

Reg. No

Name

18P405

M Sc DEGREE END SEMESTER EXAMINATION - MARCH 2018
SEMESTER 4 : CHEMISTRY
COURSE : 16P4CHET13EL ; ADVANCED INORGANIC CHEMISTRY
(For Regular - 2016 admission)

Time : Three Hours

Max. Marks: 75

Section A
Answer any 10 (2 marks each)

1. What happens to the C=N stretching frequency in N-salicylidine aniline on complexation with metal ion? Give reasons.
2. Explain photoaquation reaction with suitable example.
3. What is surface plasmon resonance?
4. Suggest a method to synthesize CdS quantum dot.
5. Write down the angular wave functions of P_x , P_y , and P_z Orbitals. Explain θ and ϕ .
6. Draw the A_{1g} molecular orbital of ferrocene.
7. Which is the stronger Lewis acid? BF_3 or BCl_3 . Explain the reason.
8. Which is the strongest acid among various hydrohalic acids? Explain your answer.
9. What is the hybridisation of Aluminium in aluminium bromide? Explain its Structure.
10. Give the all possible geometries for Tetrachloriodate(III) anion. Which is the stable structure? Why?
11. Compare geometry and bond angles in Nitrogen dioxide, nitrite ion and nitryl ion. Explain the reason for the differences.
12. What are spherands? Give examples.
13. What are endohedral and exohedral fullerenes?

(2 x 10 = 20)

Section B
Answer any 5 (5 marks each)

14. Write a note on water photolysis.
15. Explain the mechanism of photochemical reduction of carbon dioxide.
16. What are nano shells? How will you synthesis silica@gold nano shell?
17. Find out the normal modes of vibration of Ammonia molecule and classify them into stretching and bending modes.
18. Explain with the help of MO diagram, why Fluoride is a weak field ligand while CO is a strong field ligand.
19. Illustrate HSAB theory with suitable examples. Explain its application in Coordination Chemistry.
20. Explain in detail about supramolecular chemistry of pyrrole containing macrocycles.
21. Discuss on the importance of molecular recognition in metallo supramolecular chemistry.

(5 x 5 = 25)

Section C**Answer any 2 (15 marks each)**

22. Explain the principle of Mossbauer spectroscopy. How is it helpful in the study of Fe(III) and Fe(II) complexes? Explain with suitable examples.
23. What are quantum dots? How will you characterize them? Discuss the important properties and applications of quantum dots.
24. What is correlation diagram? Construct the correlation diagram for d^2 ion.
25. a) Discuss on the chromatographic separation of fullerenes. (6)
b) Explain in detail the principle and applications of super critical fluid chromatography (9)

(15 x 2 = 30)