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M.Sc (chemistry) PIT (2015 to 2017) (Sem.-2)

Subject Code : CHL-411

Paper ID : [51148]

Max. Marks : 70

1. **SECTION-A is COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **SIX** questions carrying **FIVE** marks each and students have to attempt **ALL** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Q1. What is cooperativity?

Q2. Name essential trace bio elements.

Q3. Define quantum dots. Give their three applications.

Q4. What do you mean by supramolecular chemistry and supramolecular assemblies?

Q5. What is hydrophobic effect? Can you expect the similar phenomenon for other polar solvents? Comment.

Q6. What is reductive elimination reaction? Give an example. What is change in oxidation state of metal atom in this reaction?

Q7. Polyphosphazenes are isoelectronic to polysiloxanes. Comment on consequences.

Q8. Draw the structure of cis-Platin. Write down the oxidation state of metal ion present and its electronic configuration.

Q9. What are cross-coupling reactions? Give an example.

Q10. What do you mean by coordinatively unsaturated compounds? Give an example.

SECTION-B

- Q11. Discuss three different possible pathways of carbonyl insertion into M-C bond and its reverse reaction.
- Q12. Describe the situations when high and low spin Fe(II) are observed in Mb complexes.
- Q13. What are lariat ethers? Why N-pivot lariat ether is less stable compared to C-pivot lariat ether?
- Q14. What are inorganic polymers? Discuss different methods used for synthesis of inorganic polymers. Give three different properties of silicones.
- Q15. Write a short note on MRI agents.
- Q16. What is Shrock carbene? How is it prepared? Give three characteristics of Shrock carbene.

SECTION-C

- Q17. What are Hb and Mb and their deoxy derivatives? Draw and discuss Hb binding curve at different partial pressure of O₂. How does it differ from that of Mb?
- Q18. Illustrate with proper example : thermodynamic versus kinetic selectivity in molecular recognition. What is chelate effect? Explain.
- Q19. What do you mean by olefin metathesis? Discuss the mechanism of olefin metathesis catalyzed by Shrock type carbene and comment on the key intermediate.