(Pages : 6) **U – 6602**

Reg. No. : .....

Name : .....

First Semester M.Sc. Degree Examination, February 2025

Chemistry/Analytical Chemistry/Polymer Chemistry/Chemistry with Specialisation In drug Design and Development

CH 212/CL 212/PC 212/CHDD 512 — ORGANIC CHEMISTRY — I

(2020 Admissions Onwards)

Time : 3 Hours Max. Marks : 75

PART – A

Answer **two** among (a), (b) and (c) from each. Each sub question carries **2** marks :

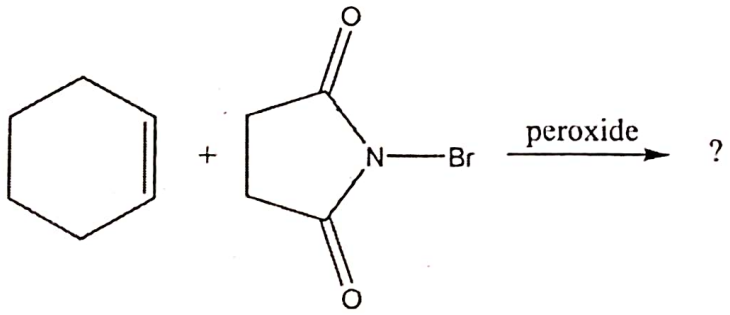
1. (a) Draw the structure with R and S configuration (each one) of enantiomers of 3-chloro-2,2,5 -trimethylhexane.

   (b) Give the structure and use of L-DOPA.

   (c) Draw the structure of S(-)- 6,6'-dinitro-2,2'-diphenic acid.

2. (a) Write the equation for hydroxyl radicals formation from Fenton's reaction.

   (b) Find the product of the following reaction.



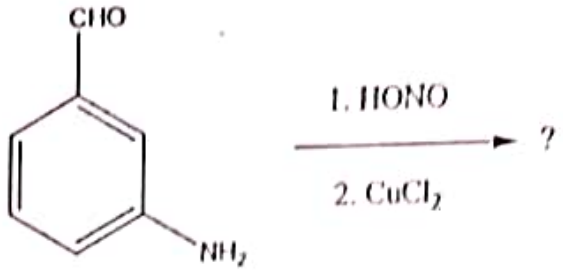
   (c) What is mean by capto-dative stabilization in free radicals?

P.T.O.

3. (a) How to affect the polarity of solvent on the substitution reactions?

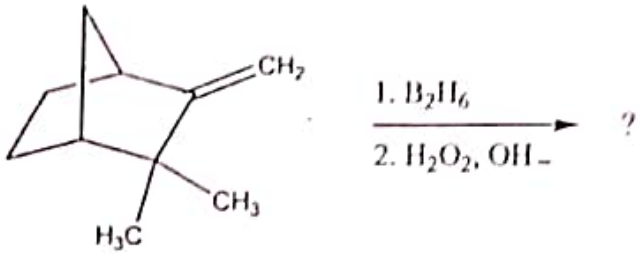
(b) Write the mechanism of benzyne intermediate formation.

(c) Predict the product of following reaction.



4. (a) Bromination of aliphatic alkenes usually gives *anti*- addition but *syn* addition is often dominant for alkenewith phenyl substituent. Why?

(b) Give the product of given reaction.



(c) Write the Reformatsky reaction with an example.

5. (a) Write the E1 cB mechanism for an elimination reaction

(b) Predict the product with conformational aspects of the following reaction.

(c) What is Lindlar's catalyst? Give its uses.

(10 × 2 = 20 Marks)

PART – B

Answer either **(a) or (b)** from each question. Each sub question carries **5** marks :

6. (a) Draw the structure with stereochemistry of following spiranes.

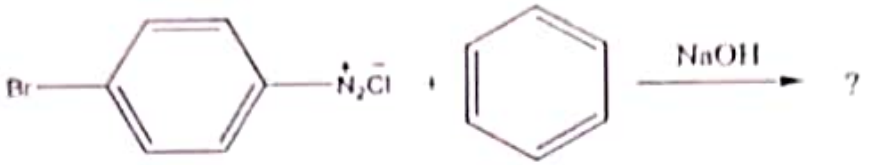
   (i) (S)-Spiro [3.3] heptane-2, 6-dicarboxylic acid

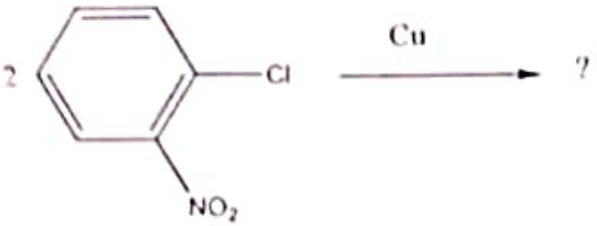
   (ii) (1S, 1-6)-Spiro [3.3] heptane-1, 6-dicarboxylic acid

   (b) What are pro-R and pro-S? Explain with example.

7. (a) Discuss the structure and stability of free radical intermediates.

   (b) Give the products of the following reactions.

