GALGOTIAS UNIVERSITY

ADMISSION NUMBER												

School of Basic Sciences

Bachelor of Science Honours in Chemistry
Mid Term Examination - Nov 2023

Duration : 90 Minutes
Max Marks : 50

Sem III - C1UB304B - Chemical Thermodynamics and Equilibrium

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1)	Summarize the term work. Write the mathamatical formulas of work done for irreversible process during expansion and compression.	K2	(2)
2)	Why the value of Cp is always greater than Cv and and write the relation between them.	K1	(3)
3)	Illustrate the concise statement of the first law of thermodynamics. Deduce its mathematical form and explain the terms involved.	K2	(4)
4)	Explain the special forms of First Law of Thermodynamics and derive that $\Delta H = q_p$.	K2	(6)
5)	Utilize the law of thermodynamics to discuss different types of thermodynamic processes.	K3	(6)
6)	Apply the concept of thermodynamics derive an expression for the work done by a gas in isothermal reversibly expansion of an ideal gas. One mole of an ideal gas at 25°C is allowed to expand reversibly at constant temperature from volume 10 litres to 20 litres. Calculate the work done by the gas in Joules and calories.	K3	(9)
7)	Compare various factors on which bond energy depends and define the term bond energy. Given that energies for H–H, O=O and O–H bonds are 104, 118 and 111 kcal mol–1 respectively, calculate the heat of the reaction $H_2(g) + 1/2O_2(g) \rightarrow H_2O(g)$	K4	(8)
8)	(i) Analyze and calculate the work done when 2 moles of an ideal gas expands reversibly and isothermally from a volume of 500 ml to a volume of 2 L at 25°C and normal pressure. (ii) Calculate the standard heat of formation of propane, if its heat of combustion is −2220.2 kJmol−1 the heats of formation of CO_2 (g) and H_2O(1) are −393.5 and −285.8 kJ mol−1 respectively.	K4	(12)
	OR		
	Analyse and write the different possibilities of Maxwell relation used in thermodynamics	K4	(12)