



Date: 03-12-2022

Dept. No.

Max. : 100 Marks

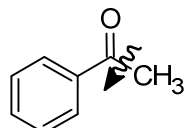
Time: 01:00 PM - 04:00 PM

**Part-A**

Answer ALL questions.

(10 × 2 = 20)

1. Suggest a synthon and synthetic equivalent for the following.



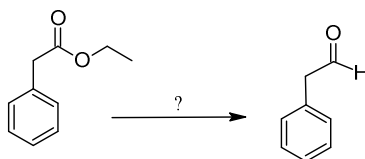
- Provide any two examples of activating groups.
- What is Wolf-Kishner reduction?
- Mention the application of peracids in oxidation reactions.
- What is oxy-cope rearrangement reaction?
- Provide the names of different types of pericyclic reactions.
- Write the order of aromaticity of pyrrole, furan and thiophene.
- Write any one method of preparation for furan and thiophene.
- Give the structure of the following compounds and give numbering.  
(i) Isoindole (ii) Sulfolane
- How is THF prepared?

**Part-B**

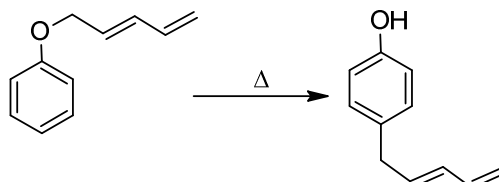
Answer any EIGHT questions.

(8 × 5 = 40)

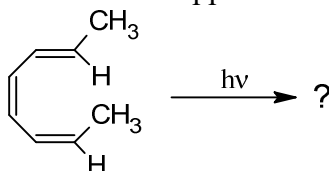
- Convergent synthesis is better than linear synthesis. Justify.
- Analyze the synthetic utility of Seebach's umpolung approach in organic synthesis.
- Write a note on protecting and activating groups in organic synthesis.
- Compare the mechanism of Cr(VI) and Mn(VII) based oxidation reactions.
- Identify the reagents and conditions required for the given conversion and justify with the suitable mechanism.



16. Account for the following conversion.



17. Predict the type of electrocyclization that (E, Z, Z) 1,3,5-hexatriene undergoes under photochemical conditions based on the Frontier Molecular orbital approach.



18. "Five membered heterocyclic compounds undergo electrophilic substitution reaction at

C-2 whereas pyridine undergoes at C-3 position ". Explain.

19. Explain the mechanism of the following reactions:

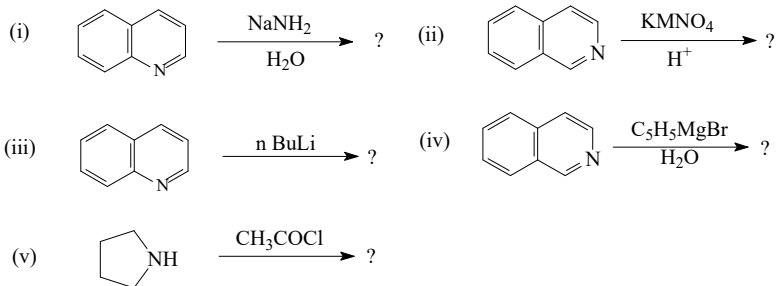
(i) Nitration of pyrrole

(ii) Friedel-Crafts acylation of furan

20. Write any five electrophilic substitution reactions of pyridine.

21. Explain the mechanism of Skraup synthesis of quinoline.

22. Predict the product of the following reactions.

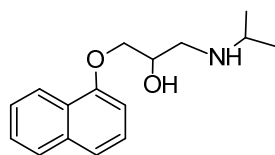


### Part-C

Answer any **FOUR** questions.

(4 × 10 = 40)

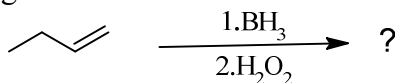
23a. Design a viable synthetic scheme for propranolol, a beta blocker based on retrosynthetic approach. (6)



Propranolol

b. Write a note on the control elements in organic synthesis. (4)

24a. Predict the product in the following conversion with the mechanism. (5)

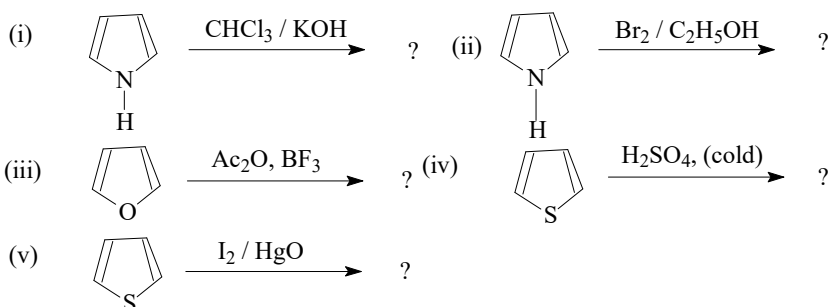
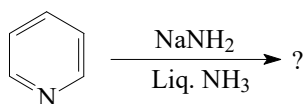


b. Examine the mechanism of LAH reduction of carbonyl compounds. (5)

25a. Outline the significance of Birch reduction in organic synthesis.

b. Explain the mechanism of Hantzsch synthesis of pyridine. (5+5)

26a. Complete the following reaction with mechanism.



b. Predict the products.

27a. Explain the mechanism of Bischler-Napieralski synthesis. (5+5)

b. Write any five electrophilic substitution reactions of quinoline.

28. Discuss the synthetic applications of THF and 1,4-dioxane. (5+5)

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