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Total No. of Pages : 02

Total No. of Questions : 19

M.Sc (Chemistry) PIT (2015 to 2017) (Sem.-3)

SELF-ASSEMBLED MATERIAL

Subject Code : CHL-503A

Paper ID : [74890]

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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.

SECTION-A

1. What is the difference between molecular chemistry with supramolecular chemistry?
2. Between primary and secondary hydrogen bond, which one is stronger and why?
3. Draw the geometries of donor bifurcated and acceptor bifurcated hydrogen bond.
4. Give examples of cation- π interaction and anion- π interaction.
5. Mention the name of the interaction of the following complex :
$$[\text{Tris}(\text{diazabicyclooctane})]^{3+} \text{ with } [\text{Fe}(\text{CN})_6]^{3-}$$
6. Draw the following dipole-dipole interaction :
Head to tail alignment, Anti-parallel alignment
7. Why 2-rotaxanes are highly stable than 2-pseudorotaxane?
8. What is the driving force for an unfolded, disordered protein to form ordered and folded protein spontaneously?
9. Write the structure of Zundel cation.
10. Arrange the following types of interaction in terms of increasing the stability order: Keesom interaction, Ion-Dipole interaction, Electrostatic interaction, Debye interaction, Hydrogen bond interaction, London interaction.

SECTION-B

11. Briefly describe the salient features of various protein folding models.
12. How many primary and secondary hydrogen bonds are present in the following systems? Predict the number of attractive and repulsive interaction also.
 - a) DDDA-AAA,
 - b) DDA-ADD
13. Briefly describe the terms 'complementarity' and 'preorganisation' in supramolecular chemistry.
14. Indicate α , β and meso position of porphyrin. How many number of α , β and meso position present in porphyrin?
15. Write short note of Tobacco Mosaic virus.
16. Define template reaction. Why template reaction is more important for the synthesis of supramolecular hosts? If any kind of organic base is used instead of metal base, then what would be the fate of the reaction?

SECTION-C

17. Illustrate the synthesis of catenanes. Draw the cartoon representations of following :
1-rotaxane, 4-pseudorotaxane.
18. Write a short note with example of molecular motor. What do you mean by micelles? How it is formed? Explain why micelles are regarded as biological membranes.
19. Give two examples of H-bond directed self assembly. Discuss the thermodynamic aspects of self assembly. Illustrate strict self assembly and self assembly with covalent modification with mechanism.