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GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR

(GIET UNIVERSITY)

B.Tech. (First Semester) Regular Examinations, December – 2024

23BBSBS10003 – Engineering Chemistry

(Common to all Branches)

Time: 3 hrs

Maximum: 60 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. Show that Sin 2x is not an Eigen Function of operator d/dx but it is an Eigen function of d^2/dx^2. Calculate the Eigen Value.	CO2	K2
b. Define temporary and permanent hardness. Name the soluble salts responsible for the formation of scale.	CO4	K1
c. Define aeration corrosion.	CO1	K1
d. Calculate the EMF of the cell Zn/Zn^{+2} //Ag^{+}/Ag at 298 K given that $E^{o}_{Zn/Zn^{2+}}$= 0.76V and $E^{o}_{Ag^{+}/Ag}$= 0.8V.	CO3	K3
e. Write the synthesis of PTFE & its two uses.	CO2	K2

PART – B **(10 x 5 = 50 Marks)**

Answer ***ALL*** the questions	Marks	CO #	Blooms Level
2. a. Derive time dependent Schrodinger wave equation.	5	CO3	K2
b. Calculate the energy associated with an electron at 3rd energy level of path length 10 nm.	5	CO4	K3
(OR)			
c. Draw the Molecular orbital diagram, magnetic properties and bond order of B_2 molecules.	5	CO2	K2
d. Difference between bonding and antibonding molecular orbital.	5	CO1	K1
3.a. Describe demineralization process.	5	CO3	K3
b. Difference between hot lime and cold lime soda process.	5	CO2	K2
(OR)			
c. Write note on Scale and sludge.	5	CO1	K1
d. A sample of water on analysis has been found to contain following in ppm: $Ca(HCO_3)_2$= 4.86 $Mg(HCO_3)_2$ =5.84 $CaSO_4$= 6.8 $MgSO_4$=8.4 $CaCl_2$=11 $MgCl_2$= 9.5. Calculate the temporary and permanent hardness.	5	CO5	K3
4.a. Define Nernst equation.	5	CO2	K2
b. Calculate the EMF of the cell Zn/Zn^{+2} (0.1 M)//Cu^{+2} (0.01 M)/Cu at 298 K given that $E^{o}_{Zn/Zn^{+2}}$ = 0.76 v and $E^{o}_{Cu^{+2}/Cu}$ = 0.34 v.	5	CO6	K3
(OR)			
c. Describe Galvanic cell.	5	CO2	K2
d. Explain the working, construction, principle and application of Fuel cell.	5	CO4	K3
5.a. Write notes on Pilling bed worth rule.	5	CO1	K1
b. Define corrosion and Explain wet corrosion with examples.	5	CO2	K2

	(OR)			
c.	Differentiate between chemical corrosion and electrochemical corrosion.	5	CO2	K2
d.	Define tinning and Galvanization. Why tinning is better than Galvanization?	5	CO1	K1
6.a.	Explain the synthesis of Bakelite. Mention its physical properties and uses.	5	CO3	K3
b.	Explain addition & condensation polymer with suitable example.	5	CO2	K2
	(OR)			
c.	Write the polymerization, properties and uses of Nylon-6,6, and PMMA.	5	CO4	K3
d.	Classify the polymer on the basis of tacticity or configuration, and molecular force of attraction.	5	CO2	K2

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