B.Pharm Even Semester Examination, May, 2025

PHARMACEUTICAL SCIENCES
(6th Semester)

Course No: BP-601T
(Medicinal Chemistry-III)

FM: 75
Time: 3 Hours

The figures in the right margin indicate full marks for the question

I. A. Multiple Choice questions: 1x10=10

1. In solid-phase synthesis, the starting molecule is attached to:
   (i) A solvent
   (ii) A catalyst
   (iii) An insoluble resin or solid support
   (iv) A reaction vessel

2. Which approach in drug design involves modifying known active molecules?
   (i) Structure-based design
   (ii) Combinatorial chemistry
   (iii) De novo drug design
   (iv) Ligand-based drug design

3. A pharmacophore is best defined as:
   (i) A 3D representation of a molecule

(ii) The exact receptor where the drug binds

(iii) The spatial arrangement of features essential for biological activity

(iv) The toxicological profile of a compound

4. Griseofulvin exerts its antifungal effect by:

(i) Inhibiting ergosterol synthesis

(ii) Binding to ergosterol to form membrane pores

(iii) Disrupting fungal mitosis by interacting with microtubules

(iv) Inhibiting squalene epoxidase

5. Which of the following is a topical imidazole antifungal?

(i) Clotrimazole (ii) Terconazole

(iii) Itraconazole (iv) Fluconazole

6. Which of the following is used as a treatment for African sleeping sickness?

(i) Iodoquinol

(ii) Atovaquone

(iii) Eflornithine

(iv) Pentamidine Isethionate

7. Methenamine acts as a urinary antiseptic by:

(i) Binding to DNA

(ii) Inhibiting folic acid synthesis

(iii) Releasing formaldehyde in acidic urine

6. Classify and write the SAR of sulphonamides. 2+3

7. Describe synthesis and mechanism of action of Chloramphenicol. 3+2

8. Write a short note on antitubercular antibiotics. 5

9. Discuss various degradation reactions of penicillins. 5

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(iv) Inhibiting protein synthesis

8. Which of the following quinolones has a fluorine atom at position 6 and a piperazine ring at position 7?

(i) Nalidixic Acid (ii) Norfloxacin

(iii) Furazolidine (iv) Methenamine

9. Azithromycin differs structurally from erythromycin by:

(i) Removal of one hydroxyl group

(ii) Addition of an extra amine group

(iii) Replacement of a carbon atom with a nitrogen in the lactone ring (15-membered ring)

(iv) Aromatization of the macrolide ring

10. Neomycin is mainly used for:

(i) Intravenous injection

(ii) Topical and oral use due to toxicity

(iii) CNS infections

(iv) Malaria

I. B Objective type 2x5=10

Outline the synthetic schemesfor the following drugs

1. Miconazole

2. Sulfamethoxazole

3. Amantadine

4. Mebendazole

5. Nitrofuratoin

II. Long answers (Answer two out of three questions) 10x2=20

1. Write in details about chemistry, classification, SAR and mechanism of action of quinolones. 2+2+4+2

2. Define prodrug. Discuss in details about the classification of prodrugs with proper examples. Elaborate the pharmaceutical applications of prodrug. 1+6+3

3. What is drug design? Discuss various approaches used in drug design. Write in details about the physicochemical parameters used in QSAR studies. 1+4+5

III Short answers (Answer seven out of nine questions) 5x7=35

1. Write briefly about the chemistry and SAR of macrolides. 2+3

2. Discuss in brief about the drugs used in the treatment of helminthiasis. 5

3. Write in brief about the life cycle of malaria parasites. Mention the synthetic procedure for the preparation of pamaquine. 3+2

4. Classify and discuss the SAR of cephalosporins. 2+3

5. Write a short note on natural antifungal agents. 5