

M. Sc. CHEMISTRY EXAMINATION, 2018

(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

- b) Discuss mechanism of action to penicillin as antibiotic.
Comment on the acid sensitivity of penicillin. $3\frac{1}{2} + 1\frac{1}{2}$
- c) Discuss briefly the types of intermolecular forces involved in the drug binding interaction with target. Mention the role of water in the drug interaction with target. $3+2$
9. Answer *any two* of the following :
- a) Comment on the role of amine functional group in the drug molecule to maintain the ionic and non-ionic equilibria in the biological medium. $1\frac{1}{2}$
- b) What are DNA intercalating agents ? Give one example mentioning its mode of action. $1\frac{1}{2}$
- c) What are the DNA alkylating agents ? Give one example that has been used as anticancer drug. $1\frac{1}{2}$
-

1. Answer *any five* of the following questions:
- a) Write down the salient functional features of the molecular architecture of a membrane lipid. 1
- b) Give a plausible synthetic scheme of the DPPC-mimics with the following linker functionalities :
i) 1-ester-2-amide (ii) 1-ether-2-ester 2+2
2. Give examples of geminally and vicinally anchored aliphatic chains containing cationic lipids and give their plausible synthetic protocols. $2+1\frac{1}{2} + 1\frac{1}{2}$
3. a) Comment on the basic steps towards designing of a peptidomimic molecule. 2
- b) Design and justify the structural mimic of RGD-peptide and give their plausible synthetic scheme. 3

[Turn over

[2]

4. What is depsipeptide ? Give a scheme of stereoisomeric synthesis of α -methyl threonine and α -methylcystein.

1+2+2

5. PNA is a DNA - mimic - Justify. Give an example of a, α , γ - chiral - PNA - monomer and give a plausible synthesis of it.

2+1+2

6. Write short notes on (*any two*) : $\frac{1}{2} \times 2$

(a) β -turn mimic

(b) β -PNA

(c) Peptoid

(d) Gemini-amphiphile

[3]

UNIT – O- 4162

7. Answer *any two* from the following :

a) Name all the water soluble vitamins except Vitamin B-complex. Draw the three forms of vitamin B₆ and their sources. Describe how pyridoxal phosphate catalyzes amino acid metabolism via transamination, decarboxylation and racemization with mechanistic details. 1+2+3

b) Write down the structure of Folic acid (vit-m or B₉). Describe its biochemical function in conversion of homocysteine to methionine and glycine to serine with detailed mechanism. 1+2+3

c) What is the most abundant form of vitamin E ? Write down its structure with suitable stereochemistry. Describe with mechanism how- α tocopherol acts as a breaker of free radical chain reactions or acts as an anti-oxidant. What is final rearranged product of tocopherol radical ?

$\frac{1}{2} + 1 + 3 + 1 \frac{1}{2}$

8. Answer *any two* of the followings :

a) Point out the structural requirement of sulfamides to act as effective antibiotics. Briefly discuss the mechanism of action of sulfamides as antibacterial agent. Why are sulfamides selectively toxic to bacteria ? 2+2+1