[This question paper contains 2 printed pages.]

**Your Roll No.....**

**Sr. No. of Question Paper : 7922** **L**

Unique Paper Code : 2173010040

Name of the Paper : REACTIVE INTERMEDIATES OF ORGANIC CHEMISTRY

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

Semester : VIII

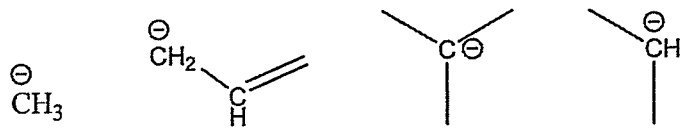
Duration : 2 Hours Maximum Marks : 60

**Instructions for Candidates**

**छात्रों के लिए निर्देश.**

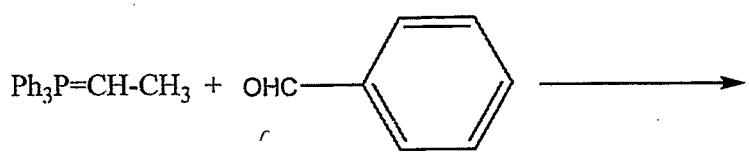
1. Write your Roll No- on the top immediately on receipt of this question paper.
2. Attempt any four questions.
3. All questions carry equal 15 marks.
4. Attempt all parts of a question together.

Q1. a) Differentiate between classical and non-classical carbocation with suitable examples.
b) Explain how neighboring group participation proceeds through sigma bond and phenyl ring?
c) Discuss the various factors affecting the stability of carbanion. Arrange the following carbanions in the order of increasing stability and justify your answer.



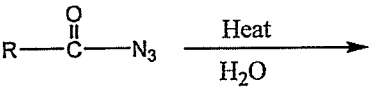
(5, 5, 5)

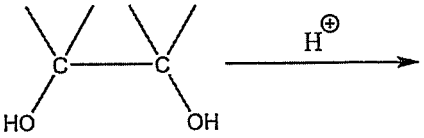
Q2. Complete the following reactions, identify the name reaction and reactive intermediate involved.



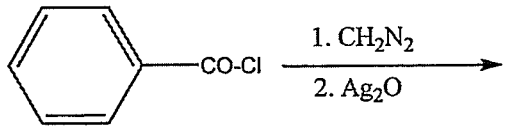
(i)

*P.T.O.*

(ii) 


(iii) 


(iv) $2\ CH_3\text{-}CHO \xrightarrow{TiCl_4}$

(v) 


(5 X 3)

Q3. a) Write the structure of following bicyclic compounds
(i) Bicyclo [2.3.1] octane
(ii) Bicyclo [2.2.1] heptane
(iii) Bicyclo [4.2.1] nonane
(iv) Spiro [2,3] hexane
(v) Spiro [2.2] heptane

b) An alkene is formed when phosphorus ylide reacts with a carbonyl compound, whereas a sulphur ylide yields an epoxide on treatment with a carbonyl compound. Explain with mechanism.

(10, 5)

Q4. (a) Describe methods of generation, structure with hybridization and geometry of carbene.
(b) Outline the mechanism of the Beckmann rearrangement. Use a suitable example to demonstrate the anti-periplanar migration of the substituent group.
(c) Define Bredt's rule. Explain the reactivity and limitation of bridge head carbocation with reference to Bredt's rule.

(5, 5, 5)

Q5. a) What are the starting materials and the main product of the McMurry coupling reaction? Briefly state the role of low-valent titanium in this transformation.
b) State the HSAB principle and classify the following species as hard or soft: $H^+$, $CH_3^+$, $NH_3$, and $I^-$. Explain how HSAB helps predict the preferred site of electrophilic attack in conjugated systems.
c) Define Baldwin's rule. What are the three criteria's used by Baldwin for ring closure reaction?

(5, 5, 5)

Q6. Write short note on any ***three*** of the following
a) Hoffmann rearrangement
b) Baeyer Villager oxidation
c) Schmidt rearrangement
d) Barton deoxygenation and decarboxylation

(3 X 5)

**(300)**