

**G H Raison College of Engineering and Management, Pune**  
(An Autonomous Institution affiliated to Savitribai Phule, Pune University)

Department of First Year B. Tech.

Term - I (2024-25) Set-A

CAE-I

Environmental Chemistry (23UBSL1102)

[Time: 01 Hour]

[Max. Marks-20]

*Instructions to the candidates:*

- 1) All questions compulsory.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.
- 5) BL – Bloom's Taxonomy Level

Q No.	Sub Question		CO	Marks	BL
1	a)	Explain Zeolite process for water softening with principle, labelled diagram & chemical reactions (Softening of Water & Regeneration of Zeolite). Mention two advantages of this process.	CO1	[5]	L2
		<b>OR</b>			
	b)	Discuss the various steps involved in purification of domestic water.	CO1	[5]	L2
	c)	Explain hardness of water. 50 ml of water sample requires 19 ml of 0.01M EDTA in titration. 50 ml of boiled & filtered water sample requires 11.5 ml of the same EDTA. Calculate the Temporary, Permanent and Total hardness of the water sample.	CO1	[05]	L3
		<b>OR</b>			
	d)	Explain the Priming and foaming formation in boiler, causes and preventions.	CO1	[5]	L2
2	a)	Explain solid waste with sources and effects. Mention all steps of solid waste management.	CO2	[5]	L2
		<b>OR</b>			
	b)	Explain the two ill effect of poor management of Biomedical waste. Discuss anyone method of Biomedical Waste Management.	CO2	[5]	L2
	c)	Explain principles of 3R's in reference of E-waste management. List two harmful effects of E-waste.	CO2	[5]	L2
		<b>OR</b>			
	d)	Explain Solid Waste Management of your area with various steps involved in solid waste management.	CO2	[5]	L2

*Handwritten notes and calculations:*

$$\text{Hardness} = \frac{\text{ml of EDTA} \times \text{Normality of EDTA} \times 1000}{\text{Volume of water sample (ml)}}$$

For 50 ml sample: 19 ml EDTA  
 For 50 ml boiled & filtered sample: 11.5 ml EDTA

$$\text{Temporary Hardness} = \frac{19 \times 0.01 \times 1000}{50} = 3.8 \text{ mg/L}$$

$$\text{Permanent Hardness} = \frac{11.5 \times 0.01 \times 1000}{50} = 2.3 \text{ mg/L}$$

$$\text{Total Hardness} = 3.8 + 2.3 = 6.1 \text{ mg/L}$$