UUCMS No

B.M.S. COLLEGE FOR WOMEN
BENGALURU -560004

III SEMESTER END EXAMINATION – APRIL - 2024

M.Sc. CHEMISTRY- ORGANIC REACTION MECHANISMS
(CBCS Scheme – F+R)

Course Code: MCH301T **QP Code: 13006**
Duration: 3 Hours **Max. Marks: 70**

Instruction: Answer Question No. 1 and any FIVE of the remaining.

1. Answer any *TEN* questions **(2×10 =20)**

a) With a suitable example, give the mechanism of nucleophilic substitution at a vinylic carbon.

b) Illustrate SEi mechanism with suitable example?

c) What is Haller-Bauer reaction? Propose a suitable mechanism.

d) Predict the products in the following reaction and justify:

e) Illustrate oxa-di-π-methane rearrangement with relevant example.

f) Write the mathematical expression for quantum yield and elaborate.

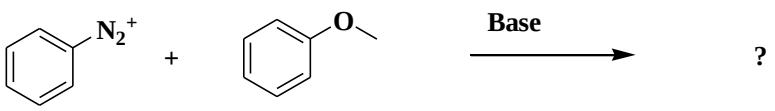
g) Outline claisen rearrangement with suitable mechanism.

h) Enumerate the terms suprafacial and antarafacial.

i) Sketch the frontier orbitals of ethylene.

j) Write a short note on "reactivity at bridge-head position"

k) Identify the products with a proper mechanism:



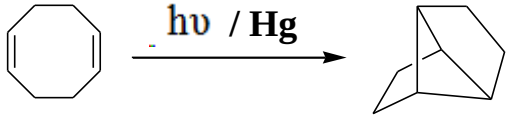
l) Formulate the mechanism of NAD+ catalysed oxidation of maleic acid.

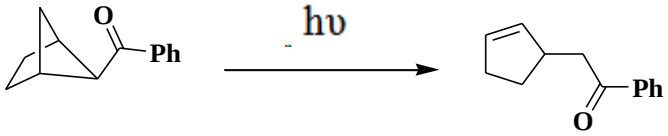
2. a) What are nitrenes? How are they generated? Explain any two reactions.

b) Discuss the mechanism of SE1 and SE2 reactions with suitable examples. **(5+5=10)**

3. a) Outline the various processes involved in photochemical excitation reactions by using jablonski diagram.

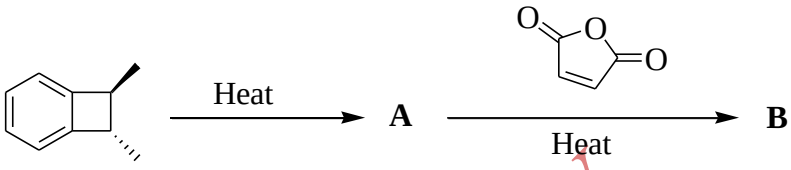
b) Suggest the mechanism of the following reactions:

i. 

ii. 

(5+5=10)

4. a) Predict the products and suggest a mechanism:



b) With the help of correlation diagram, predict the con-rotatory interconversion of 1,3-butadiene to cyclobutene. Is the reaction thermally or photochemically allowed? **(5+5=10)**

5. Write a short note on the following:

a) Halogenation at an alkyl carbon and an allylic carbon

b) Sandmeyer reaction.

c) Gomberg-Bachmann reaction. **(4+3+3=10)**

6. a) Discuss briefly on hydrogen exchange and migration of double bonds in an electrophilic substitution at an aliphatic carbon.

b) How DCC can be employed in the synthesis of anhydrides?

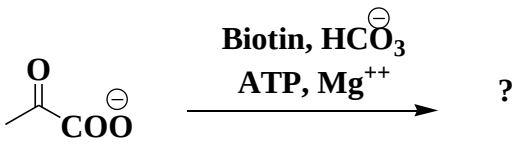
c) Write a note on photo rearrangement of benzene. **(4+3+3=10)**

7. a) What is photochemical cyclohexadienone rearrangement? Mention its application in the synthesis of any one natural product.

b) Using FMO approach and with suitable examples, explain whether $[\pi^4s+\pi^2s]$ and $[\pi^4s+\pi^2a]$ reactions are thermally allowed or not.

c) Describe Walk rearrangement. **(4+3+3=10)**

8. a) Predict the products and write suitable mechanisms.



b) Give the brief account of carbon free radicals at the bridge heads.

c) Discuss neighbouring group participation and its mechanism with a suitable example.

(4+3+3=10)

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