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(For those admitted in June 2021 and later)

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
VI	PART-III	CORE	U21CH612	PHYSICAL CHEMISTRY-IV

Maximum: 75 Marks

[illegible]

Course Outcome	Bloom's K-level	Q. No.	SECTION – B (5 X 5 = 25 Marks) Answer <u>ALL</u> Questions choosing either (a) or (b)
CO1	K3	11a.	Define phase, component, and degree of freedom with suitable examples. (OR)
CO1	K3	11b.	Apply the distribution law to solvent extraction.
CO2	K3	12a.	Explain the photovoltaic principle. (OR)
CO2	K3	12b.	Describe the design of a dye-sensitized solar cell (DSSC).
CO3	K4	13a.	Compare the electronic, vibrational, and rotational energy levels of a diatomic molecule. (OR)
CO3	K4	13b.	Explain the selection rules for electronic transitions.
CO4	K4	14a.	Compare Rayleigh and Raman scattering. (OR)
CO4	K4	14b.	Explain the concept of chemical shift and analyze the factors that influence it.
CO5	K5	15a.	Evaluate the importance of symmetry elements in determining molecular properties. (OR)
CO5	K5	15b.	Compare the effectiveness of using symmetry and group theory in understanding chirality.

Course Outcome	Bloom's K-level	Q. No.	SECTION – C (5 X 8 = 40 Marks) Answer <u>ALL</u> Questions choosing either (a) or (b)
CO1	K3	16a.	Describe the phase diagram of the Pb–Ag (lead-silver) eutectic system. (OR)
CO1	K3	16b.	Derive the distribution law thermodynamically.
CO2	K4	17a.	Compare the design and working of DSSCs and traditional silicon solar cells (OR)
CO2	K4	17b.	Compare multi-junction solar cells with traditional silicon-based cells.
CO3	K4	18a.	Explain the Born-Oppenheimer approximation. (OR)
CO3	K4	18b.	What is the effect of isotopic substitution on the rotational spectrum of a diatomic molecule?
CO4	K5	19a.	Evaluate the advantages of high-resolution mass spectrometry (HRMS) over low-resolution techniques in determining molecular formulas. (OR)
CO4	K5	19b.	Compare the effectiveness of NMR and IR spectroscopy in determining molecular structure.
CO5	K5	20a.	Critically assess the differences between Abelian and non-Abelian groups using molecular symmetry examples. (OR)
CO5	K5	20b.	Compare the role of proper (C_n) and improper (S_n) rotational axes in determining the symmetry of molecules.