

**M.Sc. DEGREE II SEMESTER EXAMINATION IN ENVIRONMENTAL TECHNOLOGY,
APRIL 2008**

ENB/ENV 2202 ENVIRONMENTAL ENGINEERING

Time : 3 Hrs.

Maximum marks : 50

PART – A

(Answer ANY FIVE questions)
(All questions carry EQUAL marks)

(5 x 2 = 10)

- I.
1. What are the beneficial uses of water?
 2. Differentiate between pre-chlorination and post-chlorination.
 3. What do you understand by the terms “Yield Coefficient”, “Substrate Utilization” and “Food to Microorganism ratio” in biological processes?
 4. What is a “Wind Rose”? What are its uses?
 5. Write a note on “Radon pollution” with reference to indoor air quality.
 6. How is the airport noise evaluated?

PART – B

(Answer ANY FIVE questions)
(All questions carry EQUAL marks)

(5 x 3 = 15)

- II.
1. Explain what you understand by ‘Acute Toxicity’ and ‘Chronic Toxicity’. How are they estimated?
 2. Determine the terminal settling velocity of a 100 μm particle in water at 22°C. The specific gravity of the particle is 2.5. Assume that $\beta=0.9$. What is the velocity if the particle is settling in air at the same temperature?
 3. What are ‘Water-quality limited’ and ‘Effluent Limited’ streams?
 4. What is lapse rate? Explain positive and negative lapse rates.
 5. Under what industrial plant conditions would you recommend the use of a “baghouse”?
 6. What are “Hazardous Wastes”? Name some of the characteristics of hazardous wastes.

PART – C

(Answer ANY FIVE questions)
(All questions carry EQUAL marks)

(5 x 5 = 25)

- III.
1. Explain the procedure for collecting a water sample for analysis. What are the tests that need to be completed in the field itself? How do you ‘fix’ a water sample collected for analysis of dissolved oxygen?
 2. Explain the mechanisms by which water gets purified during filtration.
 3. A completely mixed activated sludge process is to be designed to treat 15,000 m^3/day of industrial waste containing 1250 mg/L of $\text{BOD}_{5,20}$. The effluent has to be treated to a level of 30 mg/L $\text{BOD}_{5,20}$. A treatability study found that a MCRT of 25 days is sufficient and that the unit could operate at a MLVSS of 6000 mg/L. $Y=0.07$ g/g and the k_d value=0.04 per day. The underflow concentration is 10000 mg/L. Calculate the volume of the reactor and the mass and volume of solids wasted per day.
 4. What do you understand by the terms “Heat Island Effect” and “Green House Effect”? Explain.
 5. Name some of the equipments used for control of particulates in air. Explain with an example process modification as a control option for air pollution.
 6. What are the major groups of microorganisms involved in a composting operation? How do they contribute to the stabilization of the solid waste?