

M.Sc. DEGREE (CSS) EXAMINATION, MARCH 2013**First Semester**

Faculty of Science

Branch—Chemistry

AN 1C 01/AP 1C 01/CH 1C 01/PH1 01/POH 1C 01—ORGANO METALLICS AND
NUCLEAR CHEMISTRY

(Common to all Branches of Chemistry)

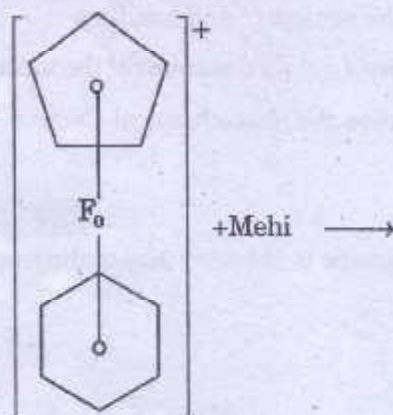
[2012 Admissions]

Time : Three Hours

Maximum : 30 Weight

Section A*Answer any ten questions.**Each question carries a weight of 1.*

1. What is the distinguishing features of ferrocene and Ruthacene ?
2. What is meant by hapticity of ligand ? Explain with *one* example.
3. What is oxidative addition in organometallic compounds ? Give *one* example.
4. Predict the product of the nucleophilic addition.



5. Explain Wacker Process with suitable example.
6. Explain Fischer-Tropsch reaction.
7. Give *two* examples for condensation polymers based on ferroene.
8. How is organometallic polymers prepared by ring opening ? Give suitable example.
9. Describe the role of (a) cytochrome P-450 and catalases in biological systems.
10. Give *two* examples for MRI agents.

Turn over

11. Explain the biological function and toxicity of chromium and mercury.
12. U^{235} undergoes nuclear fission by thermal neutron but U^{238} does not why?
13. Slow neutrons have high reaction cross-section. Why?

(10 × 1 = 10)

Section B

*Answer any five questions.
Each question carries a weight of 2.*

14. Give a brief account of formation and nature of bonding of dinitrogen complexes.
15. Explain carboxylation and decarboxylation in the core of organometallic compound with suitable example.
16. Describe Tolman catalytic loops and its importance with suitable example.
17. What are organometallic dendrimers? How are they prepared?
18. Give the mechanism of binding of O_2 by hemocyanin.
19. Explain how cis platin prevent the growth of cancerous cells.
20. Explain the principle and working of GM counter.
21. Write note on carbenes and carbyne complexes.

(5 × 2 = 10)

Section C

*Answer any two questions.
Each question carries a weight of 5.*

22. How is ferrocene synthesised? Discuss the structure and bonding.
23. With suitable experimental evidences, give a detailed account of the mechanism of Walker process.
24. Distinguish between PS I and PS II. Discuss the photochemical electron transport chain involving chlorophyll.
25. Write briefly on :
 - (a) Analytical application of radioisotope in industry and radiography.
 - (b) Radiolysis of water.

(2 × 5 = 10)