PG (NEW) CBCS
M.Sc. Semester-III Examination, 2019
CHEMISTRY
PAPER: CEM-302
(Organic Special)

Full Marks: 40 **Time: 2 Hours**

GROUP- A

Answer any four of the following questions: **2×4=8**

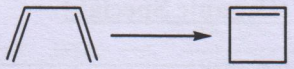
1. Define supra and antra facial processes in sigmatropic reactions.
2. Write the Woodward-Hoffmann selection rule for cycloaddition reaction.
3. Write down Yukawa-Tauno equation.
4. Why ferrocene is more stable than cobaltocene?
5. What is an 'ene' reaction? Illustrate with an example.
6. Why TMEDA (tetra methyl ethylene diamine) is required for dilithiation of ferrocene?
7. Write the essence of Huckel MO theory.
8. Why Ferrocifen is ten time more anticancer active than its organic analog.

GROUP-B

Answer any four of the following questions: **4×4=16**

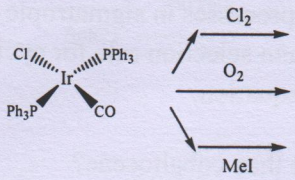
9. Write down the Woodward-Hoffmann selection rules for H-and C-migration in sigma tropic reaction.
10. Draw the pi-molecular orbital diagram of cyclopentadienyl radical indicating symmetry of molecular orbitals, electron occupancy, node of molecular orbital wave functions, SOMO and LUMO and explain the feasibility of [1,5] hydrogen shift of cyclopentadinene system in thermal condition using the above pi-molecular orbital.
11. Write down the Hammett equation and its Taft modification.

12. Write the orbital correlation diagram of the following reaction in thermal condition.



13. a) Describe the oxidative addition reaction in organometallic reaction.

b) Give the products of following reactions:

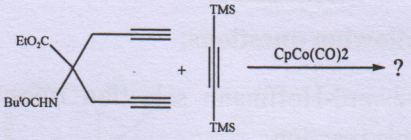


14. What is organometallic insertion reaction? Explain with an example. What is the oxidation state of iron in ferrocene? Give two synthetic routes for ferrocene.

15. Describe nucleophilic addition of metal complex using CO as a ligand. What are Green–Davies–Mingos rules for nucleophilic addition?

16. Give the products of following reactions:

a)



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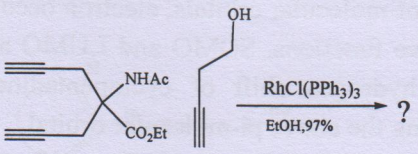
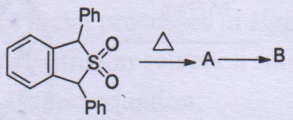


GROUP-C

Answer any four of the following questions: **8×2=16**

17. What is endo rule in cycloaddition reaction? Find out A and B in the following reactions:

a)



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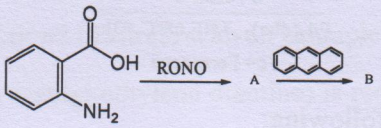

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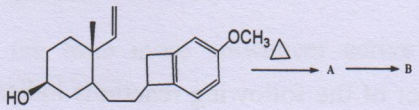
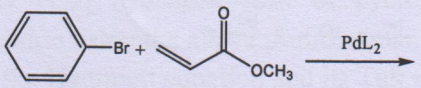


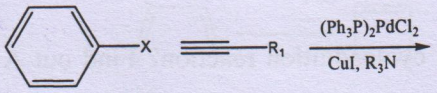
18. Draw the molecular orbital diagram of ferrocene. Write a note on Suzuki coupling reaction.

19. Complete the following reactions. Give plausible mechanism for each.

a)



b)



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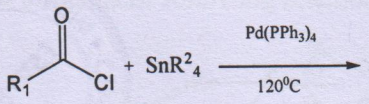

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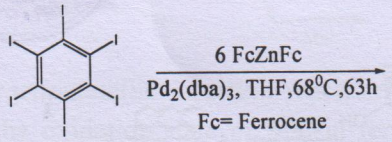


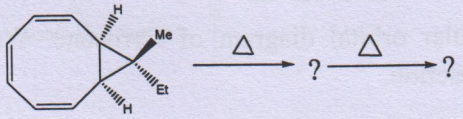
20.a) Write the note on following:

i) Claisen rearrangement

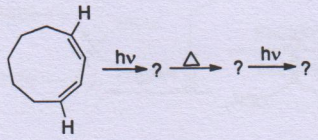
ii) oxy cope reaction.

b) Predict the product of the following reactions indicating Frontier orbital interactions.

i)



ii)



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