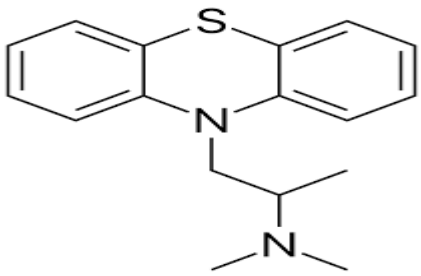
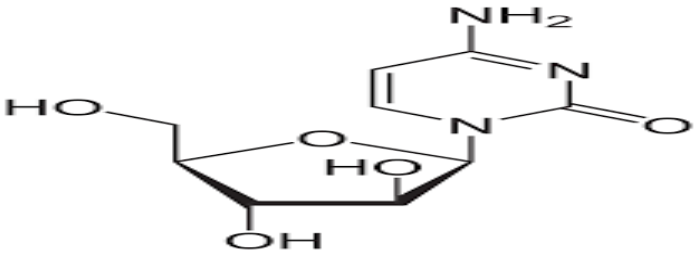
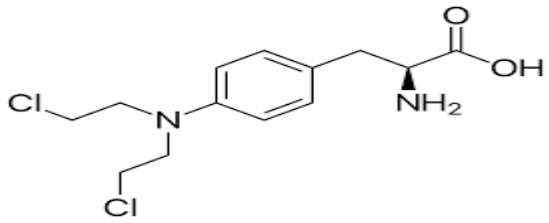
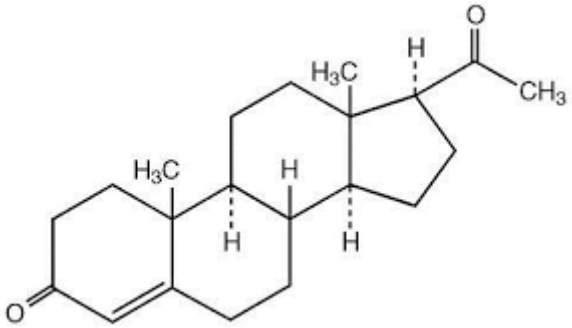
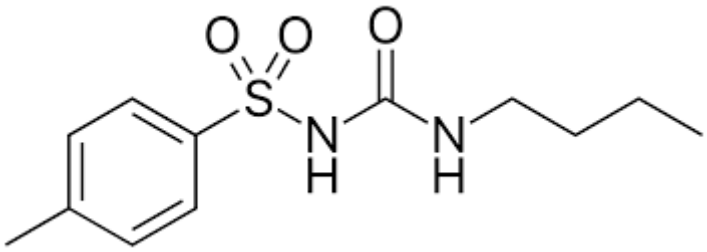
Q. 1	**Choose appropriate option for following multiple choice based questions.**	**20 mks**
1	H3 receptors are mostly found high density in	
a	**brain**	
b	respiratory system	
C	GIT system	
d	nerve cells	
2	H2 antihistaminic have following structural feature as	
a	indole	
b	**imidazole**	
C	ethylenediamine	
d	ethanolamine	
3	identify the following drug. 	
a	**promethazine**	
b	triprolidine	
C	azatidine	
d	buclizine	
4.	what is mode of action of ranitidine?	
a	**H+/K ATPase Proton pump inhibitor**	
b	H1 antagonist	

C	H2 antagonist	
d	topical antihistaminics	
5.	What is this drug's mode of action? 	
a	DNA methylating agent	
b	Intercalater	
C	Chain terminator	
d	**antimetabolites**	
6.	Identify structural feature in dactinomycine from the following	
a	oxazole	
b	ketone	
C	thiazole	
d	**phenoxazine**	

