

**M.Sc. DEGREE II SEMESTER EXAMINATION IN ENVIRONMENTAL TECHNOLOGY,
MAY 2006**

ENB 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 is the upper limit for ammoniacal nitrogen in water to be discharged into (i) inland and surface water (ii) land for irrigation ? What, in your opinion, is the reason for the difference ?
2. What is coagulation ? Name two commonly used coagulants.
3. How does the endogenous decay process affect the specific growth rate of a microbial consortium ?
4. What are the meteorological parameters that affect air pollution ?
5. What are the common equipment used for collection of aerosols ?
6. What are the methods used for controlling noise pollution from industries ?

PART – B

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

(5 x 3 = 15)

- II. Explain what you understand by 'acute toxicity' and 'chronic toxicity'. How are they estimated ?
- III. Explain the rationale behind the design of rapid sand filters based on per capita water consumption.
- IV. Why is it necessary to treat sludges generated in waste water treatment plants before disposal ? What are the various ways of doing this ?
- V. Describe the functioning of a high volume sampler for estimation of suspended particulate matter.
- VI. How does a catalytic converter reduce air pollution due to automobile exhaust emissions ?
- VII. How does a hazardous waste landfill differ from a sanitary landfill ?

PART – C

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

(5 x 5 = 25)

- VIII. What are 'indicator organisms' ? Why are they called so ? Compare the multiple tube method and the colony count method for enumeration of total coliforms in a sample of water/waste water.
- IX. How will you design a continuous clarifier using data from a batch sedimentation experiment ? Explain.
- X. The effluent generated by an industry has a total (and soluble) BOD_5 of 1000 ppm. It is to be treated in an activated sludge process with a complete-mix aeration tank having a total volume of $25m^3$. The design value of MLVSS is 3000 mg.l^{-1} and the design SRT, 4 days. For the aerobic sludge to be used in the process, $Y_{x/s}$ is 0.6 g cells per g BOD_5 and the endogenous decay rate constant is 0.05 per day. If the industry generates $80\text{ m}^3.\text{d}^{-1}$ of effluent, will this design suffice to reduce its BOD_5 value to below 30 ppm ? If not, give your recommendations for achieving a final BOD_5 of 30 ppm or below.
- XI. What is a wind rose ? Elaborate its importance with respect to air pollution studies.
- XII. Describe the working a venture scrubber. What are its typical applications ?
- XIII. What are the major groups of microorganisms involved in a composting operation ? How do they contribute to the stabilization of the solid waste ?