Sem V (2021-22)

P.P Code-10640

Time: 3 hours **Total marks:75**

N.B. : 1. All questions are compulsory
2. Figures to right indicate full marks

I. Choose appropriate option for following multiple choice based questions. **20**

1 The piperazine nucleus is present in all of the following drugs except
   a. Cetirizine
   b. Chlorocyclizine
   c. Meclizine
   d. Phenindamine

2 The gauche conformer of histamine has a preferred affinity for _____ receptor/s
   a. H1
   b. H2
   c. H3
   d. H1 and H2

3 The active intermediate of proton pump inhibitors that is responsible for inhibiting the H+/K+ ATPase pump is
   a. Sulphonamide
   b. Sulphonyl
   c. Sulphacetamide
   d. Sulfenamide

4 Anticancer drug metabolized by Xanthine Oxidase is _____
   a. Allopurinol
   b. Methotrexate
   c. Vincristine
   d. 6-Mercaptopurine

5 Identify the correct pair from the following.
   a. Thiotepa: Mesna
   b. Busulfan: Aziridinium ion
   c. Chlorambucil: L-isomer
   d. 5-Flurouracil: False substrate

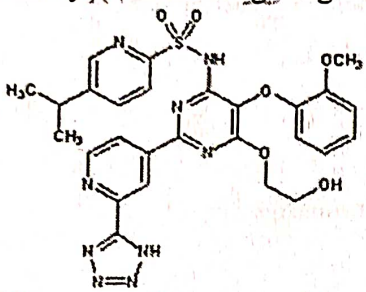
6 Choose the correct non-dihydropyridine calcium channel blocker
   a. Nifedipine
   b. Felodipine
   c. Bepridil
   d. Nicardipine

7 Chlorthiazide inhibits
   a. Carbonic anhydrase
   b. $Na^+/K^+/2Cl^-$ cotransporter
   c. Na^+/Cl^- symporter
   d. Ca^{+2} transporter

8 Isoquinoline ring is present in _____
a. Enalapril
b. Captopril
c. Lisinopril
d. Quinapril

9 Amyl nitrite is an ester of _____ & _____
a. Amyl alcohol & nitrous acid
b. Isoamyl alcohol & nitrous acid
c. Amyl alcohol & nitric acid
d. Isoamyl alcohol & nitric acid

10 Identify the following drug



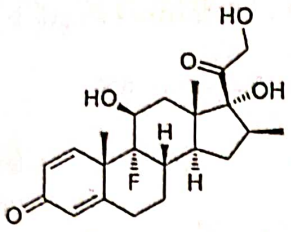
a. Nesiritide
b. Tozesentan
c. Bosentan
d. Disopyramide

11 Select the incorrect statement. Sotalol acts by _____.
a. Potassium channel blockage
b. Increasing repolarization phase
c. Shortening repolarization phase
d. Inhibition of β stimulation

12 Clopidogrel acts by
a. Inhibiting platelet aggregation
b. Antagonizes Vitamin K
c. Inhibits carboxylation of precursor protein
d. Stimulating coagulation

13 Antihyperlipoproteinemics like statins mimic -----.
a. Mevalonic acid
b. Tetrahedral intermediate in Mevalonic acid pathway
c. HMG CoA
d. Mevastatin

14 Identify the drug



a. Dexamethasone
b. Prednisolone
c. Betamethasone
d. Hydrocortisone

15 Hydrocortisone is a reduced form of cortisone. Reduction takes place at _____.

a. 3-one
b. 11-one
c. Double bond between C3 and C4
d. 20-one

16 To which chemical class does Tolbutamide belong to

a. Sulphonyl ureas
b. Meglitinides
c. Thiazolidinediones
d. Biguanides

17 The starting material for the synthesis of Benzocaine

a. p- amino benzoic acid
b. p- amino benzoate
c. m-nitro benzoic acid
d. o-nitro benzoic acid

