Reg. No ..... Name **17P3606**

MSc DEGREE END SEMESTER EXAMINATION- OCTOBER-NOVEMBER 2017

SEMESTER 3 : CHEMISTRY / PHARMACEUTICAL CHEMISTRY

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

(For Regular - 2016 admission)

Time : Three Hours Max. Marks: 75

Section A
Answer any 10 (2 marks each)

1. What is bioluminescence?
2. Show that supercconductors are diamagnetic.
3. Solid solution of dark-green Cr_2O_3 and colourless Al_2O_3 form brilliant red ruby. Explain the reason for the colour change.
4. 1^{st} order transitions are easy to detect than 2^{nd} order transition. Why?
5. Why does increased pressure reduce the conductivity of K^+ in β alumina more than that of Na^+?
6. Why the monoxides of the metals Fe,Co,Ni and Cu are semiconductors while TiO and VO show electronic conduction?
7. Discuss on the structure of Re_3Cl_9
8. What is cermet?
9. What are carboranes? Mention their synthesis.
10. How is $(SN)_x$ prepared? Explain its conductivity.
11. Predict the structure of $C_2B_{10}H_{12}$ using Wades rule.
12. Draw the structures of exo and endo forms of Se^{2+}.
13. Arrange the following boranes in the decreasing order of their acidity. Give justification for your answer.

    B_4H_6, $B_5H_9^{2-}$, B_6H_{12}.

10 x 2 (20)

Section B
Answer any 5 (5 marks each)

14. Distinguish between low and high temperature superconductors. Comment on the superconductivity in cuprates.
15. Give an account on molecular orbital theory of solids.

16. Briefly explain the fluorite and antifluorite structure
17. Explain the mechanism of conduction in $La_{1-x}Sr_xCoO_{3-y}$
18. Explain in detail the structure and properties of polyatomic zintl ions.
19. Discuss in detail the general method of manufacture of refractory bricks.
20. Describe the synthesis of trimeric phosphazene. Explain its structure and bonding.
21. What is polythiazyl? Explain its structure and properties. Why it is considered as one dimensional conductor?

5 x 5 (25)

Section C
Answer any 2 (15 marks each)

22. Discuss the quantum mechanical approach of zone theory of solids.
23. Give a brief account on a) Order disorder transition, b) Intermetallic compounds and c) Chemical vapour deposition technique.
24. Explain in detail the magnetic, electrical and optical properties of one dimensional soids by giving suitable examples.
25. Give the structure of Borazine and explain the special nature of the bonding in the molecule. Compare the bonding in Borazine with phosphazene molecule.

2 x 15 (30)