Reg. No.															

Question Paper Code	13751

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

First Semester

Civil Engineering

(Common to All Branches)

20BSCY101 - ENGINEERING CHEMISTRY

Regulations - 2020

Duration: 3 Hours Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Which of the following is a boiler troubles (a) Scale (b) Sludge (c) Priming (d) All of the above	1	K1	CO1
2.	In the adsorption process, the substance that gets adsorbed on the surface is known as: (a) Adsorbate (b) Adsorbent (c) Catalyst (d) Colloid	1	K1	CO1
3.	In an electrolytic cell, where does oxidation occur? (a) Cathode (b) Anode (c) Salt bridge (d) Electrolyte	1	K1	CO2
4.	Which one of the following is appropriate about dry corrosion (a) Presence of moisture (b) Absence of moisture (c) Presence of solvents (d) Absence of acids	1	K1	CO2
5.	Which of the following is considered a non-renewable source of energy? (a) Solar energy (b) Wind energy (c) Coal (d) Biomass	1	K1	CO3
6.	Octane number is used to measure the knocking property of (a) Petrol (b) Diesel (c) Kerosene (d) Water	1	K1	CO3
7.	In the photogalvanic cell the following energy conversion is occurs (a) Chemical to mechanical (b) Chemical to thermal (c) Thermal to electrical (d) Light to electrical	1	K1	CO4
8.	An electrolyte used in alkaline battery is (a) KOH (b) NaCl (c) KCl (d) Polymer electrolyte	1	K1	CO4
9.	What is a significant environmental concern associated with plastic use? (a) High cost (b) Toxicity (c) Non-biodegradability (d) Limited application	1	K1	CO5
10.	What is the size range of nanoparticles typically studied in nanochemistry? (a) 1-100 nm (b) 100-1000 nm (c) 1-1000 µm (d) 1-1000 cm	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	Soft water is not a dematerialized water whereas demineralized water is a soft water. Justify.	2	K2	CO1
12.	Define adsorption and absorption.	2	K1	CO1
13.	Mention any four applications of adsorption.	2	K1	CO1
14.	What are corrosion inhibitors? Give an example.	2	K1	CO2
15.	Write the significance of Nernst equation.	2	K1	CO2
16.	What is the Pilling-Bedworth ratio?	2	K1	CO2
17.	Write the characteristics of a good fuel.	2	K1	CO3
18.	Define calorific value.	2	K1	CO3
19.	What are the drawbacks of wind energy?	2	K1	CO4
20.	Mention the advantages of lithium-ion battery.	2	K1	CO4

21.	Define Degree of polymerization.		*2*	*K1*	*CO5*
22.	What are nanomaterials?		*2*	*K1*	*CO5*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain the demineralization of water by the ion-exchange process. How are exhausted cation and anion exchange resins regenerated?	*11*	*K2*	*CO1*
		OR			
	b)	What are the factors that influence the adsorption of gases on solids? Discuss in detail.	*11*	*K2*	*CO1*
24.	a)	What is the Emf series? Discuss its applications.	*11*	*K2*	*CO2*
		OR			
	b)	What is electroless plating? Describe electroless plating of Nickel and discuss its applications.	*11*	*K2*	*CO2*
25.	a)	Describe the Otto – Hoffman of coke manufacture and the recovery of various by-products.	*11*	*K2*	*CO3*
		OR			
	b)	Explain flue gas analysis by ORSAT method with suitable diagrams.	*11*	*K2*	*CO3*
26.	a)	Explain the Light water nuclear reactor with a neat diagram.	*11*	*K2*	*CO4*
		OR			
	b)	Explain the construction and working principles of Lead-acid battery.	*11*	*K2*	*CO4*
27.	a)	Explain the mechanism of free radical addition polymerization.	*11*	*K2*	*CO5*
		OR			
	b)	Discuss the CVD and electrodeposition techniques for the synthesis of nanoparticles.	*11*	*K2*	*CO5*
28.	a) (i)	Distinguish between Physisorption and Chemisorption.	*6*	*K2*	*CO1*
	(ii)	What is synthetic petrol? How is it manufactured by the Bergius process?	*5*	*K2*	*CO3*
		OR			
	b) (i)	Differences between addition and condensation polymerization.	*6*	*K2*	*CO5*
	(ii)	Write an informative note on solar cells.	*5*	*K2*	*CO4*