[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.TECH (All Branches) (TERM -I)
ESE WINTER 2024 (2023 Pattern)
Environmental Chemistry (23UBSL1102)

[Time: 2.5 Hours] **[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 Outcome & Bloom's Level.*

Q. No.	Sub Question		Marks	CO	BL
1	a)	Explain the causes and prevention of Scale formation in Boiler (with chemical reactions).	[6]	CO1	L2
1	b)	Explain Temporary and Permanent hardness of water. If 50 ml of water sample requires 18 ml of 0.05M EDTA during titration. Whereas 50 ml of boiled and filtered water sample requires 12.5 ml of same EDTA in the titration. Calculate Total, Alkaline and non-alkaline hardness of the water sample.	[6]	CO1	L3
		OR			
1	c)	Elaborate phosphate conditioning method of internal treatment of boiler feed water with principle.	[6]	CO1	L2
2	a)	Describe any three sources of generation of E-waste & mention the reason of their bad impact on human health.	[6]	CO2	L2
2	b)	Describe the solid waste on the basis of sources and type. Explain the various stages involved in solid waste management.	[6]	CO2	L2
3	a)	Explain the construction & working of Lead-acid battery along with diagram & charging and discharging reactions involved.	[6]	CO3	L2
3	b)	Describe the construction & working of H_2-O_2 fuel cell along with diagram & reactions involved. Mention two advantages of this battery.	[6]	CO3	L2
4	a)	Describe the working of Bomb calorimeter with neat diagram. Calculate GCV of a coal using following data- Mass of water =2500g, water equivalent of calorimeter =400g, change in temperature is 0.6 ^{0}C and weight of fuel is 0.6g	[6]	CO3	L3
4	b)	Describe the characteristics of an ideal fuel.	[6]	CO3	L2
		OR			
4	c)	Discuss the construction and working of Biogas plant with suitable diagram. Mention two advantages and disadvantages of this method.	[6]	CO3	L2
5	a)	Explain the term water pollution and discuss about its three sources with suitable examples and their effect on environment & life.	[6]	CO4	L2
5	b)	Explain any two air pollutants and its effects on human health. Explain any one controlling method of air pollution.	[6]	CO4	L2

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