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**CHH 502**

III Semester M.Sc. Examination, December 2018
CHEMISTRY
(CBCS – 2016-17 Syllabus)
Organic Reaction Mechanism and Heterocyclic Chemistry

Time : 3 Hours

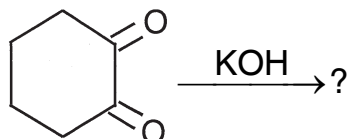
Max. Marks : 70

Note : i) Answer Part – **A** and **any four** questions from Part – **B**.
 ii) Figures to the **right** indicate marks.

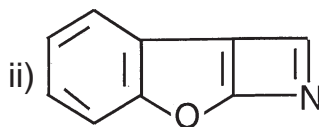
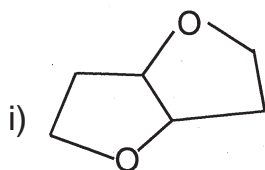
PART – A

1. Answer **all** the sub-divisions. **(9×2=18)**

- a) Employing FMO method predict the thermal interconversion of butadiene to cyclobutene is con-rotation or dis-rotation.
- b) Explain Norrish Type-I reaction.
- c) Triplet excited state is more stable than singlet excited state ? Give reason.
- d) Give evidence to show that Favorskii rearrangement involves cyclopropanone intermediate.
- e) Predict the product in the following reaction



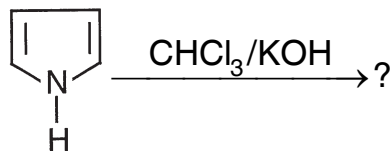
- f) 'Benzoin condensation is specifically catalyzed by cyanide ion'. Justify this statement.
- g) Name the following heterocycles :



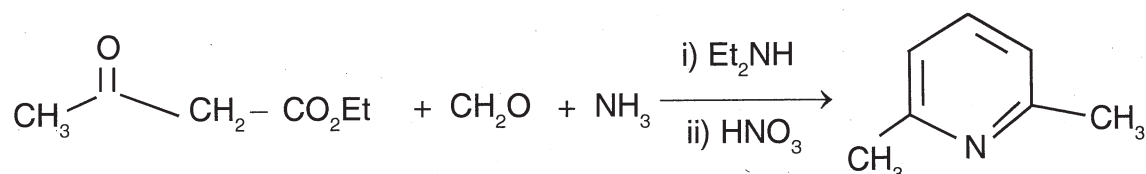
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h) Predict the product in the following reaction



i) Suggest a suitable mechanism for the following reaction :



PART – B

Answer **any four** questions :

(4×13=52)

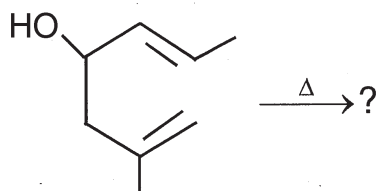
2. a) With the help of correlation diagram show that $\pi^4s + \pi^2s$ cycloaddition is thermally allowed process.

b) What is Barton reaction ? Explain its synthetic utility taking suitable examples.

(7+6=13)

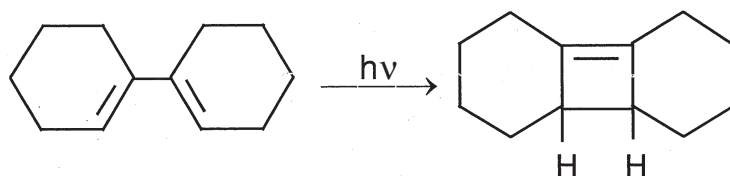
3. a) How do you analyze sigmatropic rearrangement. Explain whether the 1, 5-hydrogen shift by suprafacial mode is thermal or photochemical.

b) Predict the product in the following reaction



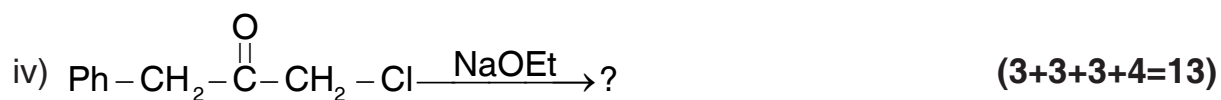
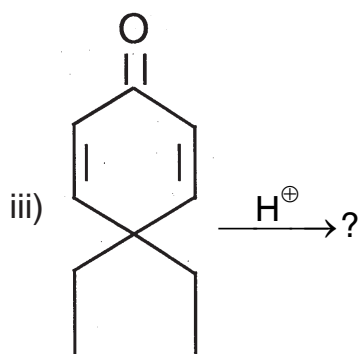
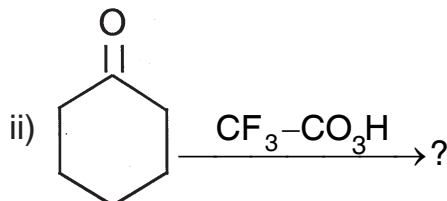
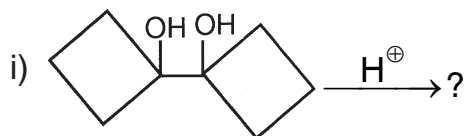
c) Explain whether the following reaction proceeds by con-rotation or dis-rotation ?

(7+3+3=13)

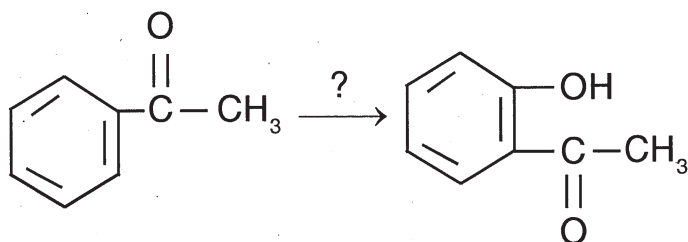




4. a) Predict the product in the following and suggest mechanism.



5. a) How do you achieve the following transformation. Suggest mechanism.



b) Explain the mechanism and synthetic utility of the following reactions by taking suitable example.

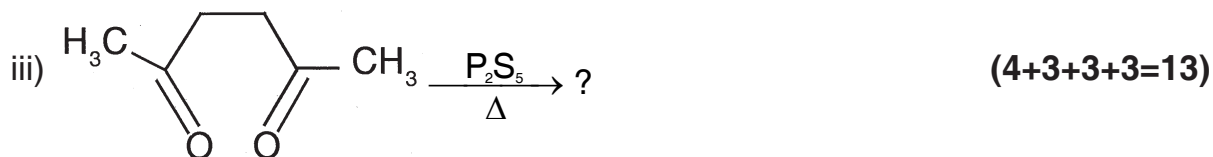
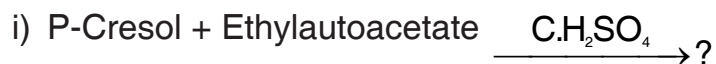
i) Prevost hydroxylation

ii) Sharpless asymmetric epoxidation ?

(5+4+4=13)



6. a) Discuss the mechanism of Fischer indole synthesis.
b) Predict the product in the following reaction and suggest mechanism in each case.



7. a) Explain the mechanism of Hantzsch pyridine synthesis.
b) Explain any one synthesis of azitidine and give any two of its important reactions.
c) Outline the synthesis of pyrimidine. Explain any two reactions of it with mechanism. (4+4+5=13)
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