Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Pharm(New)/SEM-5/PT-503/2011-12

2011

PHARMACEUTICAL CHEMISTRY (MEDICINAL)

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

   i) The antihistaminic drug with no heteroaryl ring system in its structure is

   a) Doxylamine b) Triprolidine

   c) Medrylamine d) Meclizine.

ii) Benzhydryl bromide when treated with 2-dimethyl aminoethanol in presence of K_2CO_3 gives which one of the following ?

a) 2-diphenyl ethoxy-N, N-dimethyl ethylamine

b) 2-diphenyl methoxy-N, N-diethyl ethylamine

c) 2-diphenyl methoxy-N, N-dimethyl ethylamine

d) 2-diphenyl methoxy-N, N-diethyl methylamine.

iii) The carboxyl group of aspirin is esterified with N-acetyl-*p*-aminophenyl to get

a) 3-Acetamidophenyl-*o*-acetyl salicylate

b) 4-acetamidophenyl-*o*-acetyl salicylate

c) *O*-2 (2-hydroxy benzoyl) salicylic acid

d) 3-acetamidophenyl-*o*-acetyl salicylate.

iv) Salbutamol is synthesized starting from

a) phenyl acetonitrile

b) methyl salicylate

c) 4-hydroxy propiophenone

d) mesitylene derivative.

v) IUPAC system of nomenclature for diclophenac sodium (BP) is

a) Sodium 2-[2, 6-Dichlorophenyl amino] phenyl acetate.

b) Sodium 3-[2, 6-Dichlorophenyl amino] phenyl acetate.

c) Sodium 2-[2-Chlorophenyl amino] phenyl acetate.

d) Sodium 2-[6-Chlorophenyl amino] phenyl acetate.

vi) Which is the heterocyclic moiety present in the structure of Pralidoxime which contains the quaternary ammonium nitrogen, responsible for binding with the anionic site of the cholinesterase enzyme ?

a) Pyrrole b) Pyrimidine

c) Oxazole d) Pyridine.

vii) Nitrogen isosteres of salicylates are

a) *p*-amino phenol derivatives

b) Anthranilic acid derivatives

c) Aryl alkanoic acid derivatives

d) Pyrazolidinedione derivatives.

viii) If the chain length of ethylene bridge of cholinomimetics is increased, activity will be

a) abolished b) same

c) increased d) decreased.

ix) Which one of the following has a bicyclic nucleus in its structure ?

a) Clidinium bromide b) Pyridostigmine

c) Echothiophate iodide d) Tropicamide.

x) A highly reactive metabolite of paracetamol which is responsible for liver necrosis in a very large dose saturating the glucuronidation capacity is

a) N-acetyl-*p*-benzoquinoneimine

b) N-propyl-*p*-benzoquinoneimine

c) N-methyl-*p*-benzoquinoneimine

d) N-aryl-*p*-benzoquinoneimine.

xi) Which of the following is the strongest bond between drug and receptor ?

a) Ionic bonding

b) Hydrogen bonding

c) Covalent bonding

d) van der Waals bonding.

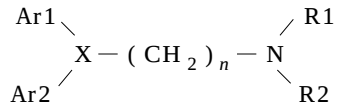
xii) 2-(*p*-Isobutyl phenyl) propionic acid is

a) Diclofenac b) Naproxen

c) Indomethacin d) Ibuprofen.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. The structure  is common to most of antihistamines. Comment on the possible variations with respect to Ar1, Ar2, X, R1, R2 and their effect on antihistaminic activity.

3. Write the synthesis of ibuprofen.

4. a) Write down the names of the heterocycles present in :

   i) Analgin ii) Rofecoxib iii) Celecoxib.

   b) Name one oxicam derivative having anti-inflammatory activity.

   c) 'NSAIDs can produce gastrointestinal damage'. Why ?

5. Write a note on proton pump inhibitors.

6. What are isostere and bioisostere ? Explain with various examples and cite their significance.

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) Explain briefly the main objective of QSAR study.

   b) What is the hypothesis of Free-Wilson analysis ?

c) Discuss the application of QSAR in medicinal chemistry.

d) Write a brief note on Computer-aided Drug Designing.

e) Point out the difference between 2D and 3D QSAR. 3 + 3 + 3 + 4 + 2

8. Define cholinomimetics. Write SAR of cholinergic agonists. Explain briefly about nerve gases and its antidotes. Write a note on antispasmodics. Write the synthetic protocol of dicyclomine. 1 + 6 + 3 + 3 + 2

9. a) Write down the synthesis of any *two* :

i) Aspirin ii) Mefenamic acid iii) Paracetamol.

b) Discuss the structure-activity relationship of Pyrazolidinedione with suitable examples.

c) Give examples of selective COX2 inhibitors. Discuss the advantages of selective COX2 inhibitors over non-selective NSAIDs. Is there any limitation for the use of selective COX2 inhibitors ? (3 × 2) + 6 + 3

10. Define and classify synapathomimetic drugs. Explain briefly the SAR of phenyl ethanol amine class of adrenergic agonists. Write down the therapeutic uses of sympatholytics. Show how propanolol is synthesized using starting material α-naphthol. 4 + 6 + 2 + 3

11. a) Write down the metabolic pathways of histamine.

b) Write down how the H_1 antagonists inhibit the histamine release from the mast cells with structure.

c) Write down the synthetic precedure of any *two* of the following drugs with starting material names :

i) Chlorpheneramine

ii) Meclizine

iii) Promethazine. 5 + 5 + 5