19P3006

Reg. No ..... Name .....

M. Sc DEGREE END SEMESTER EXAMINATION - OCTOBER 2019

SEMESTER 3 : CHEMISTRY / PHARMACEUTICAL CHEMISTRY

COURSE : **16P3CHET09 : INORGANIC CHEMISTRY - III**

(For Regular - 2018 Admission and Supplementary - 2016/2017 Admissions)

Time : Three Hours Max. Marks: 75

Section A
Answer any 10 (2 marks each)

1. What is Meissner effect?
2. Comment on the structure of $YBa_2Cu_3O_7$ superconductor.
3. Explain the structure of rhenium trioxide.
4. Is $FeCr_2O_4$ a normal or inverse spinel? Justify your answer
5. There is no significant deviations from stoichiometry for group 2 metal oxides unlike 3-d metal oxides. Why?
6. Materials with metal excess and metal deficiency defects are termed as n-type and p-type semiconductors respectively. Why?
7. Discuss how the oxidation state of a metal is related in its ability to form stable metal clusters.
8. Discuss on the structure of Re_3Cl_9
9. What is thermal spalling?
10. What do you mean by porosity of refractory bricks?
11. Give one example for trinuclear and pentanuclear clusters.
12. Classify the following species as closo, nido and arachano based on Wade's rule.
    a) $B_4H_6(CoCp)_2$ b) $B_3H_7[Fe(CO)_3]_2$
13. Predict the structure of $C_2B_{10}H_{12}$ using Wades rule.

(2 x 10 = 20)

Section B
Answer any 5 (5 marks each)

14. Write briefly on Photoconductivity and Photovoltaic effect.
15. Give an account on magnetic properties of monoxides of elements in 3d series..
16. Discuss briefly the various mechanisms for diffusion in solids.
17. Explain how the free energy change vary during the growth of product nuclei in solid state transformation?
18. Explain in detail the structure and bonding present in $[Re_2Cl_8]^{2-}$
19. Discuss on the classification of ceramic materials.
20. Write a note on heteropoly ions. What are heteropoly blues? Give an account of their uses.
21. Describe the synthesis of trimeric phosphazene. Explain its structure and bonding.

(5 x 5 = 25)

Section C
Answer any 2 (15 marks each)

22. Explain the statement that the free-electron theory of Drude and Lorentz was able to account for the optical properties of metals.

23. What are solid electrolytes? Discuss their types and applications.

24. Explain the ring topological approach of born hydrides. How we can explain the bonding in boranes using these approach. Give the styx number and structures of B_5H_{11} and $B_{10}H_{14}$.

25. Explain in detail the magnetic, electrical and optical properties of one dimensional soids by giving suitable examples.

(15 x 2 = 30)