F 5115 (Pages : 2) Reg. No.....

Name.....

M.Sc. DEGREE (C.S.S.) EXAMINATION, JANUARY/FEBRUARY 2017

First Semester

Faculty of Science

Branch : Chemistry

AN IC 01/AP IC 01/CH IC 01/PH IC 01/POH IC 01—ORGANOMETALLICS AND NUCLEAR CHEMISTRY

(Common to all branches of Chemistry)

[2012 Admission onwards]

Time : Three Hours Maximum Weight : 30

Section A

Answer any **ten** *questions.*
Each question carries 1 *weight.*

1. What is meant by hapticity ? Give one example for pentahapto organometallic compound.
2. Give the structure of $\left[C_2(C_6H_5)_2CO_2(CO)_6\right]$.
3. Explain the concept of isolobal with a suitable example.
4. Give one example for reductive elimination of organometallic compound.
5. What is Wilkinson catalyst ? Give its structure.
6. What is meant by hydroformylation ? Give one example.
7. What are organometallic dentrimers ?
8. What is meant by biological calcification ?
9. Give any two toxic effects of Hg.
10. What is the role of calcium in muscle contraction ?
11. Give the principle of GM counter.
12. How is Nobelium, Berkelium and Lawrencium synthesized ?
13. What is Neutron activation analysis ?

(10 × 1 = 10)

Turn over

Section B

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

14. For many years it is believed to be impossible to prepare denitrogen complexes. Why ? How is $[Ru(NH_3)_5N_2]^{2e}$ prepared ?

15. Explain Wade-Mingos rules with examples.

16. Explain fluxional isomerism with suitable example.

17. Describe Wacker process.

18. How is organometallic polymers prepared by ring opening polymerisation ?

19. "One man's meat is another man's poison." Explain this remark using an essential element in biological system.

20. Write note on metalloenzymes.

21. Explain any two analytical applications of radioisotopes.

(5 × 2 = 10)

Section C

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

22. Discuss the bonding in ferrocene. Explain on the basis of the molecular orbital energy level diagram the cause for kinetic stability of ferrocene.

23. Discuss the mechanism of the intake of oxygen by myoglobin and hemoglobin. How would you account for the diamagnetic character of oxygenated myoglobin and oxygented hemoglobin ?

24. (a) Explain the following organometallic reaction :

    (i) Rearrangement reaction : (ii) Redistribution reaction.

    (b) Write note on Homogeneous and heterogenous organometallic catalysis.

25. (a) Write note on the condensation polymers of ferrocene.

    (b) Explain the chemical effects of nuclear transformations.

(2 × 5 = 10)