

III Semester M.Sc. Examination, January 2019
(Semester Scheme) (CBCS)
CHEMISTRY

301-OC : Organic Reaction Mechanisms

Time : 3 Hours

Max. Marks : 70

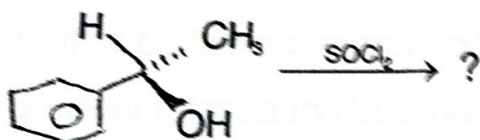
Instructions : Answer question No. 1 and any five of the remaining.

1. Answer any ten of the following :

(10×2=20)

a) What is allylic rearrangement reaction ? Explain with a mechanism.

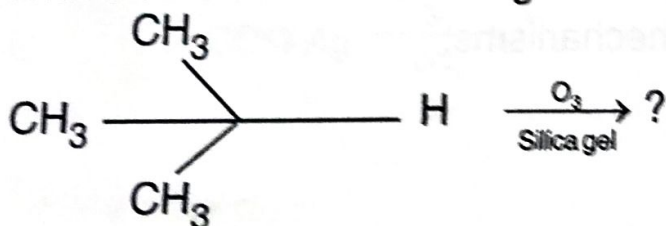
b) Predict the product and propose a mechanism.



c) What is the product of the following reaction ? Suggest a mechanism for its formation.



d) With a suitable mechanism give the product of the following reaction.



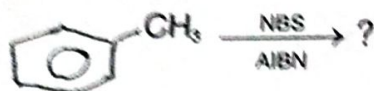
e) What is Norrish type II reaction ? Explain with suitable example.

f) How benzene gets converted into fulvalene photochemically ? Explain with a mechanism.

g) What is oxa-di- π -methane rearrangement ? Explain with a mechanism.

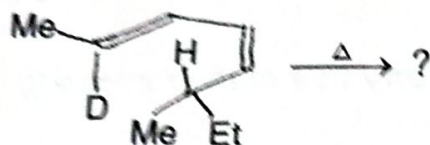


h) Predict the product and propose a mechanism.

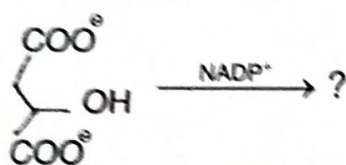


i) With a suitable example give the mechanism of Claisen rearrangement.

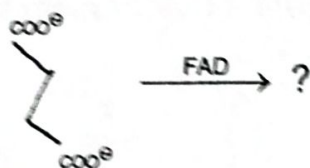
j) Predict the product and propose a suitable mechanism.



k) Suggest a suitable mechanism for the following conversion.

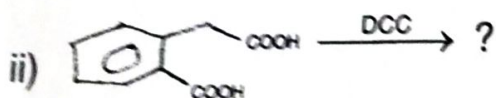
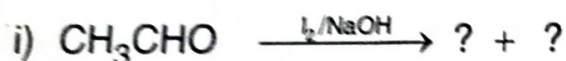


l) Give the product and a mechanism for the following reaction.



2. a) Give a comparative account of SE1, SE2 and SEi mechanisms.

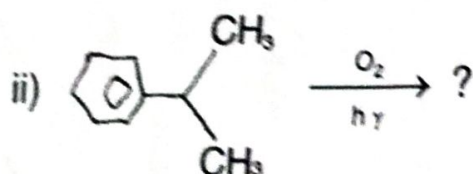
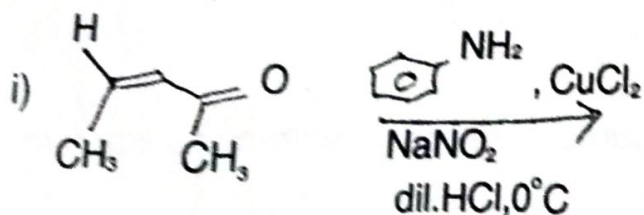
b) Predict the products and propose mechanisms.



(4+6=10)

3. a) Write briefly on the mechanistic aspects of Sandmeyer reaction.

b) Predict the products and propose mechanisms.

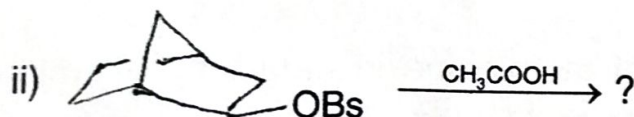


(4+6=10)



4. a) Draw the Jablonski diagram. Explain in detail all the possible transitions which can occur in a photochemical reaction.

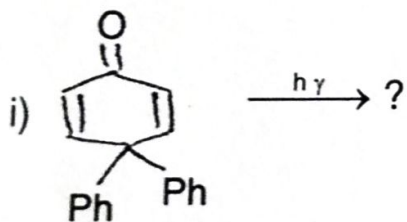
b) Predict the products and propose mechanisms.



(4+6=10)

5. a) With a suitable example give the mechanism and the stereochemistry of the product formed in Paterno-Buchi reaction.

b) Predict the products and propose mechanisms.



(4+6=10)

6. a) Write a note on :

i) Mechanism of [2+2] - Cycloaddition reaction.

ii) Mechanism of aza-Cope rearrangement reaction.

b) Give an account of regio-, enantio- and endo- selectivities in Diels-Alder reaction.

(6+4=10)



7. a) Sketch the mechanism of formation of non-oxidative decarboxylation of α -ketocarboxylates by thiamine pyrophosphate.
- b) With a suitable example, explain how vitamin K_{10} coenzyme assists the transfer of a carboxyl group to its substrates in nature.
- c) With the help of FMO approach and a suitable example, explain the mechanism of Walk rearrangement reaction. **(4+3+3=10)**
8. a) Explain how coenzyme-A assists transfer of an acyl group to its substrates in biological systems.
- b) Give a brief account of formation of methionine in nature by Vitamin- B_{12} coenzyme, N^5 -Methyl tetrahydrofolate and SAM^+ .
- c) Sketch the mechanism of transamination of amino acids by PLP. **(3+3+4=10)**

