

(3 Hours)

[ Total Marks : 70

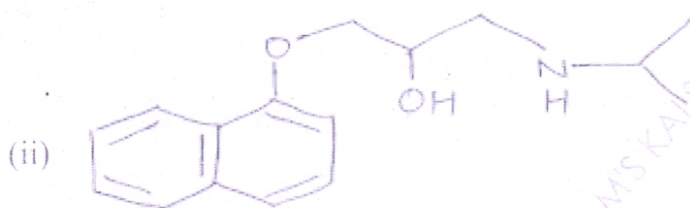
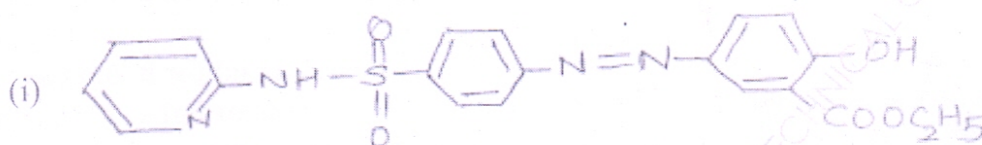
- N.B. :** (1) All questions are compulsory  
(2) Write structures wherever required.

1. Answer the following. Question 1-11 carry **one** mark each and questions 12 - 13 carry **2** marks. 15
- (1) Give an example of a drug that targets a lipid.
  - (2) Which is the strongest amongst all the intermolecular forces ?
  - (3) What are the characteristics of a peptide linkage ?
  - (4) Give an example of post-translational modification of a protein involving proteolytic processing.
  - (5) Give an example of a protein or peptide approved for human use.
  - (6) In uncompetitive inhibition  $K_m$  increases, True or False. Correct if false.
  - (7) Give an eg. of a drug that is antiviral due to inhibition of a viral enzyme, also name the enzyme.
  - (8) Give an example of a nuclear receptor.
  - (9) Supercoiled DNA is an example of DNA tertiary structure. True or False, correct if false.
  - (10) Give an example of a DNA intercalating agent along with its therapeutic use.
  - (11) Weakly basic drugs mainly exist in the unionized form in the stomach. True or False, correct if false.
  - (12) Enlist any four Phase -II metabolic reactions.
  - (13) List the parameters that can be used to quantify steric factor in QSAR. Explain any one.
2. (a) Enlist any four intermolecular forces and give one example for each. 4
- (b) Draw the chemical structure for the following (**any three**) 3
- (i) A Carbapenam
  - (ii) An extended spectrum penicillin
  - (iii) Fourth generation cephalosporin
  - (iv) Prodrug of tetracycline
- (c) (i) Justify the statement "Functional diversity of proteins" 2
- (ii) Classify sulfonamides on the basis of duration of action and give one example from each class (give chemical structure) 2

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3. (a) Explain the following terms and give one example for :- 4  
 (i) Signal transduction (ii) GPCR  
 (b) Outline the synthetic route and give necessary reagents and reaction conditions for chloroquine OR Metronidazole 3  
 (c) (i) Define - (a) Agonist (b) Affinity 2  
 (ii) Give the name and chemical structure for the fluoroquinolone with least incidence of phototoxicity. Justify. 2

4. (a) Predict atleast two phase-I metabolites for each of the following : 4



- (b) Outline the synthesis of cloxacillin along with reagents and reaction conditions. 3  
 (c) Answer in brief.

- (i) With suitable example explain 'Bioisosterism'. 2

OR

- (i) With a suitable example explain the influence of geometric isomerism on biological activity. 1  
 (ii) Give the structure and generic name for 1-Ethyl-6-fluoro-1, 4-dihydro-4-oxo-7-(1-piperazinyl) - 3 - quinoline carboxylic acid. 1  
 (iii) Justify "Co-trimoxazole is an example of synergism". 1

5. (a) State whether the following statements are true or false; justify the same and correct if false. 3

- (i) Ampicillin is an acid-stable penicillin.  
 (ii) The presence of a good leaving group on the 3-position in cephalosporins is important for high acid stability.  
 (iii) The  $\beta$ -stereo orientation of the C-4 dimethylamino moiety of tetracyclines is essential for bioactivity.

- (b) Outline the synthesis with necessary reagents and reaction conditions for Dapsone. 3

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- (c) Answer the following : 3
- (i) C-9 epimers of quinine are inactive. Justify.
  - (ii) Give the generic name and structure of a polycyclic antimalarial.
  - (iii) Name two derivatives of artemisinin.
- (d) Give the structure and generic name for
- (i) 1-(2-Methyl-5-nitro-1 H - imidazol - 1 -yl) propan-2-ol
  - (ii) N, N-Diethyl-4-methylpiperazine-1-carboxamide
6. (a) Write a note on Allylamine antifungal agents 3
- (b) (i) Write the mechanism of action for (any two) 2
- (a) Ethionamide
  - (b) Fluconazole
  - (c) Streptomycin
- (ii) Enlist the structural features of polyene antifungal antibiotics and give two examples. 2
- (c) Answer the following (any two) 4
- (i) Structural features of macrolide antibiotics
  - (ii) Give the structure and use of Aztreonam
  - (iii) Classify various descriptors used in QSAR, giving one example from each class.
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