[Total No. of Ques. 05] Seat No: [Total No. of Pages: 01]

G H Raisoni College of Engineering and Management, Pune.
(An Autonomous Institution affiliated to Savitribai Phule ,Pune University)
F. Y. B. (All Branches) (TERM -II)
ESE SUMMER 2024 (2023 Pattern)
ENVIRONMENTAL CHEMISTRY (23UBSL1102)

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

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) ***CO & BL are course outcomes and Bloom's Levels***

Q. No.	*Sub Questions*	*Questions*	*Marks*	*CO*	*BL*
1	*a)*	Explain the term Temporary and Permanent Hardness of water. In an analysis of Lake water following observations was recorded. 50 ml of water sample required 25 ml of 0.01M Na_2EDTA for the end point, whereas 50 ml of boiled and filtered water sample required 20 ml of same Na_2EDTA. Calculate Total, Permanent and Temporary Hardness of water.	[6]	CO1	L3
	b)	Explain the causes and prevention of Boiler corrosion due to dissolved gases and salts with chemical reactions.	[6]	CO1	L2
		OR			
	c)	Explain Zeolite process of water softening with diagram and chemical reactions (water softening and regeneration reaction). Mention two advantages of this process.	[6]	CO1	L2
2	*a)*	Explain two sources of E—waste with its ill effect on human body. Explain steps involved in E- waste management.	[6]	CO2	L2
	b)	Discuss sources of Municipal Solid Waste (MSW).Explain various steps involved in management of MSW.	[6]	CO2	L2
3	*a)*	Explain the construction and working of H_2-O_2 fuel cell along with diagram and reactions. Mention two applications of H_2-O_2 fuel cell.	[6]	CO3	L2
	b)	Describe the construction and working of Lead Acid battery along with diagram and reactions (charging and discharging both). Mention two advantages of this battery.	[6]	CO3	L2
4	*a)*	Explain the construction and working of Bomb Calorimeter with suitable diagram. Mention the formula to calculate GCV of the fuel using this method.	[6]	CO3	L2
		OR			
	b)	In Boy's gas calorimeter, a volatile fuel was burnt, find GCV and NCV of the given fuel with following observations: Quantity of water passing through inner & outer Cu Coil = 30 kg. Volume of gas burnt in the given time at STP = 0.1 m^3 Temperature of Inlet water = 22^0C Temperature of Outlet water = 30^0C Mass of water condensed = 0.04 kg.	[6]	CO3	L3
	c)	Explain the construction and working of Hydroelectric Power Plant with suitable diagram. Mention its two advantages and disadvantages.	[6]	CO3	L2
5	*a)*	Explain two air pollutants with its ill effects on environment. Discuss briefly anyone controlling method of air pollution.	[6]	CO4	L2
	b)	Explain two sources of water pollution with their effects on aquatic animal .Explain controlling methods of water pollution.	[6]	CO4	L2