QP Code: R252A007 | Reg. No | | | | | | | | | | | AY 23/24

GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR
(GIET UNIVERSITY)

B. Tech (Second Semester – Regular/Supplementary) Examinations, April – 2025

23BBSBS10003 – Engineering Chemistry

(Common to All Branch)

Time: 3 hrs | Maximum: 60 Marks

(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. What do you mean by Eigen value and Eigen function?	CO2	K2
b. Why H_2^+ is more stable than H_2^-?	CO3	K3
c. How phosphate conditioning is better than carbonates conditioning?	CO4	K4
d. Derive Nernst Equation.	CO5	K3
e. Write the synthesis of PTFE & its two uses.	CO2	K1

PART – B **(10 x 5 = 50 Marks)**

Answer ***ALL*** the questions	Marks	CO #	Blooms Level
2. a. Compare O_2, O_2^+, O_2^-,O_2^{2-} in the increasing order of the stability, bond strength & bond length.	5	CO5	K3
b. Difference between bonding and antibonding molecular orbital.	5	CO6	K2
(OR)			
c. Write down the different form of Schrodinger's wave equations.	5	CO4	K3
d. Draw the energy level diagram of O_2 & N_2 and predict their bond order and magnetism.	5	CO3	K3
3.a. 0.28g of $CaCO_3$ is dissolved in 1lit of distilled water to prepare 1lit SHW.35ml of EDTA is consumed for 50ml of SHW. 50ml of hard water sample consumed 25ml of EDTA. 50ml of boiled water consumed 21ml of EDTA. Calculate the temporary and permanent hardness.	5	CO4	K3
b. Explain Phosphate Conditioning.	5	CO3	K2
(OR)			
c. Explain the softening of water by ion exchange process.	5	CO5	K2
d. Calculate the quantity of lime and soda required for softening of 10^6 liter of water containing the following salts per liter $Ca(HCO_3)_2$= 54mg $Mg(HCO_3)_2$ =73mg $CaSO_4$= 13.6mg $MgSO_4$=12mg $CaCl_2$=11.1 $MgCl_2$= 95	5	CO3	K3
4.a. Write note on Ionic product of water.	5	CO6	K2
b. Calculate EMF of the given cell $Zn/Zn^{+2}{}_{(0.1M)}$ // $Cu^{+2}{}_{(0.01M)}/Cu$ at 298 K given that $E^O_{Zn/Zn^{+2}} = 0.76$ V and $E^O_{Cu^{+2}/Cu} = 0.34$ V.	5	CO4	K2
(OR)			
c. Explain Faradays law of electrolysis.	5	CO2	K2
d. Explain Fuel cell and its working, principle and applications also discussed.	5	CO3	K3
5.a. Explain wet corrosion with example.	5	CO4	K2
b. Write notes on concentration cell corrosion, pitting corrosion, Galvanic corrosion.	5	CO4	K2
(OR)			
c. Write short notes on Cathodic Protection .	5	CO5	K2

d.	Define tinning and Galvanization. Why tinning is better than Galvanization?	5	CO4	K2
6.a.	Explain the synthesis of Bakelite. Mention its physical properties and uses.	5	CO6	K2
b.	Explain addition & condensation polymer with suitable example.	5	CO4	K2
	(OR)			
c.	Differentiate between HDPE and LDPE.	5	CO4	K2
d.	Classify the polymer on the basis of tacticity or configuration, and molecular force of attraction.	5	CO5	K2

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