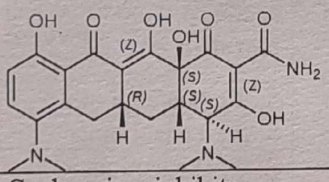
MC 3
6 attt
8/10/24

3 Hours

Total Marks: 75

Q.I	Answer the following Multiple Choice Questions. Select the most appropriate option for each statement.			20M
	Questions		Options	
1	Solid phase synthesis is frequently used in combinatorial chemistry. Which means?	a	Reactions are carried out without solvent	
		b	Reagents and reactants are attached to a solid phase support	
		c	Reagents are used in the solid phase	
		d	Molecules are constructed on a solid phase support	
2	Identify an active metabolite from the following	a	Chloroquine	
		b	Cycloguanil	
		c	Mefloquine	
		d	Amodiaquine	
3	Example of a penicillinase resistant penicillin is	a	Clavulanic acid	
		b	Penicillin V	
		c	Penicillin G	
		d	Cloxacillin	
4	Taft constant is a measure of	a	Lipophilicity of substituent	
		b	Log P of substituent	
		c	Steric effect of substituent	
		d	Electronic effect of substituent	
5	Identify the following drug 	a	Oxytetracycline	
		b	Chlortetracycline	
		c	Minocycline	
		d	Doxycycline	
6	Cycloserine inhibits	a	D-alanine racemase	
		b	D-alanine kinase	
		c	DNA Ligase	
		d	Reverse Transcriptase	
7	According to USP, penicillin contains _____ chiral centres	a	Three	
		b	Four	
		c	Two	
		d	Five	
8	Drug containing bis-triazole ring is	a	Fluconazole	
		b	Itraconazole	
		c	Tinidazole	
		d	Tioconazole	

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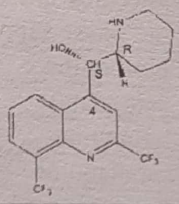
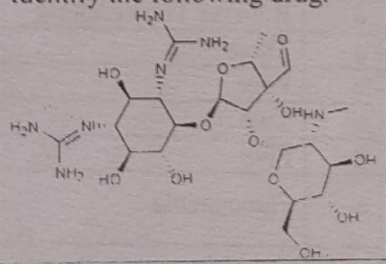
9	Which guanosine analog is used against Influenza A & B?	a	Ribavirin
		b	Nevirapine
		c	Etavirenz
		d	Loviride
10	Acyclic deoxyguanosine analog of acyclovir is	a	Rimantadine
		b	Ganciclovir
		c	Indinavir
		d	Amantadine
11	Identify the drug 	a	Quinacrine
		b	Mefloquine
		c	Primaquine
		d	Pamaquine
12	The drug used in the treatment of river blindness is	a	Tinidazole
		b	Ornidazole
		c	Ivermectin
		d	Diloxanide
13	Prodrug is	a	chemically modified active drug precursor
		b	biologically modified inert drug precursor
		c	naturally available inert drug precursor
		d	chemically modified inert drug precursor
14	Ethambutol is used for antiTB activity as _____	a	S, R (+) enantiomer
		b	S, R (-) enantiomer
		c	S, S (+) enantiomer
		d	R, R (+) enantiomer
15	Identify the following drug. 	a	Streptomycin
		b	Azithromycin
		c	Clarithromycin
		d	Erythromycin
16	Prontosil on metabolic activation leads to	a	Sulfanilamide
		b	Sulphacetamide
		c	Sulfadiazine
		d	Sulfapyridine

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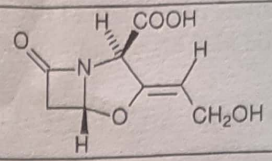
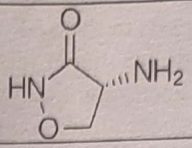
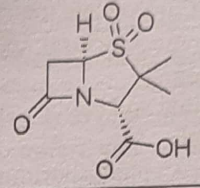
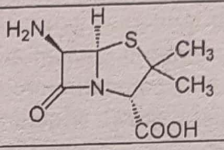
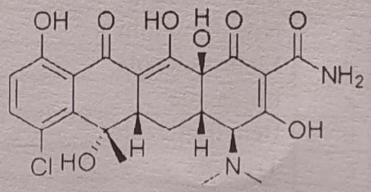
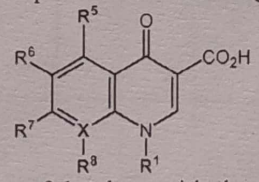
17	Identify the appropriate structure of sulbactam	a		
		b		
		c		
		d		
18	Which of the following is Urinary tract anti-infective agent.	a	Isoniazid	
		b	Mebendazole	
		c	Nitrofurantoin	
		d	Metronidazole	
19	Identify the heterocyclic ring present in Metronidazole	a	Imidazole	
		b	Benzimidazole	
		c	Triazole	
		d	Isoxazole	
20	Sequential steps involved in pharmacophore mapping are as follows	a	training and test set preparation, model development and selection, external validation of selected models	
		b	model development and selection, training and test set preparation, external validation of selected models	
		c	model development and selection, external validation of selected models training and test set preparation	
		d	training and test set preparation, external validation of selected models, model development and selection	

