



III Semester M.Sc Degree Examination, December 2014
(2010 –11 Scheme) (NS)
CHEMISTRY
C–301-OC : Organic Reaction Mechanisms

Time : 3 Hours

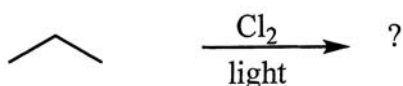
Max. Marks : 80

Instruction : Answer question 1 and any five of the remaining.

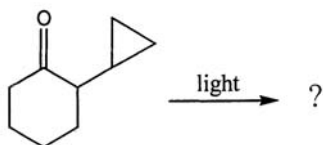
Answer any ten of the following :

(10×2=20)

1. a) Give one example each for SE1 and SE2 mechanism.
- b) Vinyl halides are unreactive towards both S_N^1 and S_N^2 reactions. Why ?
- c) Predict the major product for the following reactions. Justify your answer.



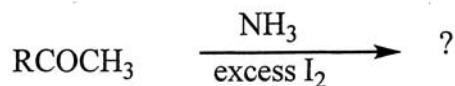
- d) Give different methods for the generation of free radicals.
- e) Explain why benzophenone is used as photosensitizer to get triplet 1,3-butadiene state instead of direct photolysis.
- f) Name and write the different isomers of benzene molecule under photochemical condition.
- g) During electrocyclic reaction, which orbital symmetry is involved in conrotatory motion ? Explain with illustration.
- h) Predict the product for the following :



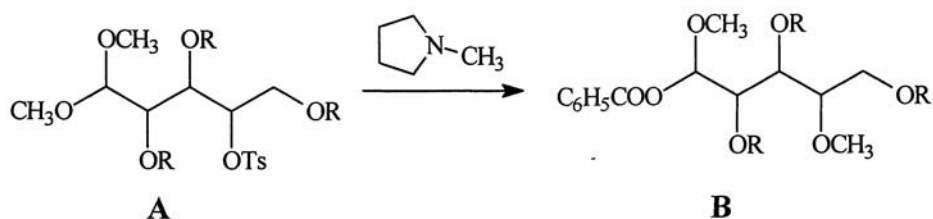
- i) With suitable example, explain the terms supra and antarafacial interactions.
- j) Mention different sources for the generation of acetyl coenzymes in our body.
- k) Write the structures of Coenzyme A and thiamine pyridoxyl pyrophosphate.
- l) Name the important reactions that are catalyzed by pyridoxal phosphate.



2. a) Complete the following with suitable mechanism :

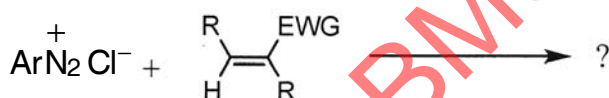


- b) Compound A on heating in 1-methyl pyrrolidine with tetrabutyl ammonium benzoate yields compound B. Explain the observations.

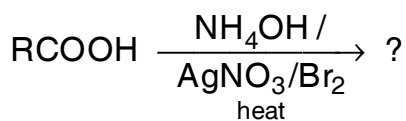


- c) With suitable mechanism, explain the role of DCC in the formation of anhydrides from carboxylic acids. (4+4+4=12)

3. a) Complete the following with suitable mechanism :



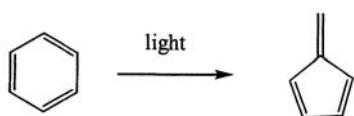
- b) Predict the products for the following reactions. Justify your answer.



- c) With suitable example, explain allylic bromination reaction. (4+4+4=12)

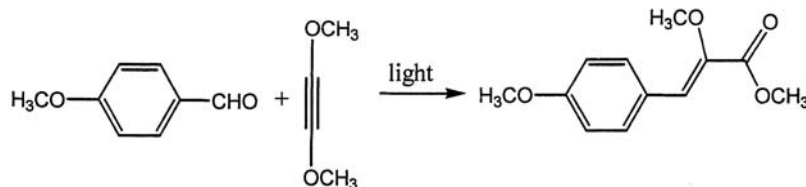
4. a) Under photochemical condition trans alkene is less stable than cis alkene. Justify.

- b) Write a reasonable mechanism for the following :

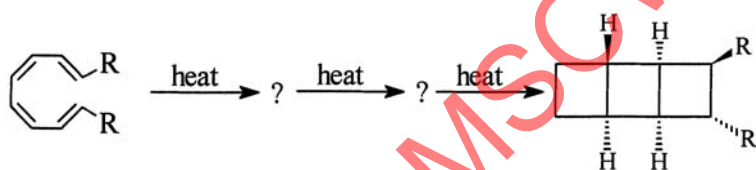




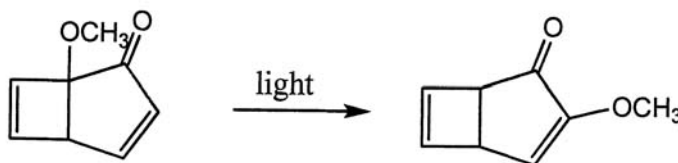
c) Write a reasonable step for the following conversions.



5. a) Show that HOMO-LUMO interaction occur during [4+2] cycloaddition of diene possessing electron donating group and dienophile possessing electron withdrawing groups.
- b) Using FMO approach prove that [1, 3] – sigmatropic rearrangement is antarafacial under thermally condition.
- c) Show what is happening in each step for the following concerted electrocyclic transformations ? (5+3+4=12)



6. a) How pyridoxal phosphate is useful in dealdolization of serine ?
- b) With suitable examples, discuss the mechanism of [3, 3] [5, 5] sigma tropic rearrangement.
- c) Discuss the role of tetrahydrofolic acid in converting homocysteine to methionine. (4+4+4=12)
7. a) What happens when $\text{RCOCH}_2\text{R}'$ react with nitrous acid ? Give mechanism.
- b) Write a reasonable mechanism for the following :



- c) Draw the Jablonski diagram and define the terms phosphorescence and fluorescence. (4+4+4=12)
-