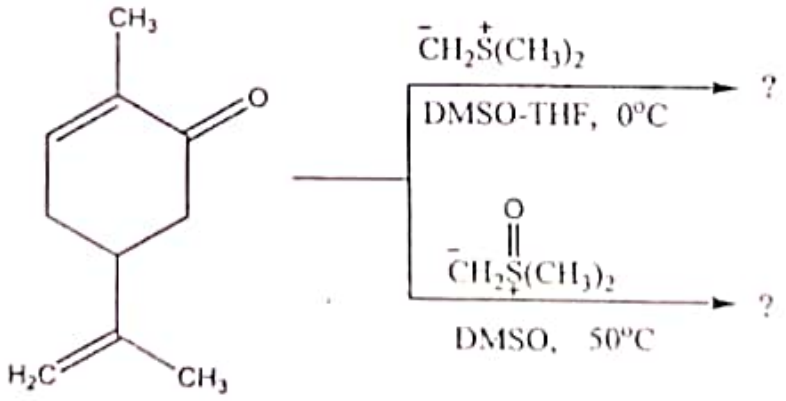
(i) 

(ii) 

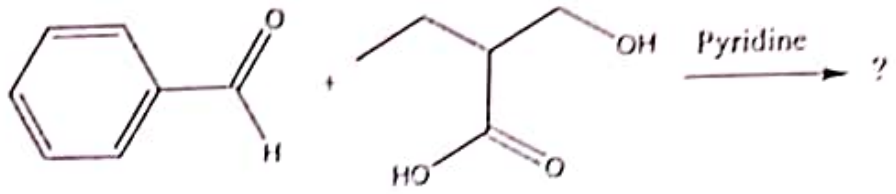
8. (a) Discuss the evidence for the arenium ion mechanism in aromatic electrophilic substitution reactions.

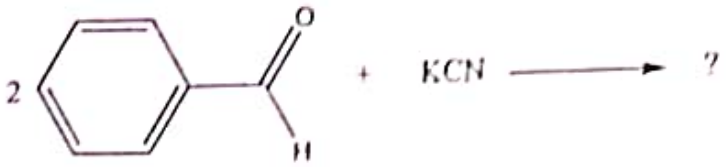
   (b) Explain the acid and base hydrolysis of an ester.

9. (a) Give the product and mechanism of the following reaction.



(b) Identify the reaction and find the product of the following reactions.

(i) 

(ii) 

10. (a) Discuss about the Saytzeff and Hoffmann rules in elimination reactions.

(b) Explain the Shapiro and Wittig-Horner reactions with mechanism.

(5 × 5 = 25 Marks)

PART – C

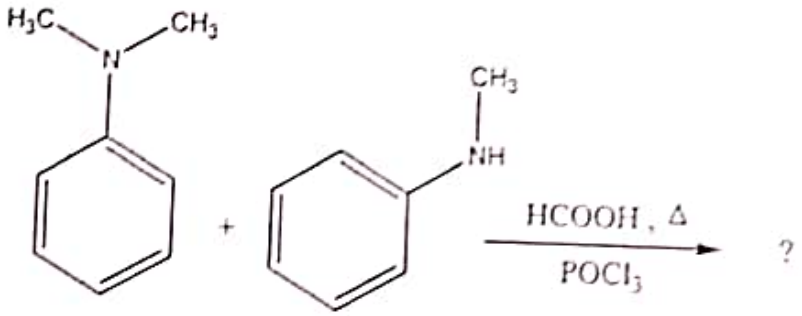
Answer **any three** questions. Each questions carries **10** marks.

11. Give the effect of electronegative atom and Lewis catalyst on addition of nucleophile to carbonyl carbon. Explain with Felkin-Ann model.

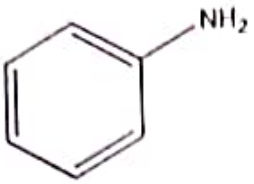
12. (a) Write the mechanism for addition of singlet and triplet carbenes to alkenes reaction.

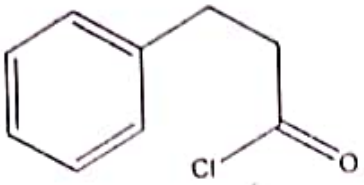
(b) Discuss the preparation of nitrenes and addition reaction of nitrenes with alkenes.

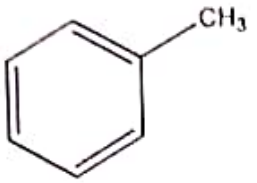
13. Complete the following reactions

(a) 

(b)  + HN_3 $\xrightarrow{AlCl_3}$?

(c)  $\xrightarrow[2.\ 180\text{-}190^{\circ}C]{1.\ H_2SO_4}$?

(d)  $\xrightarrow{AlCl_3}$?

(e)  $\xrightarrow{Cl_2,\ Fe,\ or\ FeCl_3}$ A + B

14. (a) Give one example for the following reactions

(i) Darzens reactions

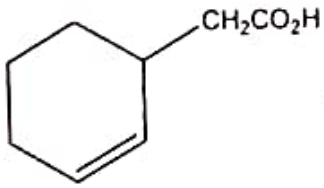
(ii) Dieckmann condensation

(iii) Mannich reaction

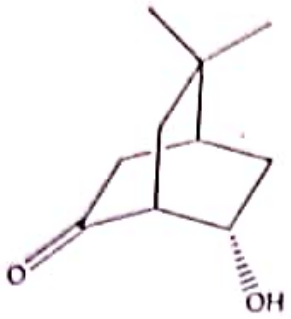
(iv) Storkenamine reaction

(v) Aldol condensation.

15. Complete the following reactions with mechanism.

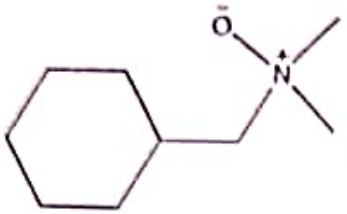
(a)  $\xrightarrow[CH_2Cl_2]{PhSeCl,\ Et_3N}$ A $\xrightarrow[THF]{H_2O_2}$ B

(b)



1. NaH, CS_2
2. CH_3I → C → (Δ) → D

(c)



→ E

(3 × 10 = 30 Marks)