

5622

M.Sc. (Previous) Examination, 2024

CHEMISTRY

Second Paper-CH-402

(Organic Chemistry)

Time Allowed: Three Hours

Maximum Marks: 100

Attempt any five question in all selecting one question from each unit. All question carry equal marks.

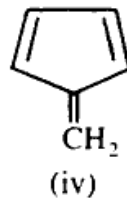
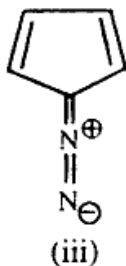
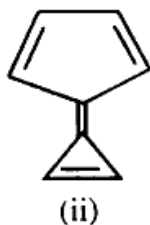
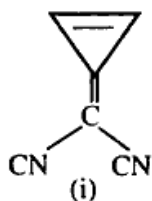
Note: In each question paper 10 questions will be set. Candidates have to answer 5 questions selecting atleast one question from each unit.

No supplementary answer book will be given to any candidate. Hence the candidates should write the answer precisely in the main answer book only.

All the parts of one question should be answered at one place in the answer book. One complete question should not be answered at different places in the answer book.

## UNIT-I

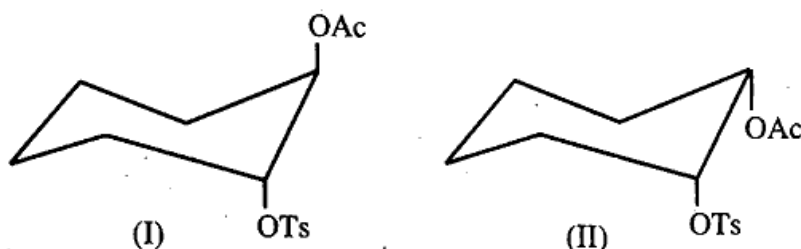
1. (a) The given compounds are aromatics or non-aromatics and why? Explain. [2½×4=10]



- (b) Discuss alternate and non-alternate hydrocarbons. [5]
- (c) Account the aromaticity of 'azulene'. [5]
2. (a) Discuss conformation of cis- and trans- decalins. [10]
- (b) Write explanatory notes on - [2×5=10]
- (i) Stereochemistry of spiranes
- (ii) Optical activity of allenes

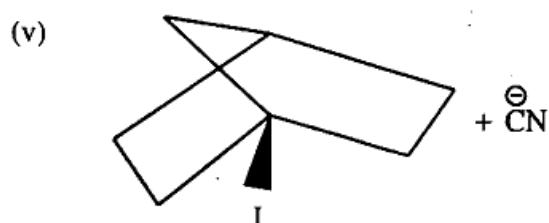
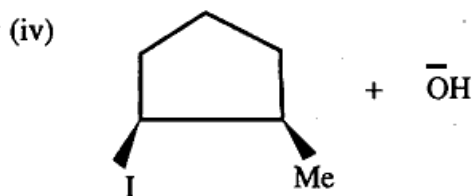
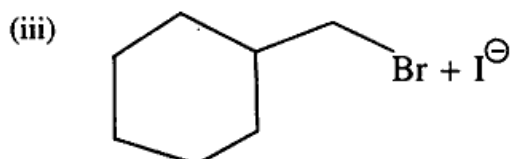
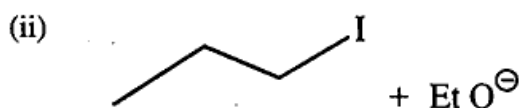
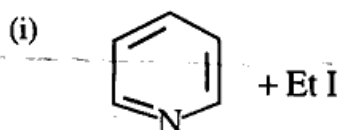
## UNIT-II

3. (a) What are carbocations and nitrenes? How are they formed? Give two methods of each. [2×5=10]
- (b) Write notes on the following - [2×5=10]
- (i) Taft equation
- (ii) Anchimeric assistance
4. (a) Explain, why the trans isomer (I) undergoes acetolysis 670 times faster than the cis isomer (II), and that the product has the (cis) stereochemistry in both the cases? [10]



Ts = p-Toluenesulphonyl

- (b) Predict the products of the following  $S_N2$  reactions - [2×5=10]

