

26/05/2025 FE SEM-II (NEP-2020) CHEM /CSE-AIML /ELECTRICAL /MECHANICAL -  
ECANCES QP CODE: 10085796

Time: 1.5 Hours

Marks: 45

N.B.

1. **Question number 1 is compulsory.**
2. **Attempt any two questions from Q.2 to Q.5.**
3. **Draw neat diagrams and write chemical equations wherever necessary.**
4. **Figures to the right indicate full marks.**  
(Atomic Weights: H = 1, C = 12, N = 14, O = 16, Na = 23, Ca = 40, Mg = 24, Cl = 35.5, S = 32, K = 39)

**Q.1. Solve any five from the following**

**15**

- a) Write three advantages and three disadvantages of Hydro-power Energy.
- b) Write the chemical reactions involved in Catalytic converter.
- c) What are the point sources of water pollution? Explain with two examples.
- d) Write working principle of - 1. Ion Exchange method, 2. Electrodialysis.
- e) Draw schematic diagram of Hydrogen Fuel cell and write reactions involved in it.
- f) Write any three points explaining importance of responsible consumption in sustainable practices.
- g) Calculate temporary and permanent hardness of water sample containing  
Mg (HCO<sub>3</sub>)<sub>2</sub> = 14.6 ppm, Ca (HCO<sub>3</sub>)<sub>2</sub> = 8.1 ppm NaOH = 4 ppm, CaSO<sub>4</sub> = 40.8 ppm

**Q.2.**

- a) What is Natural Resource management? Which are the Principles of Natural Resource Management? Write the Importance of Natural Resource Management. **6**
- b) With Schematic diagram describe the working of Hydroelectric plant. **5**
- c) Calculate total hardness of water sample if 10 ml standard hard water (containing 2.5 g CaCO<sub>3</sub> per 0.5 L of water) requires 10 ml of EDTA and 20 ml hard water sample requires 10 ml of same EDTA. **4**

**Q.3.**

- a) With schematic diagram explain the phenomenon of Thermal stratification of Lake water and its effects. **6**
- b) Explain the advantages and limitations of wind energy. Comment on its impact on the environment. **5**
- c) Define hazardous waste. Write the characteristics by which the hazardous waste can be identified. Write any four sources of hazardous waste. **4**

**Q.4.**

- a) Write a brief note on photochemical smog with respect to its composition, sources, effects and mechanism with chemical reactions. **6**
- b) What are the advantages and disadvantages of Biomass energy. **5**
- c) What is Geothermal energy? Describe the impact of Geothermal energy on environment. **4**

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Q. 5.

- a) Define the term “Waste Hierarchy.” With the neat, labelled diagram of the Waste Hierarchy Pyramid explain each section of Waste Hierarchy. 6
- b) With the help of chemical reactions explain the mechanism of ozone layer depletion. What are the effects of ozone layer depletion? 5
- c) 30 ml of wastewater was diluted to 300 ml with distilled water. The DO was found to be 30 ppm. After incubation at 20°C for 5 days the DO level goes down to 30%. Calculate BOD of water sample. 4