T. Y. B. Pharm
Semester Exam
Sem - V
30/11/24

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

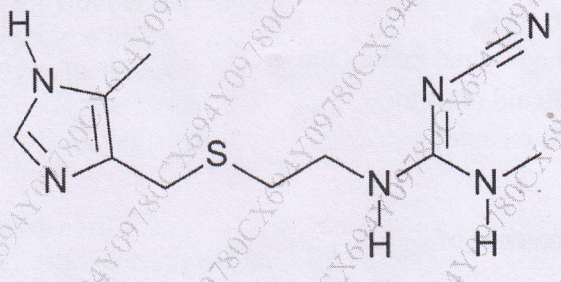
N.B. : 1. All questions are compulsory
2. Figures to right indicate full marks

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

1 Omeprazole is metabolised to the _____ intermediate that binds to H^{+}-K^{+} ATPase

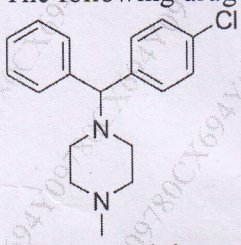
a Sulfonamide
b Sulfone
c Sulfide
d Sulfenamide

2 Identify the following drug:



a Cimetidine
b Famotidine
c Nizatidine
d Ranitidine

3 The following drug belongs to the _____ class of antihistamines



a Dibenzocycloheptene
b Ethylenediamine
c Piperazine
d Phenothiazine

4 Which of the following are structural components of dactinomycin?

a Phenoxazine ring and pentapeptide lactone
b Anthracenedione
c Glycoside
d Triterpenoid

5 Select the non-nitrogen alkylator from the following.
a Chlorambucil
b Melphalan
c Mechlorethamine
d Busulfan

6 Which of the following ACE inhibitor shows skin rash and taste disturbances as side effects
a Captopril
b Benazepril
c Lisinopril
d Enalapril

7 Spironolactone diuretic acts by
a Antagonism of aldosterone
b Plugging Na^+ channel in the luminal membrane
c Activation of mineralocorticoid receptor
d Inhibition of glucocorticoid receptor

8 Guanethidine shows the presence of
a Azocine & guanidine
b Benzine & guanidine
c Azepine & guanidine
d Azocine & 1,2,4-benzothiazine

9 A nitrate vasodilator causes
a Inhibition of soluble guanylate cyclase
b Activation of soluble guanylate cyclase
c Activation of myosin light chain kinase
d Inhibition of cGMP-dependent protein kinases

10 Indicate the antiarrhythmic class of Disopyramide
a I
b II
c III
d IV

11 Clofibrate prominently reduces _____.
a Plasma triglycerides
b LDL
c Blood glucose
d HDL

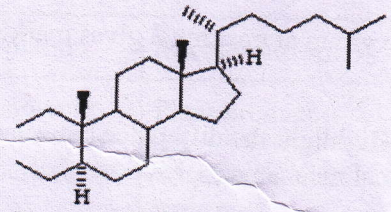
12 Which of the following drug acts as PY2 receptor antagonist
a Warfarin
b Clopidogrel
c Anisindione
d Menadione

13 Steroidal ring in cardiac glycosides has _____ring fusion.
a Cis-trans-trans
b Cis-cis-cis
c Cis-trans-cis
d Trans-trans-trans

14 Propylthiouracil is a
a Pyridinethione
b Pyrazinethione
c Pyridazinethione
d Pyrimidinethione

15 Sildenafil is a
a Phosphodiesterase type 5 inhibitor
b Phosphodiesterase type 2 inhibitor
c Phosphodiesterase type 1 inhibitor
d Phosphodiesterase type 3 inhibitor

16 Choose the correct nomenclature for:



a 2,3-Seco-5β-Cholestane
b 1,2-Seco-5α-Cholestane
c 1,2-Seco-5β-Cholestane
d 2,3-Seco-5α-Cholestane

17 Diethylstilbestrol is
a Non-steroidal antiestrogen
b Non-steroidal estrogen
c Steroidal estrogen
d Progesterone antagonist

18 Sulfonylurea class of drugs are ---------- in nature.
a Weak acid
b Acids
c Neutral
d Base

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

20 Tetracaine belongs to the class of _____ derivatives
a Benzoic acid
b Amino benzoic acid
c Anilide miscellaneous class
d Miscellaneous class

