

[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 7245

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Unique Paper Code : 2173010040

Name of the Paper : REACTIVE INTERMEDIATES OF ORGANIC CHEMISTRY

Name of the Course : B.Sc. (Prog.) Industrial Chemistry

Semester : VIII

Duration : 2 Hours

Maximum Marks : 60

Instructions for Candidates

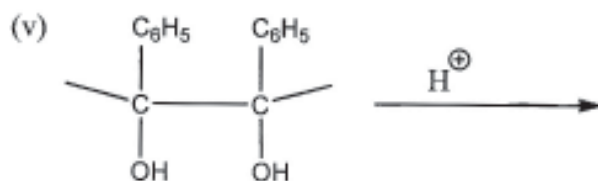
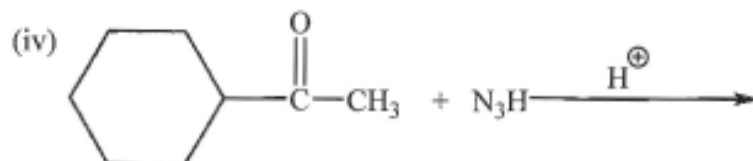
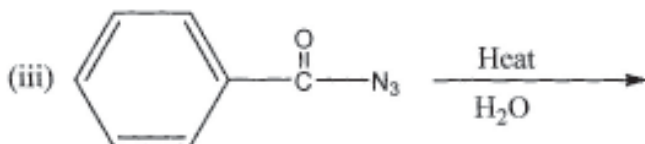
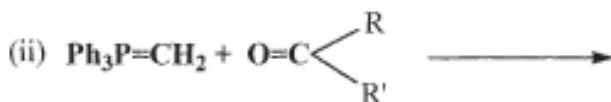
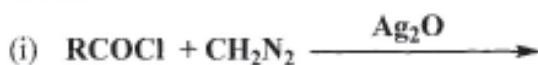
1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **four** questions.
3. **All** questions carry equal **15** marks.
4. Attempt all parts of a question together.

Q1. (a) Write down the structure of the following compounds:

- (i) Bicyclo [2.3.1] octane
- (ii) Spiro [2. 3] hexane
- (iii) Bicyclo [2. 1. 1] hexane
- (iv) Spiro [3. 3] heptane
- (v) Bicyclo [1. 1. 1] pentane

(b) Describe the step-by-step mechanism of the Hofmann rearrangement, using a specific example to illustrate the process. (10, 5)

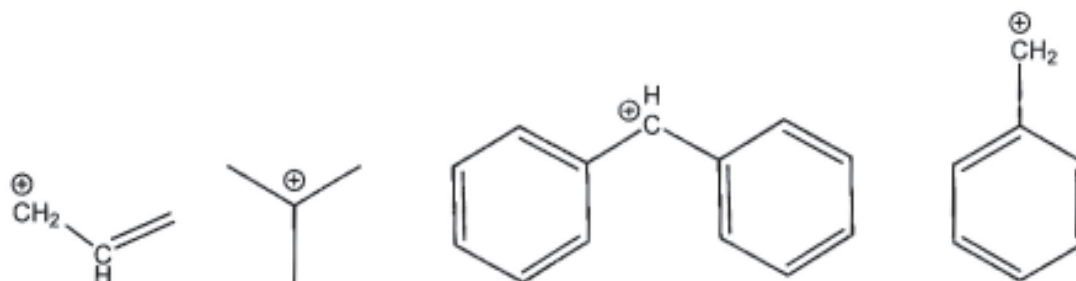
Q2. Complete the following reactions, identify the name reaction and reactive intermediate involved.



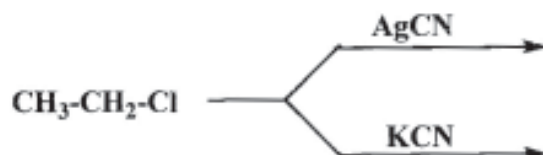
(3 X 5)

P.T.O.

- Q3. (a) Define Bredt's rule. Explain its role in determining the reactivity and stability of bridge head carbocations.
 (b) Discuss methods of generation, structure with hybridization and geometry of radical.
 (c) Explain in detail how molecular rearrangement takes place in monocyclic systems with a suitable example? (5, 5, 5)
- Q4. (a) illustrate the addition and insertion reaction of carbene by taking suitable example.
 (b) Compare the reactivity of sulphur and phosphorous ylid. Explain why cyclohexanone on reaction sulphur and phosphorous ylid gives different product?
 (c) Define the HSAB principle and classify the following as hard or soft bases: methyl carbanion, an enolate ion, and a cyanide ion. Explain briefly how HSAB helps in understanding their behaviour as nucleophiles. (5, 5, 5)
- Q5. (a) Discuss the various factors affecting the stability of carbocation. Arrange the following carbocations in the order of increasing stability and give reason for your answer.



- (b) Define Baldwin rule. Based on this rule, which cyclization pathway is expected to be favoured: the 5-exo-tet or the 6-endo-tet route?
 (c) What are ambident nucleophile explain by taking cyanide as example? Give the product in the following cases:



(5, 5, 5)

- Q6. Write short note on any **three** of the following
 (a) McMurry coupling
 (b) Peterson olefination
 (c) Beckmann rearrangement
 (d) Wagner-Merwin rearrangement

(5 X 3)