22CHP205

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2023
(Second Semester)

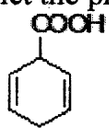
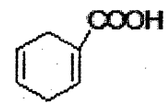
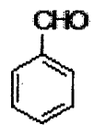
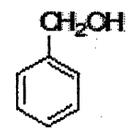
Branch – **CHEMISTRY**

ORGANIC REACTION MECHANISM AND RETROSYNTHESIS

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1. Which of the mechanism does go Via. Benzyne intermediate?
   (i) Deprotonation (ii) Addition- Elimination
   (iii) Elimination-Addition (iv) None of these

2. Predict the product when benzoic acid is treated with $Na/NH_3/EtOH$, H_3O^+?
   (i) 
   (ii) 
   (iii) 
   (iv) 

3. A free radical is
   (i) Neutral in characters (ii) Shortly lived
   (iii) Paramagnetic (iv) All of these

4. Which of the following reagents is Umpolung reagent?
   (i) 1,2-Dithiane (ii) 1,3-Dithiane
   (iii) LDA (iv) DCC

5. The two reactions involved in the Robinson annulations are
   (i) Hydroboration and oxidation
   (ii) Perkin reaction and Michael reaction
   (iii) Michael reaction and Aldol condensation
   (iv) None of these

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6. a) Discuss the ambident substrates and ambident nucleophile.
   OR
   b) Write a note on Chichibabin reaction.

7. a) Define: i) Hofmann rule ii) Saytzeff's rule.
   OR
   b) Explain the uses of SeO_2 and chromic acid in organic synthesis.

8. a) State and explain the Markownikov rule and anti- Markownikov rule.
   OR
   b) Explain the mechanism of Wittig reaction.

Cont...

9. a) What are Gilman reagents? Give its two synthetic applications.

OR

b) Give a brief account on Peterson synthesis.

10. a) Illustrate the regioselectivity and chemoselectivity.

OR

b) Give a brief account on polarity reversal.

SECTION -C (30 Marks)

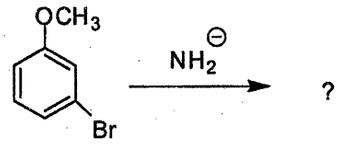
Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11. a) Discuss the various factors that govern the extent of SN_1 and SN_2 mechanism.

OR

b) Propose the mechanism of the given reaction. Identity the intermediate. Briefly explain the orbital picture of the intermediate.



12. a) Outline the mechanism of $E_{1C}B$.

OR

b) Explain the mechanism of i) Chugave reaction ii) Birch reduction.

13. a) Discuss the mechanism of Mannich reaction and Benzoin condensation.

OR

b) Suggest a suitable mechanism of i) Epoxidation ii) Michael addition.

14. a) Illustrate the synthetic uses of PTC and $LiAlH_4$ in organic synthesis.

OR

b) Give any two synthetic uses of the following compounds in organic synthesis.
i) DDQ ii) LDA iii) $NaBH_3CN$.

15. a) Write a brief account on i) Retrosynthesis ii) Robinson annelation.

OR

b) Describe the interconversions of $-NH_2$, -COOR and –CONHR groups in organic reactions.

Z-Z-Z END