Time: 3 Hours   **Total Marks: 80**

N.B.:
  (i)   Question No.1. is compulsory.
  (ii) Attempt any three questions out of remaining five questions.
  (iii) Assume suitable data and justify the same.
  (iv) Figures to the right indicate full marks.

1. (a)   Briefly discuss the Hydrologic Cycle.   04
   (b)   Explain the effects of the following: 06
         (i)   Ozone layer depletion
         (ii) Oxides of sulfur
   (c)   Define the terms: MLSS and DO. Explain their significance in   06
         wastewater treatment.
   (d)   Explain the methods of collection of solid waste.   04

2. (a)   Describe the use of adsorption system for recovery of solvent vapors   10
         from an air streams. Explain the selection of adsorbents & regeneration
         methods used.
   (b)   The town of Venkatapur discharges 17,360 m^3/d of sewage into a nearby   10
         stream. The stream has a minimum flow of 0.4 m^3/s, depth of 2.5 m and a
         velocity of 5 kmph. Other information pertaining to the stream and the
         sewage are as follows:

	Temp (^{0}C)	DO (mg/l)	BOD_5 (mg/l)
Stream	20	8.5	10
Sewage	25	1.0	200

         The deoxygenation constant (k_1) evaluated at 20^0C = 0.35 d^{-1}. Determine
         the critical oxygen deficit, D_c, and its location, X_c.

3. (a)   Describe the various methods available for the removal of nitrogen &   10
         phosphorus from waste water.
   (b)   A plate-type electrostatic precipitator for use in a cement plant for   10
         removing dust particles consists of 10 equal channels. The spacing
         between the plates is 0.15 m, and the plates are 2 m high and 2 m long.
         The unit handles 10,000 m^3/hr of gas. What is the efficiency of
         collection? What should be the length of the plates for achieving 99%
         collection efficiency if other condition are the same?

68175   Page **1** of **2**

4. (a) Explain BOD test used for analysis of water pollutant in waste water. 10
Explain the method to obtain ultimate BOD of the sample.

(b) The behavior of particulate pollution in the atmosphere is influenced by 10
their relative sizes. Explain how the size of a particulate makes a
difference?

5. (a) Describe any one method for the design of a thickener for the case of 10
zone settling.

(b) Describe the operation of a typical facultative pond. Discuss the basic 10
reactions taking place in a facultative pond and the transfer of materials
between the various zones of the pond.

6. Write short notes on any four:- 20
(i) Eutrophication in lakes
(ii) Dispersion model
(iii) Electrostatic precipitator
(iv) Hazardous Waste Management
(v) Noise Pollution Control

****