Q.II	**Attempt ANY TWO of the following. Draw structures wherever required.**	20M
1A	With regards to the SAR of Penicillins, state whether the following statements are true or false. and justify the same with suitable examples. a) Electron withdrawing group on acylamino side chain at 6th position render amide oxygen less nucleophilic b) Carboxylate ion at C-2 bind to Leucine residue in the binding site.	4M
1B	Explain the structural features of aminoglycosides with the help of suitable examples.	4M
1C	Give name and explain any two structural features of the 15 membered macrolide.	2M
2A	Classify Cephalosporins based on their generation. Give structure and use of one drug of each generation.	4M
2B	Draw the structures of any two β lactamase inhibitors and explain their importance in antimicrobial therapy.	4M
2C.	Discuss any two structural modifications of Artemisinin derivatives and its effects.	2M
3A	With reference to the following structure, answer the following questions:	4M



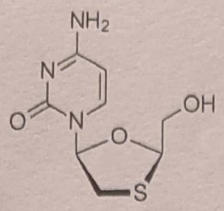
i) Identify the chemical class and generic name of the drug.
ii) Classify the above drug based on its duration of action.
iii) Draw the structure of any salt form of the drug.
iv) What will happen if the amide group of the drug is replaced by nitrile?

3B	a) Give the structures of two drugs of Monobactam class.	2M
	b) Depict the reaction for acidic degradation of Cephalosporins.	2M
3C	Draw the structure of Pyrimethamine. Why is it given in combination with sulfadoxine?	2M
Q.III	Attempt **any Seven out of given Nine questions.**	35M
1.	a) Justify with structure - Fast acetylators are given a high dose of INH.	3M
	b) Outline the route of the synthesis of INH along with suitable reagents.	2M
2.	Answer the following with respect to the following scaffold.	5M

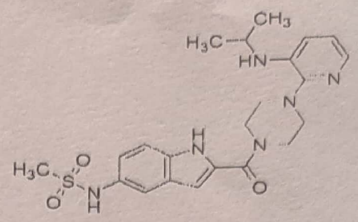


a) Write name and structure of the drug with the given scaffold having R1 as cyclopropane.
b) Write name and structure of drug with anneletion of R1 and R8 position
c) Indicate impact of substitution at R7 position
d) Comment on substitution that influences phototoxicity.
e) Write name and structure of the drug when X=N for above scaffold.

3. Identify following drugs and classify them as NRTI and NNRTI antiviral drugs. Explain the rationale for Combining NRTI and NNRTIs in HIV treatment. 5M



a)



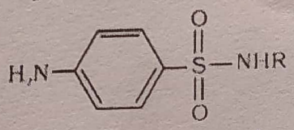
b)

4. A.Match the following 4 M

Name	Class	Mechanism of Action
Amphotericin	Imidazole antifungal drug	Binds to protein tubulin and interfere with mitotic spindle formation
ketoconazole	Antifungal antibiotic	Membrane disruptors
Griseofulvin	Polyene antibiotic	14 alpha demethylase inhibitor
Naftifine	Allylamine antifungal drug	Squalene epoxidase inhibitor

B. Write structure of Rimantadine 1M

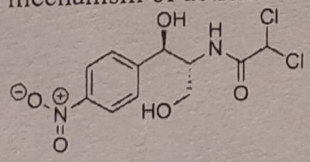
5. Answer the question with respect to the given structure below. 5M



a) Name the class and use of drugs containing the above scaffold.
b) Give the structure of prodrug belonging to above class
c) Comment on the nature of the drugs consisting of the above scaffold.
d) Name the enzyme inhibited by drugs with this scaffold.
e) Identify R group present in sulfacetamide

6. A. Outline the route of synthesis for Metronidazole 3M
B. Elaborate the mechanism of action of Penicillins. 2M

7. A. Identify the drug and write two structural features which are involved in the mechanism of action. 3M



B. Write structure and mechanism of action of Praziquantel. 2M

8. Explain the different pharmacophore elements in pharmacophore mapping. 5M

9. Explain combinatorial chemistry? Give its advantages and disadvantages. 5M

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