

**UG DEGREE END SEMESTER EXAMINATIONS - APRIL 2025.**  
(For those admitted in June 2023 and later)



SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
IV	PART-III	CORE-4	U23CH404	GENERAL CHEMISTRY - IV

**Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	<p align="center"><b>SECTION – A (10 X 1 = 10 Marks)</b>  <b>Answer <u>ALL</u> Questions.</b></p>
CO1	K1	1.	Which one of the following is an intensive property? a) mass b) pressure c) density d) temperature
CO1	K2	2.	Identify the path function among the following. a) enthalpy b) entropy c) heat supplied d) free energy
CO2	K1	3.	To get 100% efficiency in a heat engine, the temperature of the sink has to be. a) -273°C b) 0°C c) 100°C d) 1°C
CO2	K2	4.	For pure crystalline substance the entropy at 0K is. a) 100 b) 0 c) 50 d) 1
CO3	K1	5.	The electronic configuration of Cr is. a) [Ar]3d <sup>3</sup> 4s <sup>2</sup> b) [Ar]3d <sup>5</sup> 4s <sup>1</sup> c) [Ar]3d <sup>5</sup> 4s <sup>2</sup> d) [Ar]3d <sup>4</sup> 4s <sup>2</sup>
CO3	K2	6.	The colour of MnO <sub>4</sub> <sup>-</sup> ion is. a) red b) pink c) yellow d) green
CO4	K1	7.	The more volatile compound among following is. a) glycerol b) water c) dimethyl ether d) ethanaol
CO4	K2	8.	The base induced disproportionation reaction is. a) Cannizaro reaction b) Perkin reaction c) Wolf Kishner reaction d) benzoin condensation
CO5	K1	9.	Find the most acidic one. a) CH <sub>3</sub> COOH b) CH <sub>2</sub> FCOOH c) CF <sub>3</sub> COOH d) CHF <sub>2</sub> COOH
CO5	K2	10.	Esters are formed when carboxylic acid reacts with. a) ketones b) ethers c) aldehydes d) alcohols
Course Outcome	Bloom's K-level	Q. No.	<p align="center"><b>SECTION – B (5 X 5 = 25 Marks)</b>  <b>Answer <u>ALL</u> Questions choosing either (a) or (b)</b></p>
CO1	K3	11a.	<p>Discuss the first law of thermodynamics in terms of internal energy.</p> <p align="center"><b>(OR)</b></p> <p>Derive the relationship between C<sub>p</sub> and C<sub>v</sub>.</p>
CO1	K3	11b.	
CO2	K3	12a.	Write note on the physical significance of the state function entropy.

			<b>(OR)</b>
CO2	K3	12b.	Differentiate Gibb's free energy and Helm-holtz free energy.
CO3	K4	13a.	Why do d block elements form coordination complexes?
CO3	K4	13b.	<b>(OR)</b> Compare the chemical properties of representative elements and transition elements.
CO4	K4	14a.	Discuss with equations Perkin reaction and benzoin condensation.
CO4	K4	14b.	<b>(OR)</b> Write a note on reaction of epoxides with alcohols and ammonia.
CO5	K5	15a.	Discuss the reducing properties of formic acid.
CO5	K5	15b.	<b>(OR)</b> Write note on keto-enol tautomerism with example.

Course Outcome	Bloom's K-level	Q. No.	<b>SECTION – C (5 X 8 = 40 Marks)</b> <b>Answer <u>ALL</u> Questions choosing either (a) or (b)</b>
CO1	K3	16a.	Explain the application of zeroth law of thermodynamics in constructing a thermometer.
CO1	K3	16b.	<b>(OR)</b> Explain the application of Hess's law in the determination of enthalpy of formation and enthalpy of transition.
CO2	K4	17a.	Explain the four strokes in Carnot's engine and derive the equation for efficiency of a heat engine.
CO2	K4	17b.	<b>(OR)</b> Enthalpy and Entropy are not sole criteria for spontaneity of a process. Free energy change is the sole criteria for it. Account for.
CO3	K4	18a.	Discuss the periodic trend of atomic size and ionisation potential of transition elements.
CO3	K4	18b.	<b>(OR)</b> Explain the reasons behind the exhibition of variable valencies and magnetic behaviours by transition metals.
CO4	K5	19a.	How do you estimate the quantity of methoxy group present in a given amount of organic compound by Zeisel's method?
CO4	K5	19b.	<b>(OR)</b> Brief the mechanism of Clemmenson reduction and Michael addition.
CO5	K5	20a.	Account for the following
CO5	K5	20b.	i) benzoic acid is more acidic than acetic acid ii) Aromatic carboxylic acids do not undergo Friedel Craft's reaction. <b>(OR)</b> Convert i) benzoic acid to benzaldehyde ii) Ethyl benzene to benzoic acid