
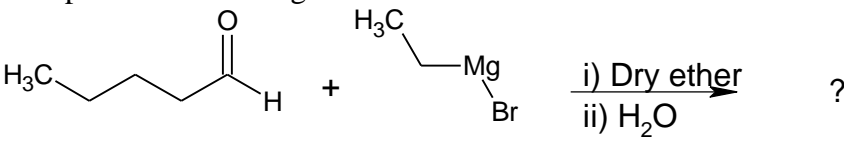
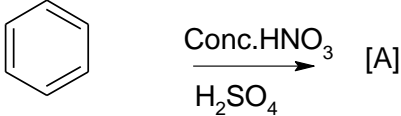
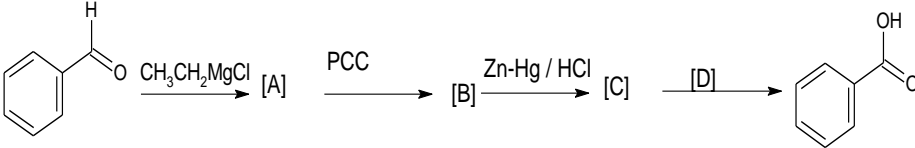
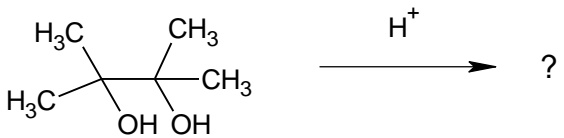
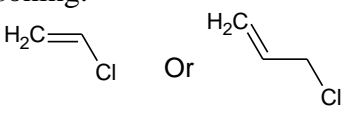
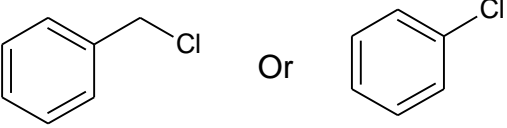
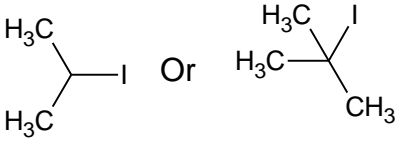
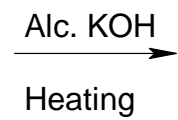
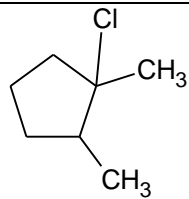
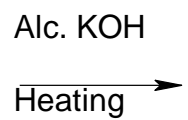
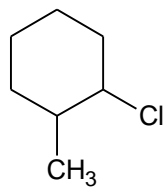


Name:			
Enrolment No:			
UPES End Semester Examination, May 2023			
Course: Chemical energetics, equilibria, and functional group organic chemistry Program: B.Sc (H)-Geology / Physics/ Mathematics (Generic elective) Course Code: CHEM1008G		Semester: II Time : 03 hrs. Max. Marks: 100	
Instructions: Attempt all questions.			
SECTION A (5Qx4M=20Marks)			
S. No.		Marks	CO
Q 1	Complete the following reaction 	4	CO1
Q 2	Explain integral and differential enthalpy of solution.	4	CO1
Q 3	Compare SN1 and SN2 reactions with suitable examples	4	CO3
Q 4	Derive relationship between Kp and Kc.	4	CO1
Q 5	2A(g) + B(g) ↔ D(g) + E(g) + 100 Kcal . Discuss the effect of temperature and Concentration at equilibrium of given reaction.	4	CO1
SECTION B (4Qx10M= 40 Marks)			
Q 6	a) Calculate pH of the following solutions. i) 0.002 M HNO ₃ ii) 0.004 N KOH b) What are buffer solution? Write the equation used to calculate pH of a buffer solution.	5+5	CO1
Q 7	(i) Derive an expression for relation between total pressure P and degree of dissociation α for reaction 2NH ₃ (g) ↔ 3H ₂ (g) + N ₂ (g). (ii) Complete the reaction with mechanism: 	5+5	CO1 CO3

Q 8	<p>(i) Complete the following reaction sequence:</p>  <p>Write full form of PCC. (ii) What is common ion effect (iii) What is third law of thermodynamics</p>	6+2+2	CO3 CO2 CO1
Q 9	<p>Explain the following with suitable reactions</p> <p>a) Reimer Tiemann reaction b) Houben Hoesch condensation</p>	10	CO2
SECTION-C (2Qx20M=40 Marks)			
Q 10	<p>(i) The molar heat of formation of $\text{NH}_4\text{NO}_3(\text{s})$ is -367.54 kJ and those of $\text{N}_2\text{O}(\text{g})$ and $\text{H}_2\text{O}(\text{l})$ are $+81.46 \text{ kJ}$ and -285.78 kJ respectively at 25°C and at 1 atm pressure. Calculate ΔH for the reaction $\text{NH}_4\text{NO}_3(\text{s}) \rightarrow \text{N}_2\text{O}(\text{g}) + 2\text{H}_2\text{O}(\text{l})$.</p> <p>(ii) Complete and explain the following reaction</p>  <p>(iii) Which will be more reactive for $\text{S}_{\text{N}}1$ reaction Give suitable reasoning.</p> <p>a) </p> <p>b) </p> <p>c) </p>	8+8+6	CO1 CO2 CO3
Q 11	<p>(i) Discuss benzyne mechanism with relevant example. (ii) How will you differentiate between primary, secondary and tertiary alcohol. Write name of test, principle and reactions. (iii) Complete the following reaction</p>	8+8+6	CO3 CO2 CO3



Major + Minor



Major + Minor