

15. (a) Explain photoinduced energy transfer process involved in supramolecular photochemistry with neat sketch.

Or

- (b) What are proton wires? Describe with suitable example.

PART C — ($3 \times 10 = 30$)

Answer any THREE questions.

16. What are non-covalent interactions? Give example to each of them and explain.
17. Write notes on (a) metal organic framework based on organometallic systems and (b) crystal engineering of non-linear optics materials
18. Write notes on (a) metalloreceptors and (b) molecular cages.
19. Explain reactive anion receptors in catalysis.
20. Write short notes on the following: (a) photoswitching devices and (b) electroswitching devices.

S.No. 2664

P 16 CHE 1 B

(For candidates admitted from 2016–2017 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Chemistry — Elective

SUPRAMOLECULAR CHEMISTRY

Time : Three hours

Maximum : 75 marks

PART A — ($10 \times 2 = 20$)

Answer ALL questions.

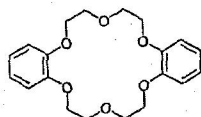
1. What is host-guest chemistry?
2. Define the term "Supramolecular synthons".
3. What is metal organic framework?
4. Give two examples of anionic linkers used in metal-organic frameworks.
5. What are cyclophane receptors?
6. Draw the molecular structure of clax[4] arene.
7. What are supramolecular metallocatalysts?

8. What are the functional groups which facilitate the binding of anions to the receptors?
9. What is semiochemistry?
10. What are photosensitive molecular receptors?

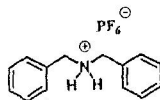
PART B — (5 × 5 = 25)

Answer ALL questions, choosing either (a) or (b)

11. (a) With neat diagram explain why dibenzo-18-crown-6 exhibit higher binding affinity towards dialkylammonium ions shown below?



Dibenzo-18-crown-6



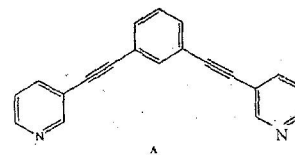
Dibenzyl ammonium hexafluorophosphate

Or

- (b) What is polymorphism? Write a note on pharmaceutical applications of polymorphism.
12. (a) What is “node-and-spacer” approach? Give examples of organic ligands with linear/angular, trigonal and tetrahedral shapes.

Or

- (b) Sketch the likely metal-organic assemble formed by the solution of A and $\text{Pd}(\text{BF}_4)_2$. Given that the masses of the ligand A, Pd and BF_4 are 280.32, 106.41 and 86.99 respectively. ESI-MS $m/z=333.52(4+ \text{ peak})$



13. (a) Describe linear recognition of molecular length by ditopic coreceptor with suitable example.

Or

- (b) What are cryptands? Discuss in detail about dinuclear metal cryptate.
14. (a) With neat sketch, describe supramolecular catalysis process.

Or

- (b) Explain the use of cyclodextrin as molecular reactor.