

**CR-2494**

**M. Sc. (Third Semester) Examination, Nov.-Dec. 2018**

**CHEMISTRY**

*Paper : Fourth (Optional)*

**(Organotransition Metal Chemistry)**

*Time Allowed : Three hours*

*Maximum Marks : 40*

*Note : Attempt questions of all two sections as directed.*

**Section-'A'**

**(Short Answer Type Questions) 5×3=15**

*Note : Attempt all the five questions. Each question carries 3 marks.*

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**PTO**

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1. Why transition metal aryls are more stable than corresponding aryls.

**Or**

Distinguish between carbyne and alkylidyne complex.

2. Write down methods of preparation, structure and bonding of Zeise's salt.

**Or**

Free cyclobutadiene is anti-aromatic while cyclobutadiene coordinated to metal atom is aromatic. Explain clearly with suitable example. Give method of preparation of cyclobutadiene complexes. <https://www.ujjainstudy.com>

3. Discuss the structure and bonding in organoboranes compounds.

**Or**

Discuss the nature of bonding in dihydrogen complexes.

4. What are catalyst? Discuss their types with example.

**Or**

What are the general steps involved in the homogeneous catalyst using organometallic compound as catalyst.

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5. Discuss the fluxionality in dieny complexes?

Or

What is ring whizzing? Explain with example.

### Section-'B'

(Long Answer Type Questions)  $5 \times 5 = 25$

*Note : Attempt all five questions. Each question carries 5 marks.*

6. What are organocopper compounds? Discuss their methods of preparation and synthetic applications.

Or

Write down methods of preparation, structure, bonding and important reactions of Fischer carbene complexes.

7. Write down method of preparation properties and bonding in  $\eta^6-C_6H_6$  complexes.

Or

What are transition metal allyl complexes? Give their methods of preparation, properties and structure and bonding.

8. What are transition metal carbonyl hydrides. Discuss their methods of preparation, structure and bonding and importance reaction.

Or

Write a detailed note on organosilane compounds.

9. Write down the mechanism of hydroformylation reaction of but-1-ene using  $Co_2(CO)_8$  as catalyst.

Or

Write down the mechanism of aerial oxidation of propene in the presence of  $PdCl_2$  and  $CuCl_2$  in dil. HCl.

10. What do you mean by stereochemical non-rigidity? How can it be detected with the help of NMR spectroscopy.

Or

What is fluxionality? Discuss it in  $\eta^2$ -olefin complexes.