

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

SUBJECT CODE: 11CH/PC/SI14

M.Sc. DEGREE EXAMINATION, NOVEMBER 2012
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:

- Absence of an atom or ion from a lattice site is called _____ defect.
a) Schottky b) Frenkel c) F Center d) none
- Electron interact with matter through the _____ forces.
a) nuclear b) coulomb c) magnetic d) all
- Ferrocene is an example of organometallic compound containing _____ metals.
a) inner – transition b) transition c) alkali d) alkali – earth
- The oldest method of obtaining gasoline from H_2 and CO is the _____ process.
a) Fischer – Tropsh b) Mobil c) Zeigler - Natta d) all
- Phospham is a highly cross – linked _____.
a) rubber b) glass c) elastomers d) polyphosphazene

II Fill in the blanks:

- If the vacancy is not a true vacancy, but contains a trapped electron at that site, the imperfection is called as _____ center.
- The most common method of determining the structure of a crystalline solid is _____ diffraction.
- The _____ rule is helpful in predicting the stabilities of metal carbonyls and related compounds.
- Polyhedral Carboranes are derived from _____ ions.
- Oxoprocess is also known as _____.

III Match the following:

- | A | B |
|--|-------------------------|
| 11. Madelung constant | Zeolites |
| 12. Hall effect | TiCl ₄ |
| 13. Metal – Carbon bond | Semiconductor |
| 14. Zeigler – Natta Catalysis | Organometallic compound |
| 15. $M^{n+}(Al_xSi_yO_{2x+2y})^{x-} \cdot ZH_2O$ | Geometry of the crystal |

V Answer in a line or two:

16. What is Neel temperature ?

17. Write the Bragg's law.

18. Define metal dinitrogen complex.

19. What is Wilkinson's catalyst ?

20. Define Phosphazenes.



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TIME : 2½ HOURS

MAX.MARKS : 80

SECTION – B

(5x8=40)

ANSWER ANY FIVE QUESTIONS:

- 1 Account for the close packing crystal type of AX_2 .
2. Explain the Meissner effect in superconductors.
3. Give the structural determination of sodium chloride using powder method.
4. Write the methods of preparation and bonding of metal carbonyls.
5. Describe the structure of carbenes.
6. Elaborate the structural principles in silicates .
7. Explain Wacker process in detail.

SECTION – C

ANSWER ANY TWO QUESTIONS:

(2 X 20 = 40)

8. a) Discuss the types of non – stoichiometric defects. (10)
b) What are alkyne complexes ? Describe the bonding in such complexes. (10)
9. a) Elaborate the molecular orbital treatment of ferrocene. (10)
b) Give the catalytic cycle for Monsanto acetic acid process. (10)
10. a) Write a note on isopolyacids of Molybdate and Tungstate . (10)
b) Explain the preparation of silicones. (10)

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