

**M.Sc. DEGREE II SEMESTER EXAMINATION IN ENVIRONMENTAL TECHNOLOGY,
APRIL 2010**

ENV/ENB 2202 ENVIRONMENTAL ENGINEERING

Time : 3 Hours

Maximum Marks : 50

PART – A

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

(5 x 2 = 10)

- I. (a) What is the significance of Water (Prevention and Control of Pollution) Act and Rules?
 (b) State the NRC equation for a single stage trickling filter.
 (c) Why sludge has to be recycled to the reactor in an Activated Sludge process?
 (d) Name the different processes employed for recovery of resources and energy from solid wastes.
 (e) Briefly explain the terms 'Ambient Lapse Rate' and 'Adiabatic Lapse Rate'.
 (f) How is noise measured? What is the commonly used unit?
 (g) Explain the principle of a Baffled Gravitational Settling Chamber.

PART – B

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

(5 x 3 = 15)

- II. How a Cation Exchange resin works?
 III. What is meant by Alkalinity of water? How is it measured?
 IV. Write notes on any two of the following:
 (i) Indicator organisms
 (ii) Yield (Growth Yield), Y
 (iii) MLVSS
 V. Explain the action of chlorine as a disinfectant.
 VI. What are the three types of combustion employed in industries for pollution control? Briefly explain their features.
 VII. What is the difference between a Surface Condenser and a Contact Condenser? Briefly explain the features of the two types of condensers.
 VIII. Bring out the salient differences between a Packed Tower and a Sieve Plate tower used for absorption.

PART – C

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

(5 x 5 = 25)

- IX. Explain the working of different types of settling Tanks for waste water.

(Turn Over)

- X. An effluent has the following characteristics. It is to be treated by Activated Sludge process.

Flow rate	: 80 Me per day
Total (all soluble) BOD5	: 1000 mg/L
Volume of aeration basin	: 25 M3
MLVSS concentration in basin	: 3000 mg/L
Mean cell residence time	: 4 days
Yield, Y	: 0.6 g cells/g of BOD5
Endogenous decay rate constant Kd	: 0.05 per day

What will be the BOD5 of the treated effluent?

- XI. Write short notes on any three of the following:

- (i) Monod equation for growth rate
- (ii) Hydraulic Residence Time, θ
- (iii) Effect of ammonia in water during chlorination
- (iv) Regeneration of Ion Exchange Resin

- XII. What are the different types of equipment used for removal of gaseous pollutants from air? With sketches, explain the working of any two of the equipment.

- XIII. Explain the different types of landfills for solid wastes, with the help of neat diagrams

- XIV. Describe any three types of reactors with sketches.

- XV. Write short notes on any three of the following:

- (i) Indoor Air quality
- (ii) Zero-order reaction and First-order reaction
- (iii) Composting
- (iv) Fluoro-carbons as air pollutants.