodologies available for handling biohazardous wastes?

(5, 5)

7. Write short notes on,

- i) T-RFLP to study complex microbial communities
ii) Use of Microarray in environmental Biotechnology

(5, 5)

x-x-x