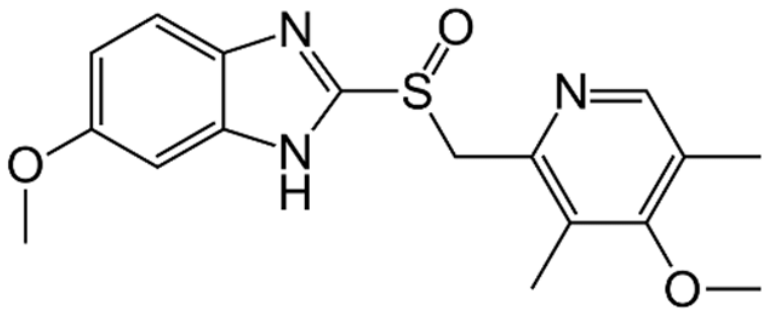
7.	Identify the following structure 	
a	Mechlorethamine	
b	busulfan	
C	cyclophosphamide	
d	**melphalan**	
8.	zinc binding group in ACE inhibitor is	
a	alkyl group	
b	**sulfhydryl group**	
C	ester group	
d	amide group	
9.	Mode of action of dipyridamole is	
a	Ca channel blocker	
b	loop diuretics	
C	**vasodilation**	
d	potassium sparing diuretic	
10	furosemide is	
a	salicylic acid derivative	
b	**anthranilic acid derivative**	
C	benzoic acid derivative	

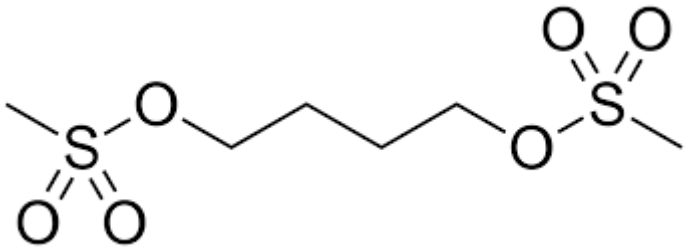
d	Thiazide devative	
11	Mechanism of action of Spironolactone is	
a	**interfere with Sodium and chloride reabsorption**	
b	Block Calcium channel	
C	Block Potassium channel	
d	ACE inhibitors	
12	mexiletine is specifically used for	
a	supraventricular arrythmia	
b	**prevetion of ventricular arrythmia**	
C	hypertension	
d	diuretic treatment	
13	phenytoin acts by	
a	**shorten phase 3 repolarization**	
b	K channel blockade	
C	prolongs phase 3 repolarization	
d	Na channel blockade	
14	clofibrate decrease significantly	
a	cholesterol level	
b	LDL level	
C	blood glucose level	
d	**plasma triglycerides**	

15	estrogen to 4-methylestrogen metabolism is carried out by	
a	16 α hydroxylase	
b	17 α hydroxylase	
C	**COMT and estrogen 2,4,hydroxylase**	
d	5 α reductese	
16	Write the name of the following drug.  	
a	Cortisone	
b	Hydrocortisone	
C	**progesterone**	
d	estrogen	
17	propylthiouracil is used as	
a	thyroid replacement therapy	
b	natural thyroid	
C	**hyperthyroidism**	
d	thyrotoxicosis	
18	following statement is wrong about meglitinides	
a	benzoic acid derivatives of glibenclamide	
b	shut down ATP sesnsitive K channel	
C	insulin secretogouges	

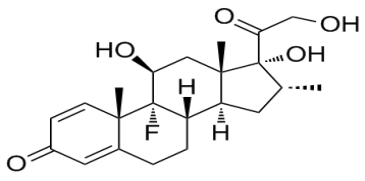
d	**α glucosidase inhibitor**	
19	What is the name of the structure given below?  	
a	Glipizide	
b	glibenclamide	
C	**Tolbutamide**	
d	Acrabose	
20	lignocaine is	
a	benzoic acid derivative	
b	aminobenzoic acid derivative	
C	**anilide derivative**	
D	nitrobenzoic acid derivative	

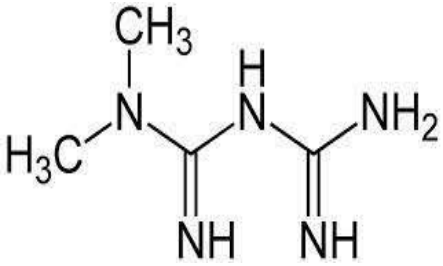
21	H1 Anti-histamines used for motion sickness and nausea include	
a	**Diphenhyadramine and meclinzine**	
b	Tornadol and meclinzine	
C	Ephedrine and Lauratidine	
d	Lauratidine	
22	Which of the following statements about histamines is correct?	

a	Histamine is stored in peripheral nerve endings	
b	**Histamine is released from mast cells following and allergic challenge**	
C	Histamine is a vasoconstrictor	
d	Histamine is an essential amino acid.	
23	Name the following drug.  	
a	**Omeprazole**	
b	Lancoprazole	
C	Rabeprazole	
d	Panteprazole	
24.	Which one of the following drugs bind with tubulin and arrest the cell cycle in metaphase.	
a	**Vinca**	
b	Nitrogen mustards	
C	Antimetabolites	
d	Alkylating agents	

