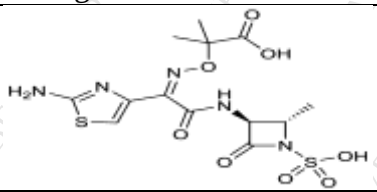
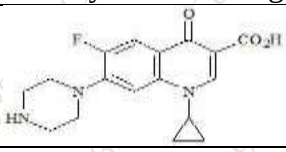
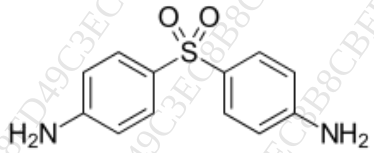
Time: 3 Hrs **Marks: 75**

Q.I Answer the following Multiple Choice Questions. Select the most appropriate option for each statement. 20M

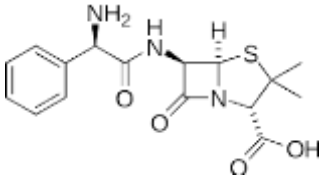
Sr No	Questions		Options
1	What crucial feature of a penicillin is involved in its mechanism of action?	a	Carboxylic acid
		b	β-lactam ring
		c	Acyl side chain
		d	Thiazolidine ring
2	Which of the following is not the degradation product of penicillin?	a	Penillic acid
		b	Penicilloic acid
		c	Penicillin V
		d	Penicillamine
3	Identify the target for clavulanic acid?	a	The transpeptidase enzyme
		b	L-ala racemase
		c	β-lactamase
		d	Penicillin acylase
4	In tetracycline, the pka value of conjugated trione system is in the range of	a	7.2-7.8
		b	9.1-9.7
		c	2.8-3.3
		d	6.4-6.8
5	To which class does the following drug belong 	a	Cephalosporins
		b	Aminoglycoside
		c	Tetracycline
		d	Monobactams
6	Endoperoxide 1, 2, 4-trioxane ring is responsible for the antimalarial action of	a	Artemether
		b	Primaquine
		c	Pyrimethamine
		d	Quinacrine
7	Identify the following structure 	a	Ciprofloxacin
		b	Nalidixic Acid
		c	Lomefloxacin
		d	Ofloxacin
8	Two pharmacologically active agents coupled together are called as	a	Mutual prodrug
		b	Bioprecursor

		c	Polymeric prodrug
		d	Biotransformation
9	Identify the enantiomer of ethambutol which shows selective & powerful antitubercular activity	a	S, R (+) enantiomer
		b	R, S (+) enantiomer
		c	S, S (+) enantiomer
		d	R, R (-) enantiomer
10	N-acetyl isoniazid is the major metabolite of isoniazid produced by acetylation by	a	Amidase
		b	N-acetyl transferase
		c	Esterase
		d	Hydrolysis
11	……..antibiotic was obtained by fermentation from cultures of *Streptomyces mediterranei*	a	Rifabutin
		b	Cycloserine
		c	Isoniazid
		d	Rifampicin
12	Which one of the following antiviral agent exhibits the greatest selective toxicity for the invading virus?	a	Amantadine
		b	Acyclovir
		c	Rimantadine
		d	Zidovudine
13	Identify an inhibitor of viral protease	a	Saquinavir
		b	Acyclovir
		c	Zalcitabine
		d	Lamivudine
14	Identify antifungal antibiotic with heterocyclic benzofuran moiety	a	Amphotericin-B
		b	Nystatin
		c	Natamycin
		d	Griseofulvin
15	Drug of choice for the treatment of filariasis is	a	Diethyl carbamazine(DEC)
		b	Praziquantel
		c	Niclosamide
		d	Mebendazole
16	Identify the given drug	a	Dapsone
		b	Sulfanilamide
		c	Sulfamethoxazole
		d	sulfone
17	Sulfonamide used for burn therapy	a	Sulfamethoxazole
		b	Sulfacetamide
		c	Silver sulfadiazine
		d	Sulfasalazine

18	The term used for drug discovered by accident or conventional approach	a	Drug discovery by serendipity
		b	Rational drug design
		c	HTS
		d	CADD
19	Lipinki's rule of 5 is used for	a	Docking
		b	Drug likenees
		c	Dynamic simulation
		d	Similarity search
20	Identify the QSAR parameter, which is a measure of electron withdrawing or electron donating ability of a substituent.	**a**	Hammett constant
		b	Taft constant
		c	Molar refractivity
		d	Partition coefficient

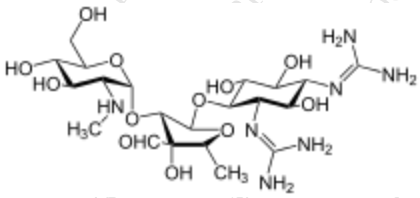
Q.II Attempt <u>ANY TWO</u> of the following. Draw structures wherever required. 20M

Q1. a. Identify following drug and explain acid stability in detail of the same. **4M**



b. Identify the class of following antibiotic and write three structural features for the same.