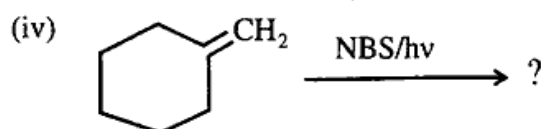
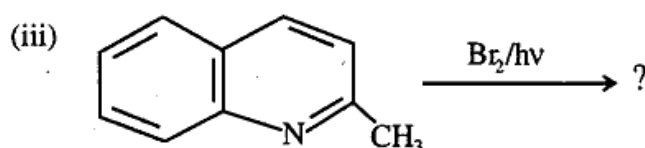
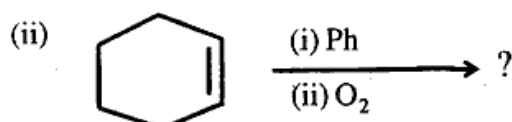
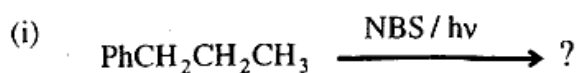


### UNIT-III

5. (a) Discuss  $SE^2$  mechanism and the factors governing it. [10]  
 (b) Write short notes on the following - [2×5=10]

- (i) Vilsmeier reaction  
 (ii) The von Richter rearrangement

6. (a) Predict the product(s) in the following reactions - [2½×4=10]



- (b) Write notes on the following - [2×5=10]

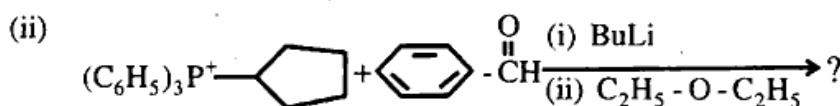
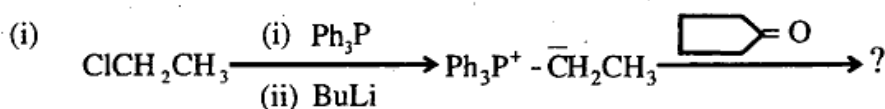
- (i) Neighbouring group assistance  
 (ii) Hunsdiecker reaction

### UNIT-IV

7. (a) Write the structure of the major product and the more stable transition state during bromohydrin formation of propene. Is this reaction regioselective? [10]

- (b) Discuss the mechanism of Michael addition reaction in detail. [10]

8. (a) Complete the following equations by writing the products formed - [2×5=10]



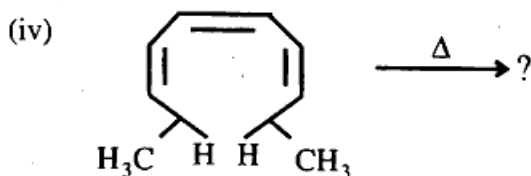
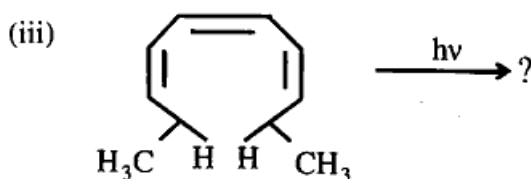
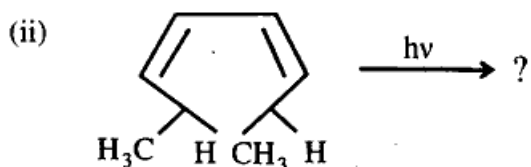
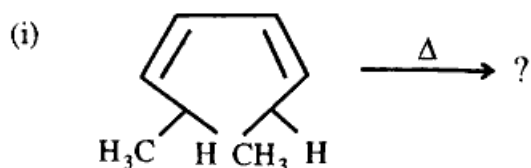
- (b) Discuss the following in detail - [2×5=10]

- (i) E1cB mechanism  
 (ii) Pyrolytic mechanism

## UNIT-V

9. (a) With the help of correlation diagram and FMO method show that Diels-Alder reaction is a thermally allowed process. [5+5=10]

(b) Give product with its stereochemistry in the reactions given below. [2×5=10]



10. Explain -

(i) Huckel-Mobius method in sigmatropic rearrangements [10+10=20]

~~(ii)~~ Ene reaction