Total number of printed pages – 4 **B. Tech**

HSSM 4403

Eighth Semester Examination – 2008

ENVIRONMENTAL ENGINEERING

Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*

The figures in the right-hand margin indicate marks.

1. Explain in brief : 2 ×10

   (i) Criteria pollutants

   (ii) Oxygen sag curve

   (iii) Anaerobic digestion

   (iv) Environmental gradients

   (v) Bio-solids

   (vi) Ultimate BOD

   (vii) Maximum mixing depth

   (viii) Sludge volume index

   (ix) National ambient air quality standards

   (x) Energy budgets.

   (a) List the four factors that reduce the amount of direct runoff. 4

   (b) Show the flow of energy in an ecosystem with the help of neat line diagram. 6

   (a) What objections could be there if turbidity and chlorides are present in excess in water ? 4

   (b) The pH of two different samples collected from the effluents discharged from a steel plant and a power plant is found as below. Find the pH of their mixed sample. 6

   Steel plant : volume – 100 ml ; pH-6.0

   Power plant : Volume- 900 ml ; pH-5.0

4. Change in concentration of organic matter, L with time, t, is given by $\frac{dL}{dt} = -k.L$. Calculate the organic matter remaining after 3 days if the initial concentration was 200 mg per litre. $k = 0.4$ per day. 10

5. (a) Draw flow diagram of a modern water treatment plant and show the different units on it. 6

   (b) List four major air pollutants for which the Central Pollution Control Board of India designated ambient air quality standards. 4

6. (a) Define sludge volume index and explain its use in the design and operation of an activated sludge treatment plant. 6

   (b) Compute the mean sound level from the following four readings (all dBA) : 38, 51, 68 and 78. 4

7. (a) List four disposal techniques of hazardous wastes. 4

   (b) What type of collection devices would you propose for installation in a steel plant to collect particulate matters containing iron oxide, dust and smoke ? 6

8. (a) Explain how environmental impact assessment process is considered as a project management tool. 5

   (b) What are the benefits of adopting waste minimization techniques in industries ? 5

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