T.Y.B.Bharm
Sem-V
ATKT

Duration: 3 hours **Total marks: 75**

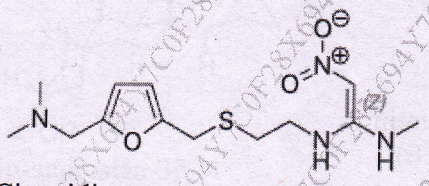
10/03/2025

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

Q. 1 Choose appropriate option for following multiple choice-based questions. 20 Marks

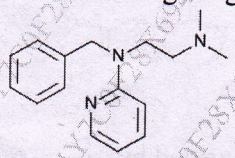
1 The proton pump is also known as
a $Na^+ - K^+$ ATPase
b $Na^+ - H^+$ ATPase
c $H^+ - K^+$ ATPase
d $K^+ - Na^+$ ATPase

2 Identify the following drug:



a Cimetidine
b Famotidine
c Nizatidine
d Ranitidine

3 The following drug belongs to the _____ class of antihistamines



a Ethanolamine ethers
b Ethylenediamines
c Dibenzo cycloheptenes
d Piperazines

4 Bleomycin acts as antineoplastic by
a DNA intercalation
b Generation of reactive oxygen species
c Topoisomerase I poisoning
d Mitosis inhibitor

5 Ring system present in Methotrexate is
a Pteridine
b Purine
c Pyrimidine
d Imidazole

6 Dichlorphenamide inhibits
a Ca^{+2} transporter
b Carbonic anhydrase
c Na^{+}/Cl^{-} Symporter
d $Na^{+}/K^{+}/2Cl^{-}$ cotransporter

7 Which of the following statement of Lisinopril is false
a It is a dicarboxylate containing ACE inhibitor.
b It is given as a prodrug
c It exists in zwitterionic form
d Lisinopril is excreted unchanged

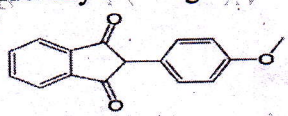
8 Which of the following drug belongs to the chemical class 1,4-dihydropyridine AA
a Verapamil
b Bepridil
c Dipyridamole
d Felodipine

9 Name the enzyme inhibited by lovastatin
a Angiotensin converting enzyme (ACE)
b HMG CoA reductase
c Renin
d Phosphodiesterase 5(PDE5)

10 To which chemical class does verapamil belong to
a Benzothiadiazines
b Benzothiazepine
c Phenyl alkyl amine
d 1,4- dihydro pyridine

11 Quinoline and quinuclidine rings in quinidine are connected by
a Hydroxymethylene bridge
b Hydroxyethylene bridge
c Ethylene bridge
d Methylene bridge

12 Identify the drug

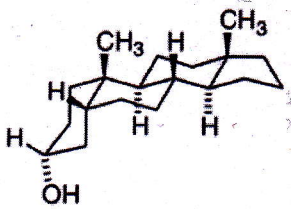


a Clopidogrel
b Anisindione
c Menadione
d Acetomenadione

13 Recombinant Natriuretic peptide used in congestive heart failure
a Digitalis
b Warfarin
c Nesiritide
d Bosentan

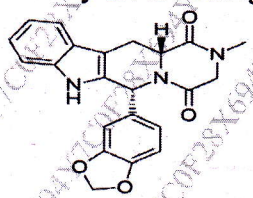
14 The structure of Methimazole shows the presence of ---------- ring
a Imidazole
b Indole
c Triazole
d thiazole

15 Choose the correct nomenclature for



a 5α-androstan-3β-ol
b 3-Hydroxy-5β-androstane
c 5β-androstan-3α-ol
d 3β-Hydroxyandrostane

16 Identify the following drug



a Tadalafil
b Sildenafil
c Mifepristone
d Diethylstilbestrol

17 Norgestrel is a
a Progesterone agonist
b Estrogen agonist
c Progesterone antagonist
d Estrogen antagonist

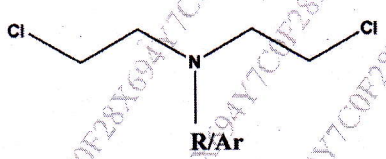
18 Which of the following drug pair is known as insulin sensitizer but belongs to different scaffold?
a Metformin-Repaglinide
b Rosiglitazone-Repaglinide
c Metformin-Rosiglitazone
d Tolbutamide-Metformin

19 Glargine Insulin is ----------insulin analogue.
a Short acting
b Long acting
c Intermediate acting
d ultra short acting

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

I. Long Answers (Answer any 2 out of 3) **20 Mar**

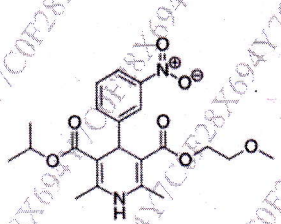
Q1 A. Answer the following based on the structure given below **6 mark**



i. Identify the class of anticancer agent and outline the schematic mechanism of action.
ii. Name the drug when R - phenyl butanoic acid.
iii. Comment on the significance of substituent on nucleophilicity and selectivity of this class of drug.

