

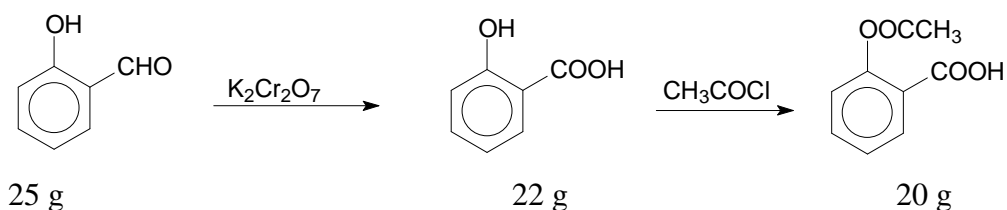
**PART-A**

Answer **ALL** questions.

(10 × 2 = 20)

01. Write the mechanism of hydroboration with an example.

02. Calculate the percentage yield of aspirin formed?



03. Define umpolung concept. What are its advantages?

04. Write the equation involving oxidation of alcohol using chromic oxide.

05. How is catalytic hydrogenation different from dissolving metal reduction? Give reasons.

06. Write is the thermal cycloaddition reaction between allylic anion and acrolein?

07. Give an example for (1,3) and (1,5) sigmatropic rearrangement reactions? What is the stereochemistry of their final products?

08. Why group transfer reactions are neither cycloaddition nor sigmatropic rearrangement reactions?

09. State the laws of photochemical equivalence.

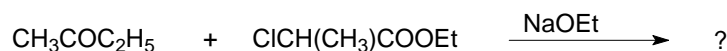
10. What are hot ground state reactions?

**PART-B**

Answer any **EIGHT** questions.

(8 × 5 = 40)

11. Predict the product and explain the mechanism of following reaction.(5)



12. Explain the C-C disconnections in 1,3- and 1,4-difunctionalised compounds with examples.

13. What are protecting groups? How is a carbonyl protected and deprotected?

14. Using carbonyl compounds how various derivatives are prepared?

15. a) How catalytic hydrogenation can control stereochemistry in alkynes? (3)

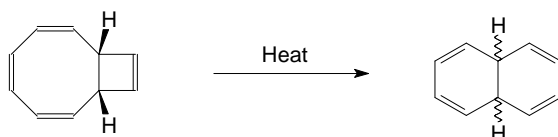
b) Predict the products in the following reaction. (2)



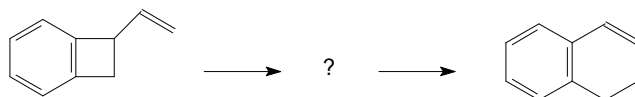
16. Explain the effect of substituents in Birch reduction.

17. Explain the reduction of ester and amide using  $LiAlH_4$ ? (2½ + 2½)

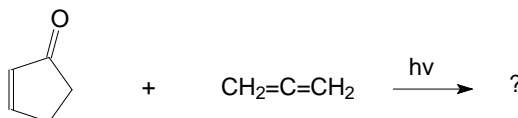
18. Predict the stereochemistry of the product and write the mechanism of the reaction.



19 Effect the following conversions. Identify the missing product.



20. Predict the products in the following reaction and explain the mechanism..



21. Write a short note on various photochemical processes taking place in the excited state.

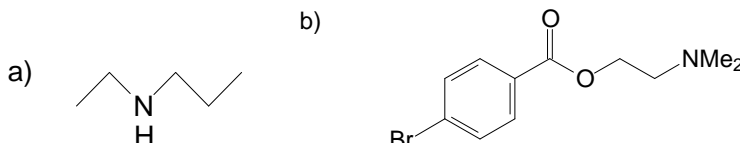
22. Explain the mechanism of Paterno Buchii reaction in alkynes.

### PART-C

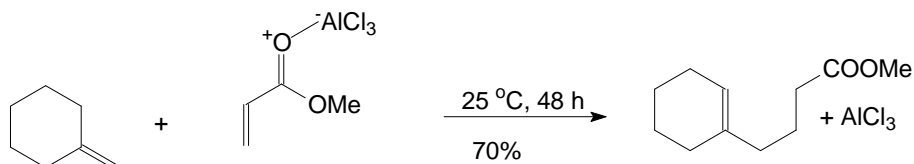
Answer any **FOUR** questions.

(4 × 10 = 40)

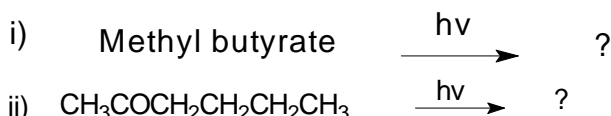
23. a) How hydroxyl groups are added on to carbon-carbon multiple bonds? (3)  
 b) Explain the mechanism of Wittig Horner reaction? What are the advantages of this method? How is the formation of intermediate confirmed? (3)  
 c) Write short note on stereoselective reactions with examples. (4)
24. Perform retrosynthesis and subsequently synthesize the given compounds. (5 + 5)



25. a) Explain the importance of functional group interchange in organic synthesis. Give one example. (5)  
 b) How are active methylene compounds useful in organic synthesis? Explain the mechanism of Knoevenagel reaction. (5)
26. a) How is cubane synthesized? (5)  
 b) Explain the  $\text{KMnO}_4$  oxidation in neutral condition? Give an example. (2)  
 c) Explain regioselectivity in cycloaddition reactions with examples. (3)
- 27 Write the mechanism of following reaction (4).



- b) Write the correlation diagram for the cycloaddition reaction of 1,3-butadiene and ethylene. State whether the reaction is thermally or photochemically feasible. (6)
28. a) What is di- $\pi$ -methane rearrangement? Explain with an example. (4)  
 b) Predict the products in the following photochemical reactions with mechanism. (3+3)



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