

**M. SC. CHEMISTRY EXAMINATION, 2017**

( 4th Semester )

**ORGANIC CHEMISTRY SPECIAL**

**PAPER - XVI-O**

Time : Two hours

Full Marks : 50

( 25 marks for each unit )

Use a separate answerscript for each unit.

**UNIT - O - 4161**

1. Answer *any five* of the following questions :
  - a) What is apolar/polar ratio ? Comment on its influence on designing of a membrane mimetic organic molecule. 2+3
  - b) What do you understand by the terms  $\alpha$ ,  $\beta$  and  $\gamma$ -turn ? Give a plausible scheme of synthesis of a  $\beta$ -turn-mimic and comment on its functionalities. 2+3
  - c) What is PNA ? Write down a plausible synthetic scheme of  $\alpha$  and  $\gamma$ -chiral PNA. 2+3
  - d) What are bolaform lipids ? Depict a biomimetic design of a bolaform lipid with a phosphocholine head group and give a plausible scheme of its synthesis. 1+1+3
  - e) Write down a membranemimetic design of DPPC with an amide and ether functionality at the linker region. Depict the plausible synthetic route of your proposed designed molecules. 2+3

[ Turn over

[ 2 ]

- f) Write short notes on (*any two*) :  $2 \times 2 \frac{1}{2}$
- i) Pseudoglyceryl cationic lipid
  - ii) Ala-Scan
  - iii) Main Phase Transition Temperature ( $T_m$ ).

**UNIT - O - 4162**

2. Answer *any two* of the followings :

- a) What is vitamers ? Describe the role of vitamin B<sub>1</sub> (thiamine) in the decarboxylation of pyruvic acid to acetaldehyde.  $\frac{1}{2} + 3 \frac{1}{2}$
- b) Comment on the role of vitamin A<sub>1</sub> in the visual cycle with special reference to “wald visual cycle.” 4
- c) Draw the structure of FAD. Discuss the mechanism how FAD convert dihydrolipoate to lipoate in the presence of dihydrolipoyl dehydrogenase ? 1+3

3. a) Briefly explain the terms ‘pharmacodynamics’ and ‘pharmacokinetics’. 2

b) Answer *any one* of the following questions :

- i) What are ‘receptor proteins’ and ‘ion-channels’ ? Explain how they are interrelated. 3
- ii) What are DNA intercalators ? Give an example and explain its mode of action.  $\frac{1}{2} + \frac{1}{2} + 2$

[ 3 ]

- c) Define ‘Phase I reactions’ and ‘Phase II reactions’ in connection with metabolic stability of drugs giving one example in each case. 2
- d) What are ‘prodrugs’ ? Discuss their importance in medicinal chemistry with the help of one example. 2

4. Answer all of the following questions :

- a) What is ‘suicide inhibitor’ ? Give an example.  $1 \frac{1}{2}$
- b) What is the difference between ‘bactericidal’ and ‘bacteriostatic’ drug ? Give an example of each class. 1+1
- c) The combination of sulfanilamide and trimethoprim is better drug candidate – explain. 3
- d) What is  $\beta$ -lactamase ? Give an example of  $\beta$ -lactamase inhibitor with structure.  $1 \frac{1}{2}$