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Reg. No.....

Name.....

M.Sc. DEGREE (C.S.S.) EXAMINATION, MAY 2017

Fourth Semester

Faculty of Science

Branch III–Chemistry–Pure Chemistry

CH 4E 01 ADVANCED INORGANIC CHEMISTRY

(2012 Admissions—Regular)

Time : Three Hours

Maximum Weight : 30

Section A

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

1. Distinguish between fluorescence and phosphorescence.
2. Explain the term self assembly. Which are the forces that drive self assembly ?
3. How is fluoride and iron in water detected and estimated ?
4. What are inter halogen compounds ? Give example.
5. Give the characters of the reducible representation for *d* orbital wave functions in a square planar field.
6. Write a note on decomposition reagents.
7. What is meant by Gas phase clusters.
8. State Cramer's rule in EPR spectroscopy.
9. What is Moore's law ?
10. Give the characters for the representation of P_y and P_z orbitals in C_{2v} point group.
11. What is metal complex sensitizer ?
12. Give the procecure for the analysis of Dissolved Oxygen (DO) in water.
13. Suggest a green method for the synthesis of nano silver.

(10 x 1 = 10)

Section B

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

14. Distinguish between primary and secondary air pollutants. What are the methods to monitor air pollution ?
15. Briefly explain the hybridization schemes for sigma and Pi bonding.

Turn over

16. Write a note on the applications of Raman spectroscopy.
17. Discuss the selection rules for electronic transitions. Show that $g \rightarrow g$ and $u \rightarrow u$ are forbidden transitions.
18. Briefly explain charge-transfer states and thexi states.
19. Write a note on Ligand field theory using group theoretical considerations.
20. Briefly explain reactions in non-aqueous solvents with example.
21. What are the important properties and applications of Carbon nanotubes.

(5 × 2 = 10)

Section C

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

22. Give the principle of Mössbauer spectroscopy. How it is helpful in the study of Fe (III) complexes ?
23. Write a note on Linear combination of atomic orbitals in tetrahedral, octahedral and sandwich complexes.
24. Briefly describe the analytical procedures involved in monitoring of water quality.
25. What are nano shells ? How are they classified ? Discuss its characterization methods and applications.

(2 × 5 = 10)