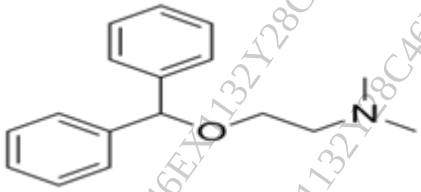
Duration: 3 Hours **Total marks: 75**

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 Identify the class to which the following drug belongs



a H_1 antagonist, ethanolamine derivative
b Second generation H1 antihistaminic
c H_2 receptor antagonist
d Proton pump inhibtor

2 What is the significance of the methyl group at 5th position of imidazole ring in cimetidine.
a It blocks metabolism at that region of the heterocyclic ring.
b It is an electron donating group which reduces the chance of ionization of imidazole ring.
c It is an electron withdrawing group which reduces the chance of ionization of imidazole ring.
d It is an electron donating group which favors the active tautomer.

3 Cromolyn sodium is a
a Leukotriene inhibitor
b Mast cell stabilizer
c Histamine agonist
d ATPase inhibitor

4 Select the anticancer drug that acts by free radical mechanism
a Vincristine
b Bleomycin
c Actinomycin C
d Doxorubicin

5 The bladder toxicity of cyclophosphamide is due to
a Mesna
b Acrolein
c Phosphoramide
d Phosphorus

6 Ethacrynic acid belongs to ---------- class of diuretic.
a Phenoxy acetic acid
b 5-sulfamoyl anthranilic acid
c Propionic acid
d Acetic acid

7 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

8 Choose the correct phenyl alkyl amine calcium channel blocker
a Nifedipine
b Amlodipine
c Verapamil
d Nicardipine

9 Minoxidil shows the presence of
a Phthalazine
b 1,2,4-benzothiazine
c N-oxide of a piperidinopyrimidine
d Indole nucleus

10 Which of the following class of antiarrhythmic drugs decrease action potential duration
a Class IA
b Class IB
c Class IC
d Class II

11 Which of the following structural features are present in quinidine
a Quinoline ring, quinuclidine ring and hydroxymethylene bridge
b Isoquinoline ring, decaline ring and methylene bridge
c Indole ring, quinuclidine ring and methylene bridge
d Benzofurane, decaline ring and hydroxymethylene bridge

12 Mechanism of action of Clopidogrel is
a Inhibition of Vitamin K reductase
b Inhibition of P_2Y_{12} receptor
c Inhibition of gamma carboxylation process
d Prothombin activation

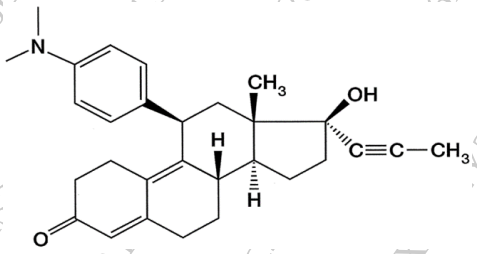
13 _____ are derivatives of 7-substituted-3,5-dihydroxyheptanoic acid
a Statins
b Thiazides
c Bile acid sequestrants
d Fibrates

14 The stereochemistry between rings A-B, B-C and C-D in 5ß-androstane is
a Cis-trans-trans
b Trans-trans-trans
c Cis-cis-trans
d Cis-cis-cis

15 The 9 ά-fluoro group in betamethasone
a Increases the glucocorticoid activity and decreases the mineralocorticoid activity
b Decreases the glucocorticoid activity and increases the mineralocorticoid activity
c Decreases the glucocorticoid activity and decreases the mineralocorticoid activity
d Increases the glucocorticoid activity and increases the mineralocorticoid activity

16 Propylthiouracil is used as
a Thyroid replacement therapy
b Natural thyroid
c Drug for treating hyperthyroidism
d Drug for treating goitre

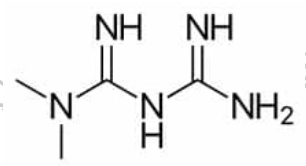
17 Identify the drug



a Testosterone, androgen
b Mifipristone, oral contraceptive
c Tadalafil, used for erectile dysfunction
d Estradiol, estrogen

