[Time: 3 Hours] **[Marks: 70]**

Please check whether you have got the right question paper.

N.B: 1. **All** questions are **compulsory**.
2. Write structures wherever necessary.

Q. 1 Answer the following. Question 1 – 13 carry one mark each and question 14 carries 2 marks. **15**

1. Proteins can be 'drug targets' as well as 'drugs'. Give suitable examples.
2 Give two examples of functional groups that can act as hydrogen bond acceptors.
3. Give the reaction catalysed by the enzyme acetyl transferase using a drug of your choice.
4. Give an example of a kinase receptor.
5. If in the presence of an inhibitor, Km increases, identify the type of enzyme-inhibition.
6. Name a microbial enzyme and it's inhibitor.
7. Explain the term "monoclonal antibody".
8. List the types of secondary structures of proteins.
9. Explain the term 'post-translational modification'.
10 Explain 'antisense therapy' with a suitable example.
11. Give any two functional groups that undergo phase – II metabolism.
12. Enlist the forces that stabilize the double helix structure of DNA.
13. Discuss the importance of SAR studies.
14. "Conformational stability permits multiple biological effects" – explain using suitable example.

Q. 2 (a) Enlist any four intermolecular forces and elaborate on covalent bonding interactions. **04**

(b) Give the scheme of synthesis of cloxacillin with reagents and reaction conditions. **03**

(c) i. Write a note on "proteomics" **02**

ii. Give mechanism of action of sulphonamides **02**

Q. 3 A) Explain the following by giving a suitable example. **04**

i) Signal transduction.

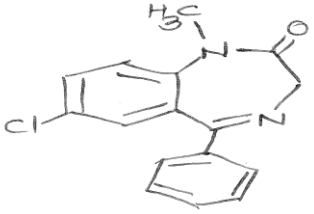
ii) Ion channel receptors

B) Classify "Quinoline-Based" Antimalarial agents giving one chemical structure for each class. **03**

C) i. Write synthesis of "ciprofloxacin" by giving all conditions and reagents. **03**

ii. Define 'Affinity' **01**

Q. 4 A) i. Predict any two phase – I metabolites for the given molecule **02**



ii. Discuss any two Phase – I metabolic pathways for carbonyl compounds. **02**

B) Based on SAR predict the effect of the following changes on the activity. **03**
   i. Introduction of an isoxazole group at the α– carbon of the acyl side chain in penicillins.
   ii. Epimerization at position 5a in tetracyclines
   iii. Introduction of an alkoximino group in the acyl side chain of cephalosporins.

C) i. Highlight the importance of pka in design of sulfonamides. **02**
   ii. Give an example (with structure) of a drug used in leishmaniasis **02**

Q. 5 A) Classify the following cephalosporins based on generation and also state the route of administration, cefadroxil, cefoxitin, cefotaxime. **03**

B) i. Give mechanism of action of INH. **02**
   ii. Give structure of any one second line drug used in treatment of tuberculosis **01**

C) Outline the synthesis of chloroquine OR sulfadiazine along with reagents and reaction conditions. **03**

D) Give the structure and use of Diloxanide furoate **02**

Q. 6 A) Write a short note on Polyene antibiotics as Antifungal agents **04**

B) Write a synthesis scheme for any one drug mentioning reaction conditions and reagents for Dapsone **OR** Clotrimazole. **03**

C) i. Give the structure and write the name of (any two) **02**
   a) Degradation of penicillin in presence of β - lactamase
   b) An anthelmintic drug
   c) Oxazolidinone class of antibiotics.
   ii. Give the rationale for combination therapy of tuberculosis and give one example **02**
