

2022

M.Sc.

3<sup>rd</sup> Semester Examination

CHEMISTRY

PAPER – CEM-303 (Organic Special)

Full Marks : 50

Time : 2 Hours

(CEM 303-Advanced Organic ChemistryII)

1. Answer any *four* questions: 2×4 = 8
- (a) What are Bolaamphiphiles? Give example.
  - (b) What are the differences between  $\alpha$  helix and 310 helix?
  - (c) What are the basic requirements for an enzyme model?
  - (d) What is active site of an enzyme? Explain with an example.
  - (e) Give any one example of Enantioselective lipase-catalyzed transesterification reaction.
  - (f) What is the major difference between  $\alpha$ ,  $\beta$ ,  $\gamma$ -cyclodextrin? Show the 1,4glycosidic link in  $\beta$ -CD.
2. Answer any *four* questions: 4×4 = 16
- (a) Give example of ionic and dipolar interaction. Define macrocyclic effect and selectivity.
  - (b) Why macrocycle formation is favoured over polymerization when using high-dilution techniques? Give an example of Kinetic template effect.
  - (c) Write in details about the various parameters of H-bonding. How Cyclam can be synthesized using a suitable template?

(d) Give an example of Chiral recognition. Name two diseases related to protein aggregation.

(e) How Adamentyl alcohol can be detected through fluorescence in modified cyclodextrin derivative?

(f) How will you determine the tertiary or quaternary structure of protein? How receptor and ion channel work at the cell membrane?

3. Answer any *two* questions  $2 \times 8 = 16$

(a) What is green chemistry? Write down the twelve principle of Green Chemistry. Give an example of Organic Synthesis in aqueous media.

2+4+2

(b) Design and explain the mechanism of a host (naphthalene based) where  $K^+$  can be detected by fluorescence 'ON' and 'OFF'. Design a photoresponsive host molecule and describe its utility in host-guest binding.

4 + 4

(c) Between pentaethylene glycol dimethyl ether, 18-crown-6 and [2,2,2] cryptand which has the higher affinity towards  $K^+$  and why? Why  $\beta$ -cyclodextrin is used in drug delivery? Why proline is regarded as a helix breaker?

4 + 2+2

(d) What is the folding funnel hypothesis for protein folding? Write down the procedure for determination of protein's melting point? Write down the procedure for protein synthesis from DNA.

3+3+2

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**Internal Assessment-10**

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