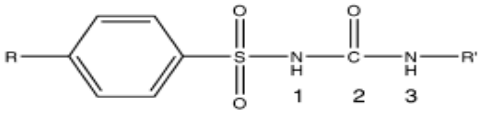
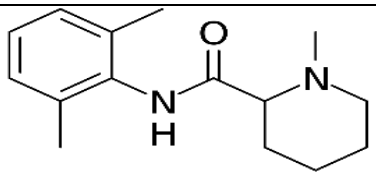
25.	What is this drug's mode of action? 	
a	Metallating agents	
b	Intercalater	
C	Chain terminator	
d	**Alkylating agents**	
26.	Which of the following type of angina is caused by Coronary Spasm	
a	Stable Angina	
b	Unstable Angina	
C	Crescendo Angina	
d	**Prinzmetal Angina**	
27.	The following drug acts at the proximal convulated tubule	
a	Hydrochlorothiazide	
b	Furosemide	
C	Spironolactone	
d	**Acetazolamide**	
28.	4-chloro-2-[(furan-2-ylmethyl) amino] 5-sulphamoylbenzoic acid is the IUPAC name of	
a	Hydrochlorothiazide	
b	**Furosemide**	
C	Spironolactone	

d	Acetazolamide	
29.	Which one is not PDE inhibitor	
a	Sildenafil	
b	Tadalafil	
C	**Testosterone**	
d	Acetildenafil	
30	Initial medication orders for the treatment of hypertension are likely to include any of the following except	
a	ACE Inhibitors	
b	**Beta blockers**	
C	Calcium channel blockers	
d	Thiazide type diuretics	
31	Mechanism of action of Mexiletine hydrochloride is	
a	**Block Sodium channel**	
b	Block Calcium channel	
C	Block Potassium channel	
d	Beta blockers	
32	The anti-arrhythmic drug with local anaesthetic action is	
a	Verapamil	
b	**Procanamide**	
C	Encainide	
d	Digoxin	

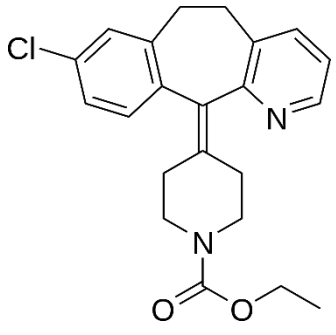
33	Which one of the following drug act by sequestering the bile acids in the GIT?	
a	**Colestipol**	
b	Lovastatin	
C	Probucol	
d	Niacin	
34	Mechanism of action of Digitoxin is	
a	Decrease in calcium uptake	
b	Increasein ATP synthesis	
C	Modifucation of of actin molecules	
d	**Increase in intracellular calcium level**	
35	Pregn-4-en-3,20 Dione is the IUPAC name for	
a	Estradiol	
b	Prednisone	
C	**Progesterone**	
d	Sildenafil	
36	 Write the name of the following drug.	
a	Cortisone	
b	Hydrocortisone	
C	**Dexamethasone**	

d	Betamethasone	
37	Following is a synthetic derivative of thyroxine	
a	Propylthiouracil	
b	Methimazole	
C	**Levothyroxine**	
d	Levothyronine	
38	Chlorpropamide is an example of	
a	Byguanides	
b	Thiazolidinediones	
C	Meglitinides	
d	**Sulphonylureas**	
39	What is the name of the structure given below?  	
a	Glipizide	
b	Tolbutamide	
C	**Metformin**	
d	Acrabose	
40	Which one of the following is a natural local anasthetic?	

