AUTUMN END SEMESTER EXAMINATION-2016

1st Semester B.Tech & B.Tech Dual Degree

ENVIORNMENTAL SCIENCE

CH-1005

(Regular-2016 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) Write the name of two coagulants usually used in the water treatment process? [2 × 10

   b) Briefly explain the sources and sinks for NO_X.

   c) What is TLV of a pollutant? Give one example.

   d) What is Lapse rate? Briefly explain the effect of Ozone on lapse rate of the atmosphere.

   e) What is the difference between primary pollutant and Secondary pollutant? Explain with suitable examples.

   f) What do you mean by R^4M^4 Model?

   g) What do you mean by Environmental Impact Assessment (EIA)?

   h) Write two characteristics of hazardous waste. Give one example of such type of waste material.

   i) Find the pH of a solution containing 150 mL of 0.1M HCl & 10 mL of 1M NaOH.

   j) Mention one toxic effect of each that is due to Cadmium(Cd) and Mercury(Hg).

2. a) Consider the Sun as a perfect sphere of radius 6.8×10^8m. If surface temperature of the Sun is 6000K, then calculate the energy radiated by the Sun per second. (Stefan Boltzman constant = $5.67 \times 10^{-8} Jm^{-2}S^{-1}K^{-4}$) [4

b) What is Albedo? Explain a simple radiation balance model that includes the Earth's Albedo. [4

3. a) How would you broadly divide the major regions of the atmosphere? State their respective altitude and temperature ranges. What are the important chemical species present in each region? [4

b) Give a brief account of the structural aspects of Lithosphere with an emphasis on its components and composition. [4

4. a) What is Photochemical smog? How does it differ from London smog? Discuss the possible mechanism of the reactions resulting in the formation of the photochemical smog. [4

b) What do you mean by CFC? Briefly explain the role of CFC on ozone layer depletion & remedial measures. [4

5. a) 100mL of water sample on titration with N/50 H_2SO_4 consumed 20mL upto Phenolphthalein end point. On continuation of the titration in presence of the methyl orange indicator, 40 mL of acid is consumed. Find the alkalinity of water in terms of $CaCO_3$ equivalent. [4

b) What do you mean by Biochemical Oxygen Demand (BOD)? Explain the 5 days BOD test in details. [4

6. a) What do you mean by solid waste? Discuss on the classification of solid wastes based on their origins with suitable examples. [4

   b) Briefly account for the solid waste disposal. [4

7. a) Discuss the working principles of electrostatic precipitator for removal of suspended particulates from polluted air. Also suggest which one is suitable for relatively fine particulates out of electrostatic precipitator and cyclonic collector. [4

   b) About 50ml of a water sample required 10ml of N/50 sulphuric acid using methyl orange as indicator but failed to develop any colour with phenolpthalein. Find the alkalinity and also comment on the type of alkalinity. [4

8. a) Briefly explain the basic principles of Green Chemistry with suitable example. [4

   b) Give a brief account on the matrices to express Greenness. [4

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