



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION - CHEMISTRY

THIRD SEMESTER – NOVEMBER 2011

CH 3808 - PHOTOCHEMISTRY AND ORGANIC SYNTHESIS

Date : 31-10-2011
Time : 9:00 - 12:00

Dept. No.

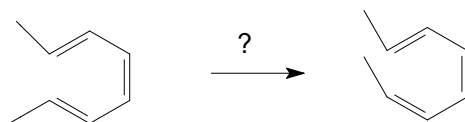
Max. : 100 Marks

Part-A

Answer **ALL** questions.

(10 × 2 = 20)

01. What is 1,4-Michael addition reaction? Write its mechanism.
02. If 25g of phenol forms paracetamol after 4 step synthesis with step-1 yielding 65%, step-2 yielding 75%, step-3 yielding 90% and step-4 yielding 80%, calculate the amount of paracetamol formed.
03. What are the synthons obtained from the following synthetic equivalents?
i) $\text{CH}_3\text{CH}=\text{CH}_2$ ii) pyridine
04. Write the mechanism of electro-oxidation of hydroquinone.
05. Compare dissolved metal reduction and catalytic hydrogenation reactions.
06. How is the following conversion done?



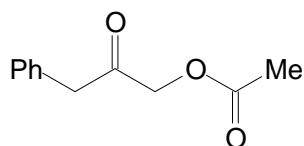
07. What are cheletropic reactions? Give examples.
08. How to choose 1,3-dipolar compounds suitable for cycloaddition reactions?
09. Discuss a photochemical dimerisation reaction? Write its mechanism.
10. Explain various types of photophysical processes?

Part-B

Answer any **EIGHT** questions.

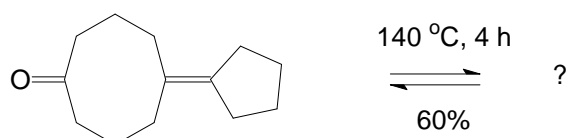
(8 × 5 = 40)

11. Explain the mechanism of following reactions. (3+2)
a) Simmon Smith reaction b) hydroboration reaction
12. Predict the retrosynthesis of the following compound. (5)

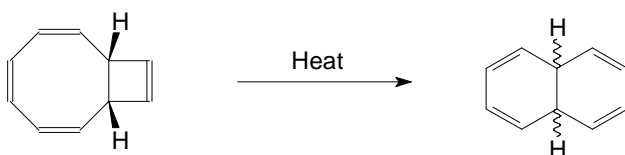


13. How are 1,2- and 1,3-difunctionalised compounds synthesized? Give examples.
14. How protecting groups are useful to convert regioselective reactions into regiospecific reactions? Give any two examples.
15. How is cubane synthesized?.

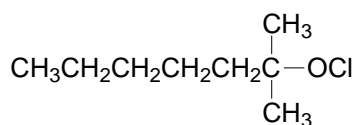
16. Explain the mechanism of following reactions.
- Knoevenagel reaction
 - Perkin's reaction
17. Draw correlation diagram for the cycloaddition reaction of two molecules of ethylene. Predict whether the reaction is thermally or photochemically allowed.
18. If hydrazobenzene in acid medium undergoes (3,3)- and (3,5)-sigmatropic rearrangements, what are the products formed? Explain the mechanism of the reaction.
19. a) The following compound undergoes 6 electron group transfer reaction. Predict the product and write the mechanism of the reaction.



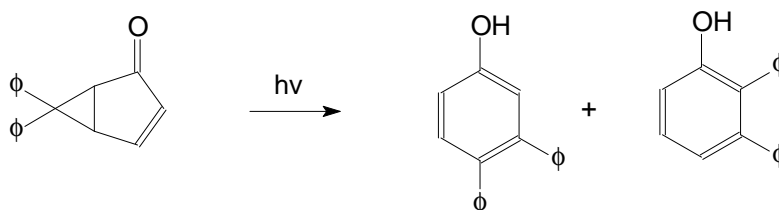
- b) Predict the stereochemistry of the mentioned H atoms in the product and write the mechanism of the reaction.



20. Derive the kinetic parameters for photochemical reactions.
21. What is Barton reaction? Predict the product in the following compound.



22. How are the following products formed from the reaction?



Part-C

Answer any **FOUR** questions.

(4 × 10 = 40)

23. Write a short note on the following.

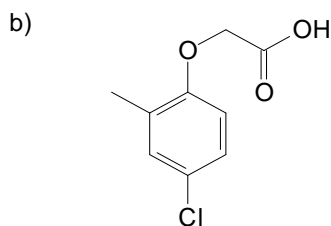
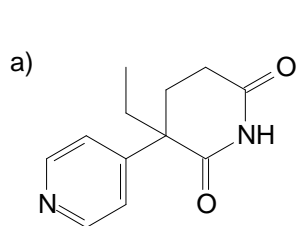
(4 + 3 + 3)

- Stobbe reaction
- Wittig reaction
- Darzen's reaction

24. a) How is protection and deprotection of hydroxyl and amine groups done? (6)

- How LiAlH_4 reduction takes place in amides?

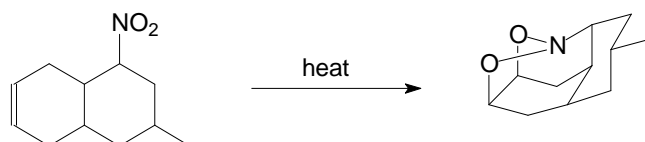
25. How are the following compounds synthesized by retrosynthetic approach? (5+5)



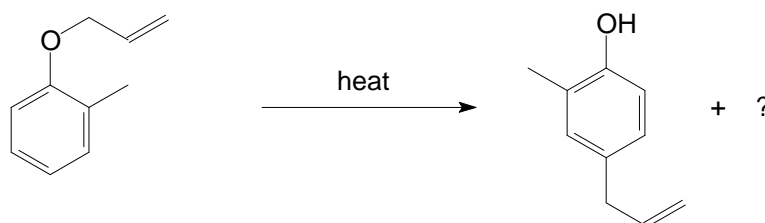
26. a) Discuss on any four C-C disconnection approaches with examples. (6)

b) What are the advantages of functional group interchange in organic synthesis? Explain with an example? (4)

27. a) Predict a suitable mechanism for the following reaction. (4)



b) There are two rearrangements involved in the following reaction. Identify them and write the mechanism. What is the other product formed in this reaction? (3+3)



28. a) Explain the structure of excited state molecules? (4)

b) Why Paterno Buchi reaction takes place only under certain conditions? How α,β -unsaturated carbonyl compounds can be prepared from Paterno Buchi reaction? (6)

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