

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86
(For candidates admitted during the academic year 2011 – 12)

SUBJECT CODE: 11CH/PC/SI14

M.Sc. DEGREE EXAMINATION, NOVEMBER 2011
BRANCH IV- CHEMISTRY
FIRST SEMESTER

REG.NO

COURSE: MAJOR CORE

PAPER : STRUCTURAL INORGANIC CHEMISTRY

TIME : 30 MINUTES

MAX.MARKS : 20

SECTION – A

(20x1=20)

TO BE ANSWERED ON THE QUESTION PAPER ITSELF.

Answer all the questions:

I Choose the correct answer:

- Super conductors are
a) Ferromagnetic b) diamagnetic c) antiferromagnetic d) none of these
- Maximum efficiency and maximum voids present in close packing of crystals respectively are
a) hcp, bcp b) simple cubic, hcp c) hcp, simple cubic d) none of these
- The portion of H atoms in a sample cannot be studied by
a) X-ray b) Electron diffraction c) neutron diffraction d) none of the above
- The only ionic metallocene is
a) Ferrocene b) Manganocene c) Chromocene d) none of the above

II State whether True or False:

- MnO is anti ferromagnetic.
- Carbonyl is a better π donor & σ -acceptor.
- Garoline is synthesised by Fischer-Tropsch method.
- Nitrogen and Phosphorus in Phosphazenes are sp^3 and sp^2 hybridised respectively.

III Match the following:

- | | | |
|----------------------|---|---------------------------------------|
| 9. Zeise Salt | - | a) CH_3CHO |
| 10. Reppe's catalyst | - | b) $[Pt(C_2H_4)Cl_3]^-$ |
| 11. Wacker process | - | c) $[Mo_{36}O_{112}(H_2O)_{16}]^{8-}$ |
| 12. Isopolyacid | - | d) Cyclo-oligoemerisation |
| | - | e) Ammonia |

IV Fill in the blanks:

13. _____ have supramolecular assembly.
14. The structure of $[B_{12}H_{12}]^{2-}$ is _____.
15. Polymers containing Carbon, Silicon and Oxygen are _____.
16. Nucleophilic carbenes are known as _____.

V Answer in a line or two:

17. What is Meissner effect?

18. State EAN rule.

19. What is isomorphism?

20. Mention some covalent carbides.



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COURSE: MAJOR CORE

PAPER : STRUCTURAL INORGANIC CHEMISTRY

TIME : 2½ HOURS

MAX.MARKS : 80

SECTION – B

(5x8=40)

ANSWER ANY FIVE QUESTIONS:

1. Derive Bom Lande Equation and explain the importance.
2. Explain the powder method of determining the structure of *NaCl*.
3. Discuss the MO treatment of Ferrocene.
4. Describe the bonding and structure of nitrosyls.
5. Explain the mechanism of Oxo process.
6. Describe the structure of boranes and carboranes.
7. Write an account on the properties and structure of polyacids of Molybdenum.

SECTION – C

ANSWER ANY TWO QUESTIONS:

(2 X 20 = 40)

8. a) Explain stoichiometric crystal defects. (6)
b) Distinguish spinels and inverse spinels. (6)
c) Write a note on Band theory of metals. (8)
9. a) Distinguish Electron and Neutron Diffractions. (6)
b) Write an account on complexes of alkyl, allyl and aryl groups. (9)
c) Discuss the classification of organometallic compounds. (5)
10. a) Explain the preparation, properties and structure of polyacids of tungsten. (6)
b) Write notes on silicates. (8)
c) Discuss the mechanism of cyclo-oligomerisation and Monsanto acetic acid process. (6)

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