M.Sc. DEGREE II SEMESTER EXAMINATION IN
ENVIRONMENTAL TECHNOLOGY
MAY 2005

ENV 2202 ENVIRONMENTAL ENGINEERING

Time : 3 Hours   Maximum Marks: 50

PART - A

(Answer *any five* questions)
(All questions carry *equal* marks)

$(5 \times 2 = 10)$

I. 1.   State the permissible limits for 'nitrate' and 'fluoride' in potable water.
        Mention the ill-effects when they are not in the permissible limits.

   2.   What is meant by 'disinfection' in treating public water supply?

   3.   Define 'sludge volume index'.

   4.   Differentiate between 'Adiabatic lapse rate' and 'Environmental lapse
        rate'.

   5.   Mention the major sources of 'SO_x' and 'NO_x'.

   6.   What do you understand by 'Threshold of hearing'?

PART - B

(Answer *any five* questions)
(All questions carry *equal* marks)

$(5 \times 3 = 15)$

II.   What is meant by Hardness of water? How it is determined in
        the laboratory? Explain.

III.   "In sedimentation tanks, area and the overflow rate rather than
        the detention period should govern the design." - Comment on
        the statement.

IV.   What do you understand by the efficiency of a trickling filter? How do
        you determine the efficiency, using (i) NRC formulae and (ii) Velz equa-
        tion?

V.   Explain the working of 'Electrostatic precipitator' with the help of
        a neat sketch.

(Turn Over)

VI. What mathematical formulae are used to describe the atmospheric diffusion process? Describe Gaussian equation.

VII. Discuss briefly the disposal of refuse by incineration.

PART - C
(Answer *any five* questions)
(All questions carry *equal* marks)

$(5 \times 5 = 25)$

VIII. Explain the importance of bacteriological tests in determining the quality of drinking water. Also explain the *E.coli* test.

IX. Design a set of rapid sand gravity filters for treating water required for a population of 50,000 the rate of supply being 180 litres/day/person. The filters are rated to work 5000 litres/hour/m². Assume any other data required.

X. Determine the effective height of a stack, with the following data:-

    (a)   Physical height is 180m with 0.90 m inside decimeter.
    (b)   Wind velocity is 2.8 m/sec.
    (c)   Air temperature is 27°C.
    (d)   Barometric pressure is 1000 millibars.
    (e)   Stack gas velocity is 11.15 m/sec.
    (f)   Stack gas temperature is 170°C.

XI. With the help of a neat sketch explain the working of a sludge digestion tank and the sludge digestion process.

XII. Explain the absorption and adsorption processes for the control of gaseous pollutants..

XIII. What are sources of industrial noise pollution? Explain how it is controlled.

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