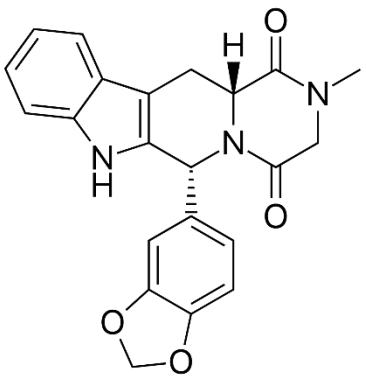
a	Lignocaine	
b	Benzocaine	
C	**Cocaine**	
D	Procaine	
41	The gauche conformer of histamine has a preferred affinity towards _____receptor/s	
a	H1	
b	H2	
C	**H3**	
d	H1 and H2	
42	A nitrate vasodilator causes	
a	Inhibition of soluble guanylate cyclase	
b	**Activation of soluble guanylate cyclase**	
C	Activation of myosin light chain kinase	
d	Inhibition of cGMP-dependent protein kinases	
43	With respect to chemical structure, Methotrexate differs from folic acid by	
a	Presence of -NH2 at position 4 and absence of -CH3 at N10	
b	Presence of -CH3 at position 4 and -NH2 at N10	
C	**Presence of -NH2 at position 4 and -CH3 at N10**	
d	Presence of -CH3 at position 4 and absence of -NH2 at N10	
44.	Which of the following statement is false related to structural features of cardiac glycoside?	
a	The aglycone portion of the cardiac glycosides is a steroid nucleus	

b	The steroid nucleus also carries two angular methyl groups at C-10 and C-13	
C	The lactone ring is present at C17 in aglycone part	
d	**Hydroxy group located at C14 in a steroid nucleus is a point of sugar attachment**	
45.	Which of the following stetement is false about sulfonylureas?  	
a	These are urea derivatives with an arylsulfonyl group in the 1-position and an aliphatic group at the 3-position	
b	**The aliphatic group, R', confers hydrophilic properties to the molecule.**	
C	Maximal activity results when R' consists of three to six carbon atoms	
d	Aryl groups at R' generally give toxic compounds	
46.	Hydralazine shows the presence of	
a	**Phthalazine**	
b	1,2,4-benzothiazine	
C	N-oxide of a piperidinopyrimidine	
d	Indole nucleus	
47.	Identify the following local anaesthetic agent.  	
a	Dibucaine	
b	**Mepivacaine**	
C	Prilocaine	
d	Etidocaine	

48.	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**	
49.	Which of the following local anesthetic is an ester of phenyl carbamic acid	
a	Dibucaine	
b	**Diperodon**	
C	Phanacaine	
d	Etidocaine	
50	Which of the following structural features are found 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	
51	The piperazine nucleus is present in all of the following drugs except	
a	Cetirizine	
b	Chlorocyclizine	
C	Meclizine	
d	**Phenindamine**	

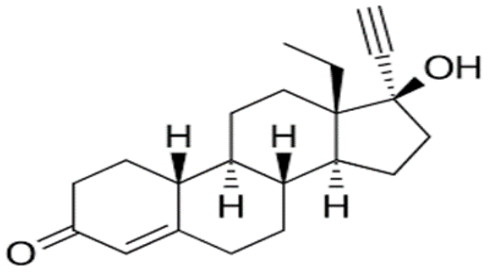
52	The potential nucleophilic site on DNA, which are susceptible to electrophilic attack by an alkylating agent is	
a	**N-7 position of guanine**	
b	N-7 position of adenine	
C	N-3 position of cytosine	
d	N-1 position of guanine	
53	Choose the correct non-dihydropyridine calcium channel blocker	
a	Nifedipine	
b	Amlodipine	
C	**Verapamil**	
d	Nicardipine	
54	Identify the class to which the following drug belongs 	

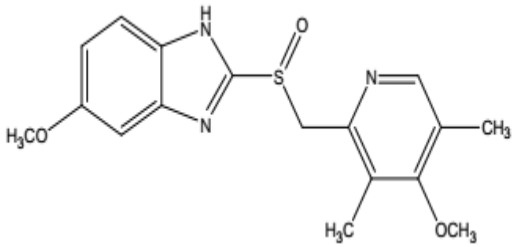
a	First generation H1 antihistaminics	
b	**Second generation H1 antihistaminics**	
C	H2 receptor antagonists	
d	Proton pump inhibtors	
55	Identify the active form of 5-Fluorouracil	
a	**5-FdUMP**	
b	5-FUMP	
C	5-FUTP	
d	5-FdUTP	
56	Name functional group present in methimazole	
a	**Thioamide**	
b	Carboxamide	
C	ketone	
d	Primary amine	
57	Select the correct name and use of the drug.	