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

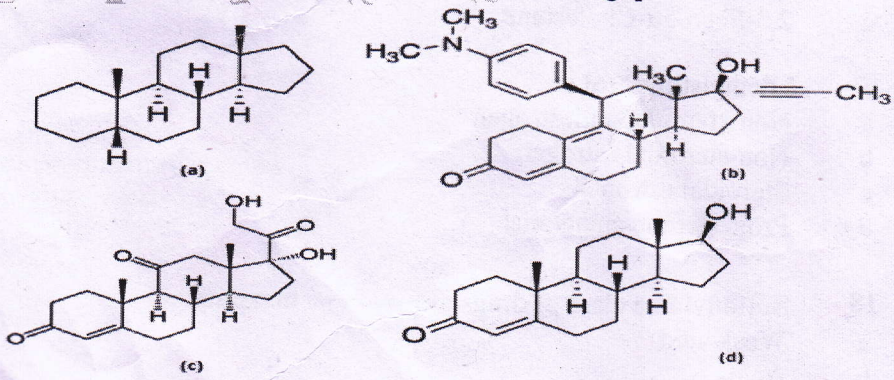
Q1
A. Explain the role of proton pump inhibitors in managing hyperacidity conditions. Depict the activation of Omeprazole.
B. Discuss the rational development of Cimetidine from Histamine. Elaborate the change in activity observed subsequent to each structural change.
C. Name a 1st generation and 2nd generation H_1 antihistaminic agent. List the advantages of the second generation H_1 antihistamines

Q2
A. With regards to the SAR of thiazide diuretics, state which statement is true/ false. Correct if they are false.
i. An electron releasing group is necessary at the 6th position
ii. Removal of the sulfonamide group at position 7 gives little or no diuretic activity
iii. Saturation of the double bond at 3-4 position increases the diuretic action more than 10 fold
iv. Substitution with a lipophilic group at position 3 gives marked increase in diuretic potency.

B. Draw the structure of digoxin. Highlight the difference between digoxin and digitoxin. Explain its biochemical mechanism of action.

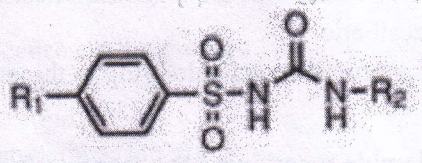
C. Explain the mechanism of action of HMG CoA reductase inhibitors.

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



i. Write the stereochemistry of the A/B, B/C and C/D ring fusions in (a)
ii. Give the generic name and mechanistic class of (b)
iii. In structure (c), what is the effect of reduction at position 11 on glucocorticoid activity
iv. Identify (d) and suggest a modification to prevent metabolism of 17-OH

B. With respect to the following structure, answer the questions given below - **4 Marks**



i. Identify the chemical class and mention its therapeutic use.
ii. Identify the most acidic proton in this structure and justify your answer.
iii. Indicate the functional group at R1 which will significantly increase the potency of the molecules.
iv. Give the impact on the activity when R2 is a small group such as methyl

C. Indicate the structural difference between Meglitinide and glimepiride and also explain how they bind to the same type of receptors. **2 Marks**

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

Q1 A. Match the following **3 Marks**

Name of drug	Origin/Source	Mechanistic class
Cisplatin	Microorganism	Mitosis inhibitor
Bleomycin	Plant product	Alkylating agent
Vincristine	Organometallic compound	Generation of Reactive oxygen species

B. Depict the activation of Mechlorethamine **2 Marks**

Q2 Discuss rationale development of ACE inhibitor captopril by citing examples with structures. **5 Marks**

Q3 Define & classify antiarrhythmic drugs based on mechanism of action. Give one example & structure of each class. **5 Marks**

Q4 A. Using suitable examples illustrate the 3 structural modifications made to testosterone to improve anabolic properties **3 Marks**

B. Write the structure of the following: **2 Marks**

i. Estra-1,3,5(10)-triene-3β,17β-diol
ii. 19-nor-5β-androst-1-en-3-one

Q5 Give mechanistic classification of hypoglycemic agents with one example from each class. Explain the mechanism of action of Pioglitazone. **5 M**

Q6 State the site of action, chemical class/ mechanistic class, and structure for the following drugs **5 M**

i) Isosorbide dinitrate ii) Ethacrynic acid iii) Diltiazem iv) Furosemide

Q7 Discuss the important structural features of local anaesthetics. Give the name and structure of any one local anaesthetic. **3 M**

b) Explain the mechanism of action of drugs belonging to thioamide class and give one example with structure **2 M**

Q8 a)Write synthesis of acetazolamide mentioning the reagents & reaction conditions. **3 M**

b) Give the structure of H1 antihistamine belonging to the following structural class: **2 M**

i. Aminoalkyl ether

ii. Phenothiazine

Q9 Write the synthesis of warfarin mentioning the reagents & reaction conditions. Explain its mechanism of action. **5 M**

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