SPRING END SEMESTER EXAMINATION-2016

2nd Semester B.Tech & B.Tech Dual Degree

ENVIORNMENTAL SCIENCE

CH-1005

(Regular-2015 Admitted Batch)

Time: 3 Hours **Full Marks: 60**

Answer any SIX questions including Question No.1 which is compulsory.

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.

1. a) Arrange the greenhouse gases CO_2, N_2O, CH_4 and CFC as per their global warming potential. [2 × 10

   b) Provide both sources and sinks for NO_x.

   c) What do you mean by 'BOD' and 'COD'? For municipal sewage which one is higher and why?

   d) What is hardness? Can hard water be used in laundries? Justify your answer.

   e) Explain biomedicaland radioactive wastes with suitable examples.

   f) What do you mean by '3R Principle' in waste management?

   g) Explain structural components and chemical composition of lithosphere.

   h) Mention one toxic effect each due to Lead (Pb) and Cadmium (Cd).

i) Explain any two principles of green chemistry with suitable examples.

j) If the solar spectrum peaks at 0.48 μm, find the surface temperature of the sun assuming it to be a black body.

2. a) What do you mean by CFC? Explain the mechanism of its action in depleting the ozone from stratosphere. Also suggest the substitute of CFC used now-a-days. [4

b) Explain the working principle of three-way catalytic converter used in automobile exhausts. Also suggest one catalyst each for oxidation and reduction stages. [4

3. a) What is the importance of dissolved oxygen (DO) as water quality parameter? Explain the principle of Winkler's method for estimation of DO in a supplied water sample. [4

b) During estimation of DO by Winkler's method, a 50 ml water sample consumed 4.5 ml of 0.01N sodium thiosulphate as the end point reached. Calculate concentration of DO in mg/l. [4

4. a) Describe different types of solid wastes with suitable examples in each category. [4

b) Explain different techniques adopted for solid waste management in reference to collection segregation and disposal. [4

5. a) Describe the secondary treatment of waste water in reference to rotating biological contactor (RBC). [4

b) What is photochemical smog? Explain the formation of PAN in it which is an eye irritant. [4

6. a) Explain 'Atom- Economy with a suitable example. [4

b) What do you mean by 'R_4M_4 principles' in reference to ecno-burette? [4

7. a) Explain the biochemical effect of As(III) and Cd(II) on enzyme action. [4

b) What is a buffer? Explain buffer action with a suitable example. Suggest which type of buffer is suitable for estimation of hardness using Eriochrome Black-T as indicator. [4

8. a) What is Environmental Impact Assessment? Describe various steps involved to prepare Environmental Impact Assessment report. [4

b) Mercury is 58×10^9 m away from the sun and has albedo equal to 0.06. Find out the average surface temperature of mercury (Solar flux=9176.5 W/m^2).Stefan- Boltzmann constant $\sigma = 5.67 \times 10^{-8}$ $J.m^{-2}$ S^{-1} K^{-4}. [4

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