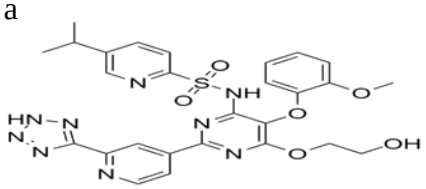
		
a	Testosterone, androgen	
b	Mifipristone, oral contraceptive	
C	**Tadalafil, used for erectile dysfunction**	
d	Estradiol, estrogen	
58	Which of the following antihyperlipidemic agent is a fibric acid derivative?	
a	**Clofibrate**	
b	Lovastatin	
C	Cholesteramine	
d	Cholestipol	
59	To which Chemical Class does Warfarin belongs?	
a	Indanedione derivative	
b	**Coumarin derivative**	
C	Thienopyridine-class	
d	Naphthoquinone	
60	Which form of thyroxine is biologically synthesized and is active	
a	**levo**	

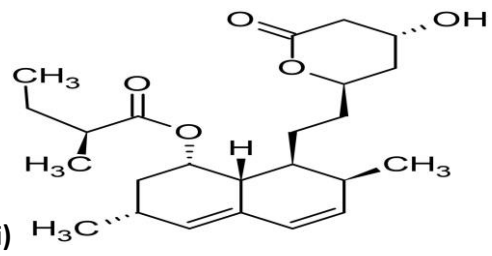
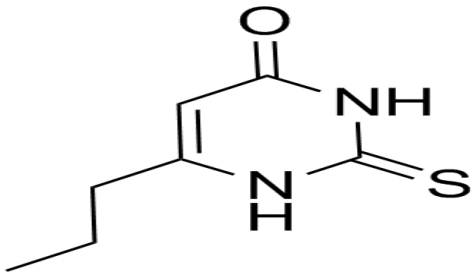
b	dextro	
C	meso	
D	recemic	

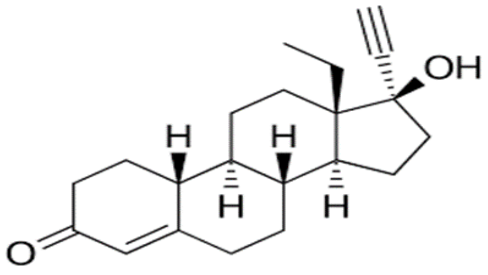
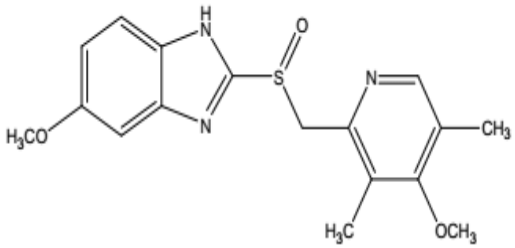
1	Give two examples (structures required) and the therapeutic indication of H1 antagonists using suitable examples and explain the mechanism of action of these compounds	**4mks**
2	Illustrate the mechanism of action of antimetabolites by giving suitable examples.	**4mks**
3	Outline synthesis and clonical use of Furosemide.	**4mks**
4	What are diuretics. Classify with examples. Discuss the SAR of Thiazide Diuretics.	**4mks**
5	Classify antiarrhythmic agents with examples and discuss Class III anti-arrhythmic drugs.	**4mks**
6	Write a note on HMG-CoA reductase Inhibitor.	**4mks**
7	Draw the structures. Write the mechanism of action, uses and metabolism of Benzocaine, Procaine, Lidocaine and Prilocaine.	**4 mks**
8	Discuss SAR of Sulfonylureas by citing suitable examples.	**4mks**
9	Draw the structure of Testosterone and give its chemical name. What is the effect of the following structural changes on the activity i)Addition of methyl group at C-17 α ii) Removal of C-19 carbon	**4mks**

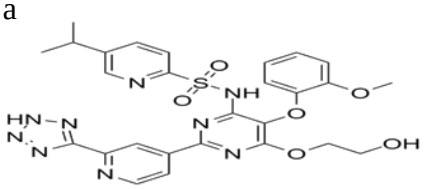
10	Answer the following with respect to given structure.  	**4mks**

a)	Name this structure.	
b)	Comment on its mechanism of action.	
c)	Write its therapeutic use.	
d)	List the adverse reactions.	
11	Answer the following with respect to given structure.  	**4mks**
i)	Name this drug.	
ii)	Comment on its mechanism of action.	
iii)	Write its therapeutic use.	
iv)	Comment on its metabolism.	
12	Outline chemical synthesis with reagents and reaction conditions for **any one** of the following.	**4mks**
i)	Meclorethamine	
ii)	Mercaptopurine	
13	Match the following	**4mks**