B. Give the structure of 6-mercaptopurine. Name the mechanistic class to which it belongs and write the detailed mechanism of action. **4 mar**

Q2 A. Answer the following with respect to the given structure. **4 Ma**



i. Identify this structure and give its therapeutic use.

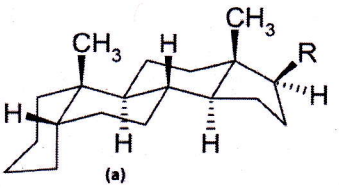
ii. Give mechanistic class and generation.

iii. 3 and 5 positions of the structure are not equivalent State true or false and justify

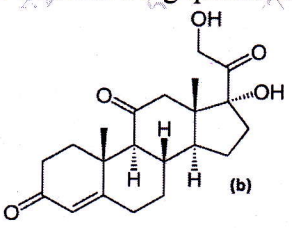
B. Discuss structural features of cardiac glycosides with respect to glycon, aglycon, and stereochemistry. Name two prominently used cardiac glycosides **4 M**

C. Mention the mechanistic class of spironolactone and give its metabolism **2 M**

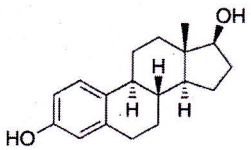
Q3 A. Based on the structures below answer the following questions: **4 Marks**



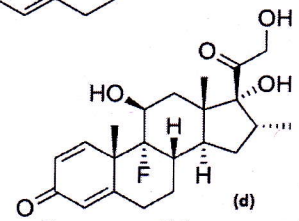
(a)



(b)



(c)



(d)

i. Write the stereochemistry of the A/B, B/C and C/D ring fusions in (a)
ii. Name the enzyme involved in converting (b) to hydrocortisone
iii. Name and structure of non-steroidal analog of (c)
iv. Name the epimer of (d)

B. Discuss the SAR of sulfonylureas. Using suitable examples bring out the differences in the structural features between the first and second-generation sulfonylureas. (Support your answer with relevant structures) **4 Marks**

C. Explain in brief drugs used in the treatment of hypothyroidism. **2 Marks**

II. Short Answers (Answer 7 out of 9) **35 Marks**

Q1 What is the general structural framework of first generation H_1 antihistamines. List 4 structural classes derived from the general structural framework giving one example (with structure) from each class. **5 Marks**

Q2 A. Match the following : **3 Marks**

	Name		Nucleus		Mechanistic Class
1	Bepridil	a	Pteridine		Potassium sparing diuretic
2	Triamterene	b	Phenoxyacetic acid derivative		High ceiling diuretic
3	Ethacrynic acid	c	Phenylalkylamine derivative		Calcium Channel Blocker

B. Write synthesis of nitroglycerine mentioning the reagents & reaction conditions **2 Marks**

Q3 Classify antiarrhythmic drugs based on mechanism of action. Give one structure with examples from each class. **5 Marks**

Q4 A. Write the structure of the following: **3 Marks**

i. Androst-4-ene-3,17-dione

ii. 9α,11β-Dihydroxy-5β-Cholestan-3-one

iii. Mifepristone **2 Marks**

B. Give one structural change made to testosterone to

i.Confer oral activity

ii. to increase anabolic activity

Q5 Classify local anaesthetic and give one example and structure from each class. **5 Marks**
Explain the effect of substitution on the lipophilic portion on activity

Q6 Elaborate mechanism of action and chemistry of Colestipol **5 Marks**

Q7 A. Predict the effect of the following structural changes on activity **3 Marks**

i. Introduction of a double bond between positions 1 and 2 in cortisone

ii. Introduction of a $-CH_3$ group at the 17α position in testosterone

iii. Introduction of 17α-ethynyl group in estradiol

B. Explain how acarbose acts as antidiabetic agent **2 Marks**

Q8 A. Outline the synthesis of Disopyramide mentioning the reagents & reaction conditions. **3 Marks**

B. Write the structure of the active form of Omeprazole and name the enzyme inhibited. **2 Marks**

Q9 A. Write synthesis of Furosemide mentioning the reagents & reaction conditions. **3 Marks**

B. Enalapril is a prodrug.State true or false. Justify. **2Marks**
