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Sl. No.

M.Sc. IV Semester Degree Examination, October - 2023

CHEMISTRY

Environmental and Biochemical Analysis

(NEP)

Time : 3 Hours Maximum Marks : 70

Note : *Answer* ***any five*** *of the following questions with Question No.* ***1*** *(****Q 1****. ****Compulsory****), each question carries* ***equal*** *marks.*

1. (a) Describe the sources, health impacts and control techniques for sulfur oxides (SOx) in the atmosphere. How can the ambient concentration of SOx be reduced effectively ? **5**

(b) Discuss the causes and consequences of the ozone hole. How do chlorofluorocarbons (CFCs) contribute to ozone depletion ? **5**

(c) How does noise pollution affect human health and well-being and what measures can be taken to mitigate its impact ? **4**

2. (a) Describe the sources and public health significance of high levels of fluoride in drinking water and what are the recommended standards for safe drinking water in terms of fluoride content ? **5**

(b) Discuss the sources of pesticide contamination in natural water bodies, the potential ecological consequences and strategies for mitigating pesticide pollution. **5**

(c) Discuss the concept of biological oxygen demand (BOD), chemical oxygen demand (COD) and total organic carbon (TOC) in assessing water quality. **4**

3. (a) Explain the significance of soil texture and soil structure in agriculture. How do these physical properties affect soil fertility, water retention and root growth ? **5**

(b) Differentiate between ultimate and proximate analysis of solid fuels like coal. How do these analyses help in understanding the composition and energy content of coal ? **5**

(c) Discuss the various types of soil acidity and the processes of liming to mitigate soil acidity. **4**

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4. (a) Describe the methods used for estimating sodium and phosphate in food samples. **5**

(b) Discuss the various tests and methods employed in the analysis of milk and milk products. **5**

(c) Investigate the analysis methanol in alcoholic drinks. Explain the methods used to detect these compounds and their implications for consumer safety. **4**

5. (a) Discuss the various sources of noise pollution in urban environments and their impact on human health and well-being. **5**

(b) Explore the key environmental laws and regulations aimed at controlling water and air pollution. **5**

(c) Discuss strategies for controlling and safely storing radioactive waste. **4**

6. (a) Explain the formation and characteristics of photochemical smog. What are the primary precursors of photochemical smog and what measures can be taken to reduce its formation in urban areas ? **5**

(b) Explain the concept of the greenhouse effect and its role in global climate change. Provide examples of greenhouse gases and their sources. **5**

(c) Explain the hydrologic cycle and its significance in maintaining the availability of freshwater resources. **4**

7. (a) Explain the significance of analyzing common adulterants in food. **5**

(b) Compare and contrast the roles and effectiveness of environmental laws in addressing water and air pollution. **5**

(c) Explore the techniques used for the estimation of saccharin in food products. **4**

8. (a) How COD and TOC parameters determined and what do they indicate about the pollution level of a water body ? **5**

(b) Explain the concept of cation exchange capacity (CEC) and its importance in soil chemistry. How can CEC be determined experimentally ? **5**

(c) What are the major challenges and limitations in enforcing environmental laws and how can they be overcome to achieve better environmental conservation ? **4**

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