	i. Digoxin a  ii . Nesiritide b. Endothelin-1 antagonists iii. Bosentan c. Cardiotonic glycosides obtained from Digitalis lanata iv. Tezosentan d. Recombinant human B-type natriuretic peptide	
14	Outline the synthesis of Nitroglycerin OR Isosorbide dinitrate with reaction conditions and necessary reagents and write its use.	**4mks**
15	Answer the following.	**4mks**
i)	Enlist the zinc-binding groups of ACE inhibitors.	
ii)	What happens when Esterification of carboxylate group of ACE inhibitors takes place.	
iii)	Write down the mechanism of action of ACE inhibitors.	
	What happens after introduction of large hydrophobic heterocyclic rings on ACE inhibitors.	
16	Write a note on stereochemistry and metabolism of steroids	**4mks**
17	Answer the following.	**4mks**
	What will happen	
i)	After introduction of unsaturation in 'B' ring of estrangement.	
ii)	Epimerisation of 17 β-OH group	
iii)	Removal of 3-OH group	
iv)	Removal of ring 'A'	
18	Match the following	**4mks**

	i.Byguanides a. Tolbutamide	
	ii. Meglitinides b. Pioglitazone	
	iii.Thiazolidinediones c. Repaglinide	
	iv. Sulfonyl ureas d. Metformin	
19	Identify the given structures and indicate their therapeutic use i)  **ii)** 	**4mks**
20	Classify histamine H1 antagonist and comment on its structural requirements.	**4mks**
21	Classify anti-neoplastic agents with suitable examples .	**4mks**
22	Answer the following with respect to given structure.	**4mks**

		
a)	Name this structure.	
b)	Comment on its mechanism of action.	
c)	Write its therapeutic use.	
d)	List the adverse reactions.	
23	Answer the following with respect to given structure. 	**4mks**
i)	Name this drug.	
ii)	Comment on its mechanism of action.	
iii)	Write its therapeutic use.	
iv)	Comment on its metabolism.	
24	Outline chemical synthesis with reagents and reaction conditions for **any one** of the following.	**4mks**
i)	Meclorethamine	
ii)	Mercaptopurine	
25	Match the following.	**4mks**

	i. Digoxin a  ii . Nesiritide b. Endothelin-1 antagonists iii. Bosentan c. Cardiotonic glycosides obtained from Digitalis lanata iv. Tezosentan d. Recombinant human B-type natriuretic peptide	
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iii)	Write down the mechanism of action of ACE inhibitors.	
iv)	What happens after introduction of large hydrophobic heterocyclic rings on ACE inhibitors.	
28	Write a note on stereochemistry and metabolism of steroids	**4mks**
29	Answer the following.	**4mks**
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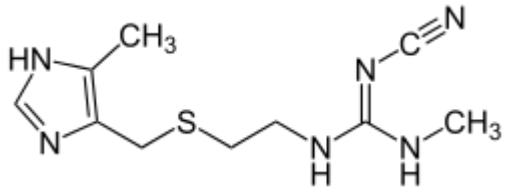
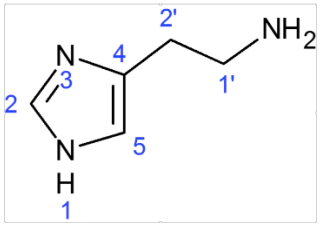
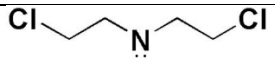
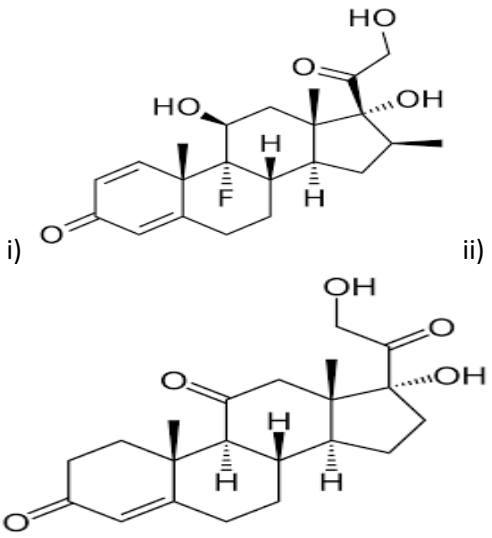
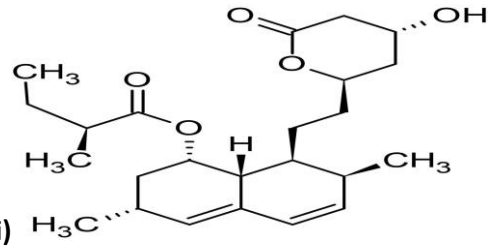
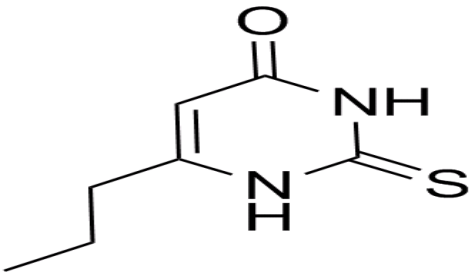
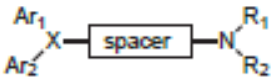
i)	After introduction of unsaturation in 'B' ring of estrangement.	
ii)	Epimerisation of 17 β-OH group	
iii)	Removal of 3-OH group	
iv)	Removal of ring 'A'	

