
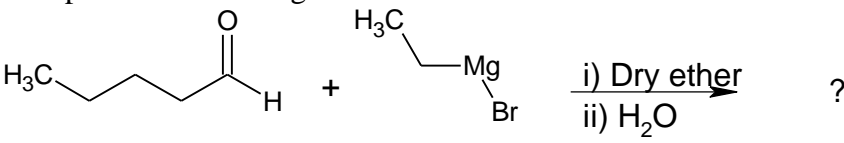
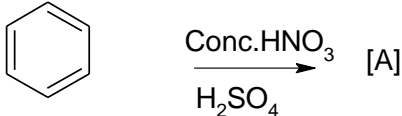
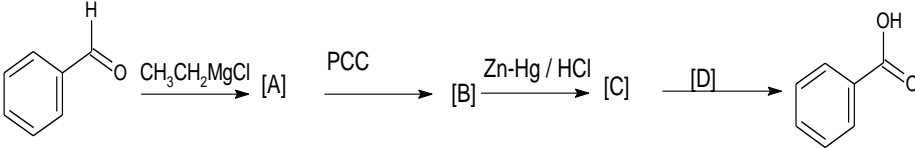
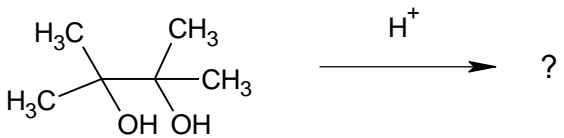
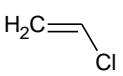
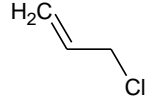
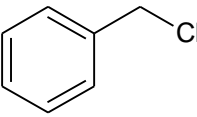
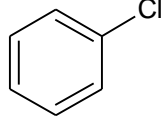
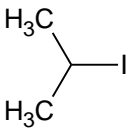
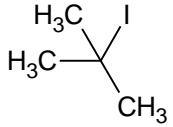
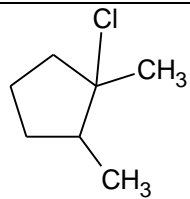


Name:			
Enrolment No:			
<b>UPES</b> <b>End Semester Examination, May 2023</b>			
<b>Course:</b> Chemical energetics, equilibria, and functional group organic chemistry <b>Program:</b> B.Sc (H)-Geology / Physics/ Mathematics (Generic elective) <b>Course Code:</b> CHEM1008G		<b>Semester:</b> II <b>Time</b> : 03 hrs. <b>Max. Marks:</b> 100	
<b>Instructions: Attempt all questions.</b>			
<b>SECTION A</b> <b>(5Qx4M=20Marks)</b>			
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
<b>SECTION B</b> <b>(4Qx10M= 40 Marks)</b>			
Q 6	a) Calculate pH of the following solutions. i) 0.002 M HNO <sub>3</sub> 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 <sub>3</sub> (g) ↔ 3H <sub>2</sub> (g) + N <sub>2</sub> (g). (ii) Complete the reaction with mechanism: 	5+5	CO1 CO3

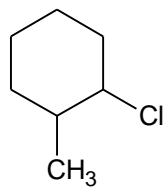
Q 8	<p>(i) Complete the following reaction sequence:</p>  <p>Write full form of PCC.  (ii) What is common ion effect  (iii) What is third law of thermodynamics</p>	6+2+2	CO3 CO2 CO1
Q 9	<p>Explain the following with suitable reactions</p> <p>a) Reimer Tiemann reaction  b) Houben Hoesch condensation</p>	10	CO2
<b>SECTION-C</b> <b>(2Qx20M=40 Marks)</b>			
Q 10	<p>(i) The molar heat of formation of <math>\text{NH}_4\text{NO}_3(\text{s})</math> is <math>-367.54 \text{ kJ}</math> and those of <math>\text{N}_2\text{O}(\text{g})</math> and <math>\text{H}_2\text{O}(\text{l})</math> are <math>+81.46 \text{ kJ}</math> and <math>-285.78 \text{ kJ}</math> respectively at <math>25^\circ\text{C}</math> and at <math>1 \text{ atm}</math> pressure. Calculate <math>\Delta\text{H}</math> for the reaction <math>\text{NH}_4\text{NO}_3(\text{s}) \rightarrow \text{N}_2\text{O}(\text{g}) + 2\text{H}_2\text{O}(\text{l})</math>.</p> <p>(ii) Complete and explain the following reaction</p>  <p>(iii) Which will be more reactive for <math>\text{S}_{\text{N}}1</math> reaction Give suitable reasoning.</p> <p>a)  Or </p> <p>b)  Or </p> <p>c)  Or </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



Alc. KOH

Major + Minor

Heating



Alc. KOH

Major + Minor

Heating