

2024
M.Sc.
3rd Semester Examination
CHEMISTRY
PAPER – CEM-303
Full Marks:50
Time: 2 Hours
(CEM 303-Advanced Organic Chemistry-II)
Group-A

Answer any **four** questions

2×4 = 8

1. Define α -helix and β -sheet.
2. What are Bolaamphiphiles? Give example.
3. Draw the different types of Hydrogen bonding.
4. What is active site of an enzyme? Explain with an example.
5. Write down few applications of β -CD.
6. What is the major difference between α , β , γ -cyclodextrin? Show the 1,4-glycosidic link in β -CD.

Group-B

Answer any **four** questions

4×4 = 16

7. Describe with an example how the protecting group CBZ can be used for the synthesis of dipeptide.
8. Give example of ionic and dipolar interaction. Define macrocyclic effect and selectivity.
9. What is Kinetic template effect? Why macrocycle formation is favoured over polymerization when using high-dilution techniques?
10. How Cyclam can be synthesized using a suitable template? Write in details about the various parameters of H-bonding.
11. Give an example of Chiral recognition. Give two example of protein aggregation related disease name.
12. How Adamantyl alcohol can be detected through fluorescence in modified cyclodextrin derivative?

Answer any **two** questions

2×8 = 16

13. a) What is green chemistry? b) Write down the twelve principle of Green Chemistry. c) Give an example of Organic Synthesis in aqueous media. (2+6+2)
14. Design and explain the mechanism of a host (naphthalene based) where K^+ can be detected by fluorescence 'ON' and 'OFF'. Design a photoresponsive host molecules and describe its utility in host-guest binding. (4 + 4)
15. Between pentaethylene glycol dimethyl ether, [18] crown 6 and [2,2,2] cryptand which has the higher affinity towards K^+ and why? How micelle is formed? Why β -cyclodextrin is used in drug delivery? (4 + 2+2).
16. i) Partial hydrolysis of pentapeptide gives the following peptide fragments. Write down the structure of the original pentapeptide. Ala-Gly; Val-Ser; Phe-Val-Ser; Gly-Phe. ii) Describe briefly solid state peptide synthesis for any tripeptide. iii) Describe with proper example how DCC can be used in protein synthesis? (2+3+3)

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Internal Assessment-10