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Total No. of Pages : 02

Total No. of Questions : 15

M.Sc. (Chemistry) (2018 & Onwards) (Sem.–1) ENVIRONMENTAL CHEMISTRY Subject Code : CHL-405-18 M.Code : 75117

Time : 3 Hrs.

Max. Marks : 50

INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of FIVE questions carrying TWO marks each.
- 2. SECTION-B contains EIGHT questions carrying FOUR marks each and students have to attempt any SIX questions.
- 3. SECTION-C will comprise of TWO compulsory questions with INTERNAL CHOICE in both these questions. Each question carries EIGHT marks

SECTION-A

- 1. What is meant by photochemical smog? How is it formed?
- 2. List the classification of water pollutants.
- 3. State the Beer's law as applied to spectrophotometry.
- 4. Why is DO considered an important parameter for water pollution?
- 5. List any two methods for control of radiation.

SECTION-B

- 6. What are chlorofluorocarbons (CFC)? What are its major uses? Explain its significance in global atmospheric change.
- 7. Discuss the importance of the following constituents in wastewater :
 - a) Nitrogen and Phosphorous
 - b) Toxic inorganic compounds and Dissolved gases.
- 8. Discuss the analytical procedure for measurement of any two of the measures of organic content.
- 9. Explain the working principle of IR spectroscopy.
- 10. Define and explain the importance of Cation Exchange Capacity (CEC) of soil.

- 11. How do you decide the site for radioactive waste disposal from the point of view of soil pollution?
- 12. Explain how the radio activity measured.
- 13. Discuss the basic environmental chemistry associated with the "Minamata Disaster".

SECTION-C

14. Explain the concept of materials balance as applied to environmental systems. A stream flowing at 10m3/s has a tributary feeding into it with a flow of 5 m3/s. The stream has a conservative pollutant concentration of 10 mg/L above the confluence (meeting junction) and the tributary has a concentration of 20 mg/L of the same pollutant. Find the downstream concentration in combined stream.

OR

An industrial wastewater is known to contain only stearic acid (C18H36O2), glycine (C2H5O2N) and glucose (C6H12O6). The results of a laboratory analysis are as follows: Organic Nitrogen = 10 mg/L: Organic Carbon = 125 mg/L and COD = 400 mg/L. Determine the concentration of each of the three constituents in mg/L.

15. With the help of a flow diagram explain the sampling, extraction, analysis and interpretation of results of pesticide residue in soil. Also, list the precautions to be taken in the analysis.

OR

Biodegradation of chlorinated organic compounds such as 1, 1, 1-trichloroethane can be modeled using a second order rate expression. Given the following lab data for experiment measuring the biodegradation of 1, 1, 1-trichloroethane by 100 mg/l of bacteria. Determine whether this biodegradation process is applicable for removal the above compound from soil contaminated @ 10 mg/g soil in 20 years time.

Time, h	Concentration, mg/L				
0	0.50				
2	0.48				
5	0.45				
10	0.41				
24	0.30				
48	0.18				

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.