[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. Name a viral enzyme and it's inhibitor
2 List the forces that stabilize the tertiary structure of a protein.
3. Give one example of post-translational modification of protein.
4. If in the presence of inhibitor, both Km and Vmax decrease, identify the type of enzyme-inhibition.
5. How are Van der Waals interactions different from typical dipole-dipole interactions?
6. Give an example of a functional group that can act both as hydrogen bond donor and hydrogen bond acceptor.
7. Give an example of a ligand-gated ion channel receptor.
8. The DNA backbone is made up of ……. Bonds.
9. Name a Phase – II reaction that leads to the formation of mercapturic acid derivatives.
10 Name a class of drugs that form a covalent bond with DNA. Give an example.
11. Give an example of "Hydrolysis" as a biotransformation pathway.
12. "SAR- a tool for drug development". Comment.
13. Protein binding can prolong the drug's duration of action. Explain.
14. Nucleic acids can be "drug targets" as well as "drugs". Give suitable examples.

Q. 2 **A)** Enlist any four intermolecular forces and elaborate on Van der Waals interaction. **04**

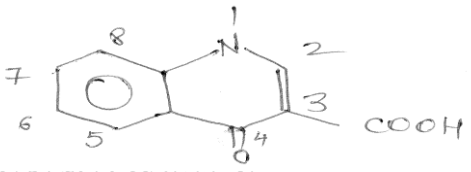
B) With respect to SAR of penicillin, state whether the following statements are True or False, correct if false. **03**

i. Introduction of electron releasing group at α-carbon increases the acid stability.
ii. Increasing steric hindrance at α −carbon decreases the β − lactamase stability.
iii. Introduction of a polar group at α −carbon broadens the spectrum of activity

C) i. Proteins can be drugs as well as drug targets. Explain. **02**
ii. Give the structure and generic name of a sulphonamide used for ulcerative colitis. **02**

Q. 3 **A)** Enlist different types of receptors and discuss "Kinase-receptors". **04**

B) i) Comment on the effect of the following changes on the core nucleus drawn below:- **02**

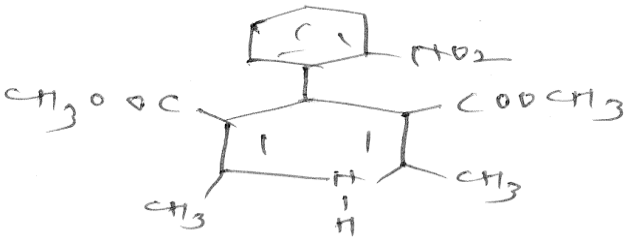


a) Introduction of a cyclopropyl group at position -1.
b) Introduction of a fluoro– moiety at position – 8.

B) ii) Explain the term 'Tolerance'. **01**

C) Discuss SAR features of Cinchona Alkaloids as Antimalarial Agents. **04**

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



ii. Name any four oxidative metabolic reactions. **02**

B) Outline the synthesis for cloxacillin. **03**

OR

B) Give the structure and generic name for **(any three)** of the following **03**

i. A β – lactamase inhibitor
ii. A Monobactam
iii. A parenteral cephamycin
iv. Degradation product of tetracycline

C) i. Briefly discuss "Bioisosterism" with suitable example **02**

ii. Deduce the structure for "5 – amino 1 - cyclopropyl -7 -(3, 5 – dimethyl- 1 – piperazinyl) 6,8 – difluoro 1,4 – dihydro – 4 - oxo quinoline -3- carboxylic acid **01**

iii. Write the structure for a drug used in the treatment of trypanosomiasis. **01**

Q. 5 **A)** Enlist the structural features of macrolide antibiotics and add a note on mechanism of action. **03**

B) Outline the synthesis of Ethambutol **OR** PAS along with reagents and reaction conditions. **03**

C) Explain the chemical features of artemisinin derivatives. Give structure of one hydrophilic and one lipophilic derivative. **03**

D) Give the structure and use of Tinidazole. **02**

Q. 6 **A)** Write a short note on Allylamine class of Antifungal agents. **04**

B) Outline the synthesis by giving reaction conditions and reagents for synthesis of Dapsone **OR** ciprofloxacin. **03**

C) i. Sulfamethoxazole and Pyrimethamine is a combination used in treatment of Malaria. Justify. **02**

C) ii. Name the Enzymes inhibited by **02**

a) Miconazole
b) Norfloxacin
