[Total No. of Ques. 5] Seat No: 25ML137 [Total No. of Pages: 1]

G H Raisoni College of Engineering and Management, Pune.
(An Empowered Autonomous Institution affiliated to Savitribai Phule, Pune University)

FY B.TECH (All Branches) (SEM I)
ESE WINTER 2025 (2023 Pattern)
Environmental Chemistry (23UBSL1102)

[Time: 2.5 Hours] **[Max. Marks 60]**

Instructions to the candidates:
1) *All questions compulsory.*
2) *Figures to the right indicate full marks.*
3) *Assume suitable data, if necessary.*
4) *CO: Course Outcomes ; BL : Bloom's Taxonomy*

Q. No.	*Sub Question*		*Marks*	*CO*	*BL*
1	*a)*	Explain temporary and permanent hardness. Calculate the total, permanent and temporary hardness when 100 ml of water sample requires 20 ml of 0.02M EDTA during titration. 100 ml of same boiled and filtered water sample requires 15 ml of same EDTA in titration.	[6]	CO1	L3
	b)	Explain the scale formation in boiler. Discuss the causes and prevention methods.	[6]	CO1	L2
		OR			
	c)	Explain Zeolite method for water softening with neat labeled diagram. Give reactions involved.	[6]	CO1	L2
2	*a)*	Describe the sources of biomedical waste with their effect on humans. Discuss the various steps involved in its management.	[6]	CO2	L2
	b)	Describe the sources of E-waste and its impact on humans & environment. Discuss the various steps involved in its management.	[6]	CO2	L2
3	*a)*	Explain the working of H_2-O_2 fuel cell with neat labeled diagram. Give reactions involved at anode and cathode. Mention one advantage of this cell.	[6]	CO3	L2
	b)	Discuss the construction and working of a Lead-acid battery along-with neat diagram and reactions involved in discharge and recharge steps.	[6]	CO3	L2
		OR			
	c)	Discuss the construction and working of a Laclanche cell along-with neat diagram and reactions involved at anode and cathode.	[6]	CO3	L2
4	*a)*	Explain the construction and working of hydroelectric power plant with neat labeled diagram. Mention any two disadvantages.	[6]	CO3	L2
	b)	Explain HCV and LCV with relation between them. Calculate the HCV of solid fuel using following data: Mass of water in calorimeter = 2000g Water Equivalent of calorimeter = 600g Initial temperature = 26.4^{O}C , Final temperature = 27.2^{O}C Weight of solid fuel burnt = 1.0 g	[6]	CO3	L3
5	*a)*	Explain the term water pollution. Discuss any two sources of water pollution and its effect on humans. Mention controlling methods.	[6]	CO4	L2
	b)	Explain the term air pollution. Discuss about effect of any two pollutants. Describe anyone method of controlling air pollution.	[6]	CO4	L2

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