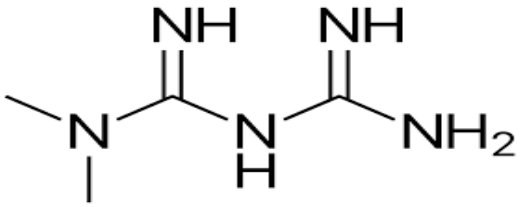
30	Match the following	**4mks**
	i.Biguanides a. Tolbutamide	
	ii. Meglitinides b. Pioglitazone	
	iii.Thiazolidinediones c. Repaglinide	
	iv. Sulfonyl ureas d. Metformin	
31	Classify anti-neoplastic agents with suitable examples (Structures needed).	**4mks**
32	**A.** Illustrate the activation pathway for Pantoprazole. Identify its target enzyme and the type of interaction	**4mks**
33	**B.** State whether following statements are true or false giving a suitable explanation. i. Fibrates are chemically propanoic acid derivatives. ii. Amiodarone is class-I antiarrhythmic agent.	**4mks**
34	Outline synthesis and clonical use of Furosemide.	**4mks**

35	Identify the given scaffold. Discuss the strategy that led to its rational development.  	**4mks**
36	Write a detailed classification of antiarrhythmic agents on the basis of mechanism of action giving one example (structures required) from each class. Describe the pH dependent effects of Class I antiarrhythmic agents	**4mks**
37	Answer following with respect to given structure.  a) Identify this structure. b) Comment on its activity at the H_1 and H_2 receptor. c) Predict the effect of the following structural changes on its activity: i. Introduction of a CH_3 group at position 5. ii. Replacement of α-amino group by a guanidino group.	**4mks**
38	Discuss any two examples and uses of proton pump inhibitors (structures required). Explain the mechanism of action of these compounds.	**4 mks**
39	Based on the structure given below answer the following questions.	**4mks**

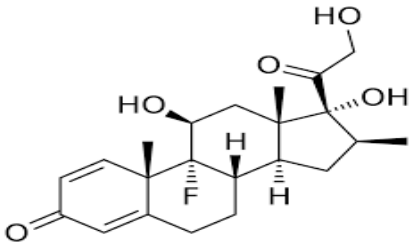
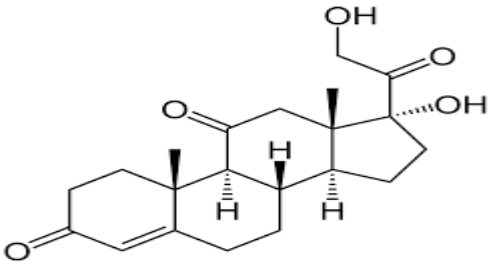
	 i) Identify the drug if R=CH_3, draw its structure & give its uses. Also mention its mechanism of action. ii) Indicate the advantage of having an aromatic ring on nitrogen instead of methyl group in N-mustards.	
40	What is angina pectoris? Write chemical classification of antianginal class of drugs. Support your answer with relevant structure	**4mks**
41	What are diuretics? Classify diuretic drugs based upon their site of action. Give one example with structures from each class.	**4mks**
42	Answer the following	**4mks**
i)	Enlist any two binding interactions of ACE inhibitors with a target molecule	
ii)	ii. Why o,o dichloro substitution is necessary in clonidine? Justify.	
43	What is erectile dysfunction? Give an example of a pyrazolopyrimidinone containing drug which is used for treatment of erectile dysfunction and describe its mechanism of action.	**4mks**
44	Discuss the structural activity features required for local anaesthetics activity giving examples.	**4mks**
45	Outline synthesis of furosemide or acetazolamide with reaction conditions and necessary reagents write its use.	**4mks**
46	Outline the chemical synthesis of triprolidine with reagents and reaction conditions.	**4mks**
47	Write a note on stereochemistry and nomenclate the following	**4mks**