18 Sildenafil contains _____ ring.

a. Pyrazolopyridoindole
b. Pyrazolopyrimidine
c. Pyrazinopyridine
d. Imidazoindole

19 Synthetic thyroxine is available in _____ form.

a. Levo
b. dextro
c. meso
d. racemic

20 The primary mechanism of action of local anasthetic is

a. Activation of ligand-gated potassium channels
b. Blockade of voltage-gated sodium channels
c. Stimulation of voltage-gated N-type calcium channels
d. Blockade the GABA-gated chloride channels

II. Long Answer Questions (Answer any 2 out of 3) 20

Q1 A) Indicate the mechanistic class of cyclophosphamide. Illustrate the chemistry behind its mechanism of action and depict its activation pathway in detail. 4

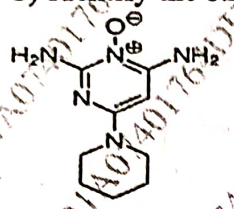
B) Outline the mechanism of action of Doxorubicin and Vincristine. (structure not required) 4

C) 5-Fluorouracil is a prodrug. State true or false. Justify 2

Q2 A) Discuss rationale development of ACE inhibitor containing thiol group. 4

B) Outline the synthesis of furosemide mentioning the reagents, intermediates and the reaction conditions. 4

C) Identify the structure given below & depict its bioactivation. 2



Q3 A) Classify local anaesthetic chemically with one structure of each class and describe its mechanism of action. 4

B) Discuss 4 structural modifications in corticosteroids to enhance glucocorticoid activity. Support your answer with relevant structures. 4

C) Give an example of hypoglycemic containing sugar moiety. Name the mechanistic class to which it belongs. 2

III. Short Answer Questions (Answer 7 out of 9) 35

Q1 Write target enzyme of Pantoprazole and highlight the advantage of proton pump inhibitors over other drugs used in hyperacidity. Depict the activation of Pantoprazole. 5

Q2 i) Match the following: 3

	Name		Nucleus		Mechanistic class
1	Diltiazem	a	Steroid Lactones	i	Calcium channel blocker
2	Spironolactone	b	Benzothiazepine derivative	ii	Carbonic anhydrase inhibitor
3	Dichlorphenamide	c	1,3-disulfonamide derivative	iii	Aldosterone antagonist

ii) Give schematic representation of binding interactions between ACE inhibitors/substrate and angiotensin converting enzyme 2

Q3 Explain mode by which the following drugs exert their action. Mention the clinical condition in which they are used. 5

a. Nesiritide

b. Menadione

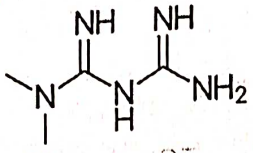
Q4 Draw the structure of estradiol and give its IUPAC nomenclature. What is the effect of the following: 5

i) Addition of hydroxyl group at 6,7 and 11 position

ii) Substitution of 17α position with ethynyl group

iii) Removal of -OH group at C3

Q5 Answer the following questions with resepect to given structure. 5



i) Identify the drug.
ii) Which class this drug belongs to?
iii) Comment on mechanism of action of the drug
iv) Write its therapeutic use
v) Write the prominent adverse effect.

Q6 Classify antiarrhythmic drugs based on mechanism of action. Give one example and structure of each class. 5

Q7 Outline the synthesis of Tolbutamide with reaction conditions and necessary reagents and write its mechanism of action and use. 5

Q8 i) Outline synthesis of Warfarin mentioning the reagents and reaction conditions. 3
ii) Outline the mechanism of fibrates and give an example and structure of drug belonging to this class. 2

Q9 i) What is the advantage of 2nd generation H1 antagonist over 1st generation. Which structural characteristics contribute to these advantages. Draw the structure of any one 2nd generation H1 antagonist. 3
ii) Why o,o-dichloro substitution is necessary in clonidine? Justify. 2