

Name. _____		Printed Pages:01		
Student Admn. No.: _____				
School of Basic Sciences Summer Term Examination – July - August 2024 [Programme: B.Sc. (H) Chemistry][Semester: 2nd] [Batch:1]				
Course Title: Chemical Thermodynamics And Equilibrium Course Code: C1UB204B		Max Marks: 100 Time: 3 Hrs.		
Instructions:	1. All questions are compulsory. 2. Assume missing data suitably, if any.			
		K Level	COs	Marks
SECTION-A (15 Marks)		5 Marks each		
1.	Define the term state and path function and discuss zeroth law of thermodynamics.	KL1	CO1	5
2.	Determine ΔH of the reaction $C(s) + 2H_2(g) \rightarrow CH_4(g)$ from the following data: (i) $C(s) + O_2(g) \rightarrow CO_2(g)$, $\Delta H = -393.7 \text{ kJ}$ (ii) $H_2(g) + 1/2 O_2(g) \rightarrow H_2O(l)$, $\Delta H = -285.7 \text{ kJ}$ (iii) $CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(l)$, $\Delta H = -890.3 \text{ kJ}$	KL2	CO3	5
3.	Explain which is strong and weak electrolytes from the following salts: NaCl, $C_2H_2O_4$, KCl, HCOOH, NaOH, CH_3COOH , KOH, NH_4OH .	KL2	CO5	5
SECTION-B (40 Marks)		10 Marks each		
4.	Justify this statement with suitable examples if any event in the nature is spontaneous, so the total entropy change is in positive side.	KL2	CO3	10
5.	Explain the concept of thermodynamic scale of temperature in second law of thermodynamics with suitable diagram.	K3	CO2	10
6.	Derive the Henderson equation.	K4	CO5	10
7.	Describe Le-Chatellier Principle. Discuss the effect of temperature, volume and pressure with suitable examples.	K3	CO2	10
SECTION-C (45 Marks)		15 Marks each		
8.	Explain the four processes of carnot cycle and derive the net work done by the cycle.	K4	CO3	15
9.	Illustrate that at equilibrium criteria of thermodynamics equation for $(\delta S)_{U,V=0}$	K5	CO4	15
10	Elaborate De Donder's treatment of chemical reaction.	K5	CO4	15