Name: **Enrolment No:**	

UPES

End Semester Examination, May 2025

Course: Medicinal Chemistry-III **Semester: VI**
Program: B. Pharm **Duration: 03 Hours**
Course Code: BP601T **Max. Marks: 75**

Instructions: Read each question carefully. Attempt all questions under Section A (20 x 1 marks). Attempt any two questions out of three under Section B (2 x 10 marks). Attempt any seven questions out of nine under Section B (7 x 5 marks).

SECTION A

(20 Q x 1 M = 20 Marks)

S. No.	Attempt all questions from section A.	Marks	COs
Q 1	What is the mechanism of action of tetracyclines? (A) Inhibiting peptidoglycan synthesis (B) Blocking bacterial 30S ribosomal subunit (C) Inhibiting bacterial DNA polymerase (D) Disrupting the bacterial membrane	**1**	CO1
Q 2	Which drug is known to cause Cinchonism as a side effect? (A) Quinine (B) Artemisinin (C) Atovaquone (D) Clindamycin	**1**	CO1
Q 3	What is the mechanism of action of artemisinin and its derivatives? (A) Inhibition of folic acid synthesis (B) Disruption of mitochondrial function (C) Generation of free radicals that damage the parasite (D) Inhibition of protein synthesis	**1**	CO1
Q 4	What crucial features of Quinolines are vital for the antimalarial activity? (A) Quinoline ring (B) Secondary OH at 9^{th} position (C) 4-5 carbon chain length between secondary OH and terminal tertiary amine (D) All of the above	**1**	CO1
Q 5	Which anti-amoebic drug is imidazole derivative? (A) Atovaquone (B) Diloxanide (C) Ornidazole (D) Tinidazole	**1**	CO1
Q 6	Which one of the following anti-helminthic drugs is a benzimidazole derivative? (A) Albendazole (B) Praziquantel (C) Niclosamide (D) Diethylcarbamazine	**1**	CO1
Q 7	Which antifungal drug was isolated from *Streptomyces griseus*? (A) Griseofulvin (B) Amphotericin-B (C) Tolnaftate (D) Miconazole	**1**	CO1
Q 8	Which of the following is the primary target of azole antifungal drugs? (A) DNA synthesis (B) Ergosterol synthesis (C) Chitin synthesis (D) Protein synthesis	**1**	CO1
Q 9	Which of the following antibiotics contains a Dihydrothiazine core in its chemical structure? (A) Chloramphenicol (B) Doxycycline (C) Cephalothin (D) Streptomycin	**1**	CO1

Q 10	Which of the following antibiotics is an aminoglycoside? (A) Erythromycin (B) Streptomycin (C) Carbapenam (D) Chloramphenicol	**1**	CO1
Q 11	Which antifungal agent is commonly used for treating systemic fungal infections but is associated with nephrotoxicity? (A) Fluconazole (B) Amphotericin B (C) Terbinafine (D) Griseofulvin	**1**	CO1
Q 12	Which one of the following antibiotics is a macrolide? (A) Chloramphenicol (B) Doxycycline (C) Erythromycin (D) Streptomycin	**1**	CO1
Q 13	Which one of the following Penicillins is resistant to both acid and penicillinase? (A) Methicillin (B) Ampicillin (C) Cloxacillin (D) Phenoxymethylpenicillin	**1**	CO1
Q 14	Who discovered Penicillin? (A) Paul Ehrlich (B) Gerhard Domagk (C) Alexander Fleming (D) D. Watson	**1**	CO1
Q 15	Which of the following is the substructure common in Tetracyclines? (A) Thiazolidine (B) Thiazoline (C) Octahydronaphthacene (D) β-lactam	**1**	CO1
Q 16	Which of the following drug(s) acylate the bacterial transpeptidase? (A) Cephradine (B) Amoxicillin (C) Erythromycin (D) Both Cephradine and Amoxicillin	**1**	CO1
Q 17	Aminoglycosides prevents the bacterial protein synthesis by irreversibly binding to _____. (A) 50S ribosomal subunit (B) 30S ribosomal subunit (C) DHFR (D) Penicillinase	**1**	CO1
Q 18	_____ substructure is common in Mebendazole and Albendazole? (A) Thiazole (B) Pyrimidine (C) Benzimidazole (D) Nitro-imidazole	**1**	CO1
Q 19	The cell wall cross-linking process is interrupted by: (A) Nystatin (B) Cephalexin (C) Tetracycline (D) Spectinomycin	**1**	CO1
Q 20	Correct IUPAC name of the drug Ethionamide is: (A) 2-Ethyl isonicotinamide (B) 2-Ethyl thioisonicotinamide (C) 3-Ethyl isonicotinamide (D) 3-Ethyl thioisonicotinamide	**1**	CO1
SECTION B (20 Marks) **(2 Q x 10 M = 20 Marks)**			
	Attempt any two questions from section B.	**Marks**	
Q 1	Describe the mechanism of action and draw chemical structures of first-line antitubercular drugs.	**4x2.5**	CO3

Q 2	Explain the mechanism of action and SAR of Tetracyclines. Write the scheme for the synthesis of any one of the following drugs: (a) Chloramphenicol (b) Chloroquine	**6+4**	CO4
Q 3	(a) Discuss the mechanism of action and SAR of 4-aminoquinoline-based antimalarial drugs. (b) Draw the chemical structure of Artemisinin.	**10**	CO4
SECTION-C (35 Marks) **(7 Q x 5 M = 35 Marks)**			
	Attempt any seven questions from section C.	**Marks**	
Q 1	Draw the scheme for the synthesis of Mebendazole.	**5**	CO2
Q 2	Write the chemical structure, mechanism of action, and uses of Amphotericin B.	**5**	CO2
Q 3	Explain the classification of antimalarial agents with suitable examples.	**5**	CO2
Q 4	Explain the classification of antiviral agents with suitable examples.	**5**	CO2
Q 5	Explain the SAR of Cephalosporins with suitable examples.	**5**	CO4
Q 6	Discuss the synthesis and mechanism of action of Dapsone.	**5**	CO5
Q 7	Discuss roles of β-lactamase inhibitors in overcoming bacterial resistance with suitable examples.	**5**	CO4
Q 8	Explain the role of Sulfamethoxazole and Trimethoprim in inhibiting bacterial folic acid synthesis. Why are they used in combination?	**5**	CO3
Q 9	Explain the similarities and differences in the general structures of Penicillin and Cephalosporin.	**5**	CO3