	 i) ii)	
48	Answer the following.	**4mks**
	What will happen	
i)	After introduction of unsaturation in 'B' ring of estrangement.	
ii)	Epimerisation of 17 β-OH group	
iii)	Removal of 3-OH group	
iv)	Removal of ring 'A'	
49	Match the following	**4mks**
	i.Biguanides a. chlorpropamide	
	ii. Meglitinides b. Pioglitazone	
	iii.Thiazolidinediones c. Nateglinide	
	iv. Sulfonyl ureas d. Metformin	
50		
51	Identify the given structures and indicate their therapeutic use	**4mks**

	i)  ii) 	
52	Classify histamine H1 antagonist and comment on its structural requirements.	**4mks**
53	Classify anti-neoplastic agents with suitable examples and add a note on mechanism of action of antimetabolites (Structures needed).	**4mks**
54	Identify scaffold below and answer the questions  i) name and draw structure of any drug by substituting X with N ii) name of the prototype drug after replacing X with CHO iii) name the drug and give strucutre when X is repalaced by CH	**4mks**
55	Illustrate the mechanism of action of nitrogen mustard as an alkylating agent by giving suitable reactions pathway .	**4mks**
56	Outline synthesis and clonical use of Acetozolamide .	**4mks**
57	Classify diuretics . Outlie synthesis of chlorothiazide.	**4mks**

58	Classify antiarrhythmic agents with examples and discuss Class IB anti-arrhythmic drugs for mechanism of action . Draw strucutre of any one.	**4mks**
59	Describe Mechanism of action of HMG CoA reductase inhibitors and describe SAR .	**4mks**
60	Classify local anaesthetic chemically with one structure of each class. Describe the mechanism of action of Benzocaine and lidocaine	**4 mks**
61	Discuss SAR of thiazolidinediones by citing suitable examples.	**4mks**
62	Draw the structure of estradiol and give its chemical name. What is the effect of the following	**4mks**
	i)Addition of hydroxyl group at 6,7 and 11	
	ii) substitution of 17α with ethynyl group	
63	Describe Mechanism of action of Cardiac glycosides and cholestipol	**4mks**
64	Answer the following with respect to given structure.  	**4mks**
i)	Name this drug.	
ii)	Comment on its mechanism of action.	
iii)	Write its therapeutic use.	
iv)	Comment on its metabolism.	
65	Outline chemical synthesis with reagents and reaction conditions for **any one** of the following.	**4mks**
i)	Meclorethamine	

ii)	Mercaptopurine	
66	Match the following.	**4mks**
	. i. Chlorpheniramine a antimetabolite ii. Doxyylamine b. Nitrogen mustard iii. Melphalan c. ethanolamine ether iv. Azathioprine d. Alkylamine group	
67	Outline the synthesis of Diisopyramide OR Warfarin with reaction conditions and necessary reagents and write its use.	**4mks**
68	Answer the following.	**4mks**
i)	Answer the following.	
ii)	Enlist the binding interaction of ACE inhibitors.	
iii)	state condition for optimum activity condition in respect to stereochemistry aspect .	
iv)	Write the mechanism of action of ACE inhibitors.	
69	Write a note on stereochemistry and metabolism of steroids	**4mks**
70	Answer the following.	**4mks**
	What will happen in progestins if	
i)	Removal of CH3 group at 19 position	
ii)	Unsaturation of B or C ring	
iii)	Introduction of C6 α with halogen	
iv)	Unsaturation at C6 and C7	

71	Identify the given structures and comment on metabolism i)  ii)  	**4mks**
72	Describe SAR of local anaesthetic and comment on mechanism of action .	**4mks**
73	Classify anti-neoplastic agents with suitable examples (Structures needed).	**4mks**