MANIPAL
ACADEMY of HIGHER EDUCATION
(Deemed to be University under Section 3 of the UGC Act, 1956)

Reg. No.										

DEPARTMENT OF SCIENCES, II SEMESTER M.Sc (CHEMISTRY)
END SEMESTER EXAMINATIONS, JUNE 2019
SUBJECT: ORGANIC CHEMISTRY II [CHM 4204]
(REVISED CREDIT SYSTEM-2017)

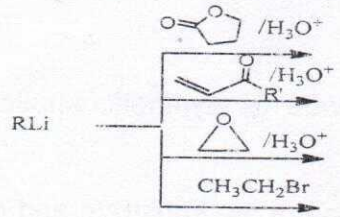
Time: 3 Hours Date: 10-06-2019 MAX. MARKS: 50

Note: (i) Answer **ALL** questions
(ii) Write reactions, structures, and mechanisms wherever necessary

1A. Discuss the aromaticity, bonding and electrophilic substitution reactions of metal cyclopentadiene complexes.

1B. i) Give Dotz reaction. Explain the mechanism.
ii) Explain the structural features of metal-alkyne complexes.

1C. i) Describe the general properties of main group organometallics.
ii) Predict the product in the following reactions.



[3+3+4]

2A. Give two synthetic methods for the following metal complexes.
i) Metal-alkene complexes
ii) Metal-carbyne complexes
iii) Metal-cyclooctatetraene complexes

2B. i) Distinguish between Fischer and Schrock carbenes.
ii) Give two synthetic applications of organosilicon compounds.

2C. i) Describe the chemical properties, modes of co-ordination and important chemical reactions of metal arene complexes.
ii) Write the expected products in the following reactions.

a) $R\text{-}CH{=}CH_2 + B_2H_6 \xrightarrow{H_3O^+} ?$

b) $H{-}{\equiv}{-}H \xrightarrow[80\ ^0C]{Ni(CN)_2\ ,\ CaC_2} ?$

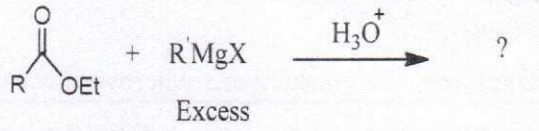
[3+3+4]

3A. Write the nomenclature pattern used for sigmatropic reactions using suitable examples. Give the mechanism of Cope rearrangement using FMO theory.

3B. Justify the statement by taking suitable examples; Mechanism of pericyclic reaction change depending on odd or even number of conjugated double bonds.

3C. i) What is 3c-2e bond? Explain with an example of organometallic compound exhibit this type of bonding.

ii) Predict the products and explain the mechanism of the following reaction.



[3+3+4]

4A. Explain Pd-catalyzed C-C bond forming reactions taking suitable examples. Highlight the reaction mechanism.

4B. Sketch and explain suprafacial and antarafacial 1,3-shift of alkyl group. Comment on symmetry allowed pathway.

4C. Draw Woodward Hoffman correlation diagram for the reaction of two ethylene molecules under thermal condition

[3+3+4]

5A. What is directed ortho metalation reaction? Write its synthetic applications and mechanism for one of the reactions

5B. Describe Baylis-Hillman reaction. Explain the scope of the substrate and mechanism of this reaction.

5C. i) Write the reaction condition and mechanism of Swern oxidation.

ii) Explain the role of phase transfer catalysts in organic synthesis.

[3+3+4]

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