4M

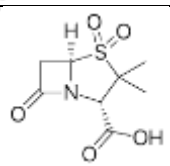


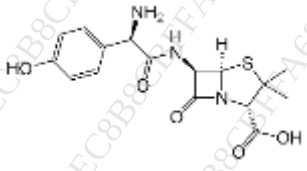
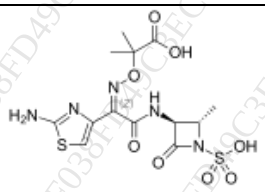
c. Explain two structural features of macrolide antibiotic and write names of two antibiotics from this class. **2M**

Q2.

a. Discuss classification of cefalosporins with examples for each. Write appropriate structures wherever needed. **4M**

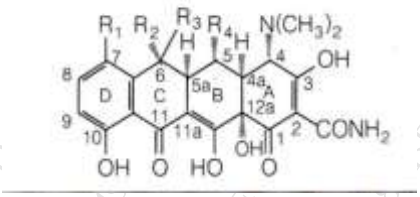
b. Match the following pairs **4M**

Sr No.	**Name**	**Structure**	**Mechanism of action**
1	a. Aztreonam	i. 	x. Inhibition of mucopeptide synthesis

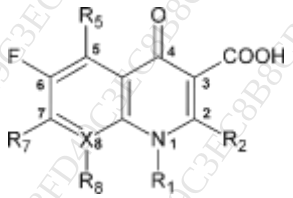
2	b. Sulbactam	ii. 	y. Inhibition of β-lactamase
		iii. 	z. Inhibition of transpeptidase

c. Explain any one DHFR inhibitor with structure and mechanism of action. **2M**

Q. 3. a. Write degradation reaction and products for following scaffold in acidic as well as basic medium . **4M**



b. With reference to the following scaffold, answer the following questions: **4M**



By substituting appropriate groups at positions R_7 and R_1 explain effects on antibacterial activityin detail along with respective structure. (**One for each**.)

c. Explain importance of Prodrugs in biological activity of the drugs. Write example of carrier linked prodrug with it's use. **2M**

Q III Answer <u>Any 7</u> of the following questions: (35 M)

Q1. Match the following. **(5M)**

Generic name	Chemical class	Mechanism of action
Ethionamide	an aminoglycoside antibiotic	blocking the ability of 30S ribosomal subunits to make proteins
PAS	An antibiotic	Competitive inhibitor of PABA
Pyrazinamide	Salicylic acid derivative	D-alanyl- ligase inhibitor
Streptomycin	Thioamide analogue of isoniazid	Mycolic acid synthesis inhibitor
Cycloserine	Pyrazine derivative	FASI (Fatty acid synthase inhibitor)

Q2.A. Give the synthetic scheme for synthesis of Ciprofloxacin. **(4M)**

B. Write name and structure of fluoroquinolone that reduces phototoxicity. (**1M)**

Q3.A. Give the synthetic scheme for acyclovir mentioning reagents & reaction conditions. **(4M)**

B. Write MOA of Ribavirin. (**1M)**

Q4. Classify antifungal agents given below based on chemistry, explain MOA in brief with structure(any two): Griseofulvin, Clotrimazole, Tolnaftate **(5M)**

Q5.A. Give the synthetic scheme for Dapsone mentioning reagents & reaction conditions. **(3M)**

B. Name the target for sulphonamides drugs. Write the structure of sulphonamides used for ulcerative colitis. **(2M)**

Q6. Write class. Structure, and mechanism for the following.(Any Two) **(5M)**

i. Sulphamethoxazole
ii. Diloxanide
iii. Mebendazole

Q7. A. Indicate to which mechanistic & therapeutic class the following drugs belongs to (Structures to be written) **(5M)**

a) Chloramphenicol
b) Diethyl carbamazine citrate

Q8. Enlist Physicochemical parameters used in QSAR? Explain application of any two parameters. **(5M)**

Q9. Define combinatorial chemistry & write its applications.Explain solution phase synthesis. **(5M)**

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