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Total No. of Pages : 02

Total No. of Questions : 08

M.Tech.(Ev.S & E) (Sem.–1)

ENVIRONMENTAL CHEMISTRY

Subject Code : ES-503

Paper ID : [E0991]

Time : 3 Hrs. Max. Marks : 100

INSTRUCTION TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWENTY marks.**

1. a) Describe in details about Biodegradability and Bioaugmentation.

   b) Briefly describe the aerobic treatment of waste water and the methods of determining the levels of wastes in the water.

2. a) Discuss in details the biochemical effects of oxides of Sulphur with chemical equations.

   b) Explain the difference between monitoring and analysis. How can the Suspended Particulate Matter (SPM) be monitored?

3. a) Comment on the statement *"Oxygen plays a major role in troposphere whereas ozone plays a significant role in stratosphere"*.

   b) Describe in details the Winkler's method for the determination of Dissolved Oxygen in water.

4. a) Write a short note on Fluoride toxicity. What are the analytical methods for measuring fluorine?

   b) What do you mean by complexation and Chelation processes? Discuss the applications of the two in Chemical coagulation and metals bioavailability.

5. a) Write a short note on waste management. Discuss briefly the disposal methods.

   b) Discuss in details the analytical methods for measuring air pollutants.

6. a) Discuss the anion redox equilibria in sea water. Give some examples of microbially mediated redox reactions in natural water. Support your answer with the help of chemical equations.

   b) Discuss the biochemical effects of Lead and Arsenic in details with chemical reactions involved.

7. a) Illustrate the concentration profile of CO, SO_2 and NO_x during 24 hrs of the day. Also discuss briefly CO, SO_2 and NO_2 monitors.

   b) What are anaerobic treatment processes? Show how organic waste matte undergoes breakdown.

8. a) Discuss the advantages and disadvantages of physio-chemical treatment of sewage as compared with biological treatment in details.

   b) What are Xenobiotic compounds? Briefly describe the various types of recalcitrant xenobiotic compounds and the environmental and human hazards from xenobiotics.