18 Following statement is wrong about meglitinides,
a It is a non - sulphonylurea benzoic acid derivative
b It shust down ATP sesnsitive potassium channel
c It is an insulin secretogouge
d It is α glucosidase inhibitor

19 Identify the drug.



a Tolbutamide
b Metformin
c Glipizide
d Acarbose

20 Mepivacaine is
a Benzoic acid derivative
b Aminobenzoic acid derivative
c Anilide derivative
d Nitrobenzoic acid derivative

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

Q1 Answer the following **4 Marks**

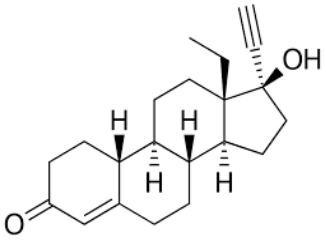
1. Illustrate chemical activation and mechanism of an antimetabolite acting as DNA polymerase inhibitor.
2. Name an organoplatinum anticancer agent. Comment on its geometry and draw its active form. Give the mechanistic class to which it belongs. **3 Marks**
3. Give the synthesis of mechlorethamine with reaction conditions and necessary reagents and write its use. **3 Marks**

Q2

1. Give the name and structure of an antihyperlipidemic that interferes with cholesterol synthesis. Name the enzyme inhibited by it. Depict its activation. **4 Marks**
2. With regards to the SAR of thiazide diuretics, state which statement is true/ false. Correct if they are false. **3Marks**
   a. An electron releasing group is necessary at the 6th position
   b. Removal of the sulphonamide group at position 7th gives little or no diuretic activity.
   c. Saturation of the double bond at 3,4-position increases the diuretic action more than 10 fold.
3. Give schematic representation of binding interactions between ACE inhibitors/substrate and angiotensin converting enzyme. **3 Marks**

Q3 1. Write the structure and IUPAC nomenclature of Testosterone indicate the stereochemistry of A/B and B/C and C/D ring fusion.Name two active metabolites of testosterone and the enzymes involved in their formation. **4 Marks**

2. Answer the following with respect to given structure. **3 Marks**



i. Identify the above structure.
ii. Write it's therapeutic use.
iii. Write it's mechanism of action.

3. Outline the synthesis of Tolbutamide with reaction conditions and necessary reagents and write its use. **3Marks**

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

Q1 Illustrate the activation pathway for Pantoprazole. Identify its target enzyme and the type of interaction. **5 Marks**

Q2 State the site of action, class (w.r.t-diuretics) and structure for the following drugs **5 Marks**
a.Triamterene b.Furosemide

Q3 Classify antiarrhythmic agents based on mechanism of action with example. Give one structure from each class. Discuss the difference between the subclasses of class I antiarrhythmics **5 Marks**

Q4 Give the general structure of corticosteroid. Give structural modifications in corticosteroids that increase glucocorticoidal activity. Support your answer with relevant examples. **5 Marks**

Q5 Discuss the structural features required for local anesthetic activity giving examples. **5 Marks**

Q6 Describe stereochemistry and structural features of cardiac glycosides. **5 Marks**

Q7 A. Match The following **3 Marks**

Class	Examples	Mechanism
1. Biguanides	a. Pioglitazone	i. Decrease gluconeogenesis
2. . Meglitinides	b. Metformin	ii. PPAR γ agonist
3. Thiazolidinediones	c. Repaglinide	iii. Insulin secretogogue

B. Depict metabolism of Lignocaine. Mention active, inactive and toxic metabolites. **2 Marks**

Q8	a.	Outline the synthesis of warfarin with reaction conditions and necessary reagents	**3 Marks**
	b.	Draw the structure of diphenhydramine.Mention its chemical class.	**2 Marks**
Q9	a.	Outline the synthesis of acetazolamide with reaction conditions and necessary reagents .	**3 Marks**
	b.	Draw the structure of a PDE3 inhibitor and mention its therapeutic use.	**2 Marks**

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