Question Paper

Exam Date & Time: 14-Jul-2023 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

Medicinal Chemistry III [PCH-BP601T-S1]

Marks: 75 **Duration: 180 mins.**

I Multiple Choice Questions (MCQs)

Answer all the questions. Section Duration: 30 mins

1) What is the purpose of using a prodrug that is activated by a specific enzyme? (1)

- To increase the drug's bioavailability
- To target the drug to a specific tissue or cell type
- To reduce the toxicity of the drug.
- To improve the pharmacodynamics of the drug.

2) The number of asymmetric centers in Erythromycin are (1)

- 8
- 5
- 10
- 12

3) Following is one of the reactant used along with glycerol in the synthesis Pamaquine (1)

- 3-methoxy -2-nitro aniline
- 4-methoxy -2-nitro aniline
- 4-methoxy-3-nitro aniline
- 3-methoxy-3-nitro aniline

4) One of the following isomer of Ethambutol is most active (1)

- Leavo isomer
- Dextro isomer
- Meso isomer
- racemic mixture

5) Which of the following medications is commonly used to treat complicated urinary tract infections? (1)

- Amoxicillin
- Ciprofloxacin
- Nitrofurantoin
- Trimethoprim/sulfamethoxazole (TMP/SMX)

6) The typical reagent to perform the final cleavage of the peptide from the resin together with the removal of the side chain protecting groups in Solid phase synthesis is: (1)

- Fluoroacetic acid
- Chloroacetic acid

Trifluoroacetic acid
Trichloroacetic acid

7) Why antiviral drugs cannot cure HIV? (1)

They cannot block viral transcription
They do not block viral replication
They cannot block viral translation
They do not penetrate the cells

8) The Merrifield resin is a suitable linker for (1)

Carbohydrates
Peptides
Amines
Carboxamides

9) Which of the following antimalarial drugs is a synthetic analogue of quinine? (1)

Artemether
Mefloquine
Chloroquine
Primaquine

10) Which one is false for Amino-glycosides? (1)

Quickly break down in stomach
Acidic and make salts with base
Unable to cross BBB
Highly polar and water soluble

11) Which of the following statements is false for penicillins (1)

The two hydrogen atoms on beta-lactam ring are in Cis confirmation
C-N in beta-lactam is the site for Penicillinase action
A carboxylic acid which makes the molecule highly unstable
Carbonyl group on Beta-lactam is very reactive

12) In the general structure of Cephalosporin if you substitute S with O and C We get (1)

Meropenem and Ertapenem respectively
Oxacepham and Carbacepham respectively
Oxapenem and Carbapenem respectively
Aztreonam and Monobactam respectively

13) A 20 fold increase in the biological activity is achieved in tetracycline with following modification (1)

Elimination of hydroxy group at 6th position
Converting free Carboxamide group to Nitrile group
Converting 3-hydroxy group to Nitrile groupx
Adding a glycylamino group to 9th position

14) The Cephalosporins compete for (1)

Adenyl-D-Ala-D-Phy protein precursor
Acyl-D-Ala-D-Ala cell wall precursor
Carbapenem precursor
Beta lactam precursor

15) Amphotericin B has (1)

Hydrophilic glycol region
Hydrophilic heptene region
Hydrophilic polyol region
Hydrophobic polyol region

16) Natural antifungal agent Griseofulvin contains (1)

Three methoxy group
Two methyl group
A thiophene ring
One chloro and two methyl group

17) The starting material for the synthesis of Econazole is (1)

2,4-dichloromethyl benzene
2,4-dichloroacetophenone
2,3-dichloroacetophenone
2,3-dichloromethyl benzene

18) Following drug is an example for Halogenated 8-Hydroxyquinolines (1)

Atervoquinol
Mepacrine
Quinacrine
Clioquinol

19) Although amphoteric, Sulphonamides generally function as (1)

Weak acids due to the presence of SO2 NH2 group
Weak base due to the presence of SO2 NH2
Weak antibacterial due to the capacity of formation of sodium salt
Strong base due to the presence of NH2

20) Partition coefficient, P in QSAR, is a measure of relative affinity of a molecule for the lipid and aqueous phase (1)

In the presence of ionization.
In the presence of protonation
In the absence of ionization.
In the absence of solubility

II Long Answers

Answer all the questions.

1) Explain the SAR of Erythromycin. Outline the synthesis of chloroquine with names of all intermediates and reagents. (10)
intermediates and reagents. What are the advantages and applications of prodrugs. (4+3+3=10)

2)	Explain the SAR and mechanism of action of INH with diagram. Outline the synthesis ofCiprofloxacin with names of reactants, intermediates, product and reaction condition. Write the structure of Ribavarine and Didanosine and mention their uses. (5+3+2=6)	(10)

III Short Answers

Answer all the questions.

1)	Explain any one method of solid phase synthesis with an example. List out 5 importantcombichem applications(3+2=5)	(5)
2)	Classify chemically, Beta-lactam antibiotics giving the general structure and examples. 4M What is the general mechanism of action of Beta-lactam antibiotics 1M	(5)
3)	Write the structure and uses of Azlocillin and Cephalothine. 4M Name any two monobactams 1M	(5)
4)	Give the chemical classification of antifungal agents giving examples. 4M Write the structure of Trimethoprim and its mechanism of action. 1M	(5)
5)	Draw the general structure and explain the SAR features of Sulphonamide antibacterial agents. 4M Write the structure and IUPAC naming of Diethycarbamazepine. 1M	(5)
6)	Give the chemical classification of Anthelmintic drugs giving examples. 4M Write the structure and IUPAC naming of Metronidaole. 1M	(5)
7)	Enlist the essential steps involved in QSAR studies. Explain log P as a parameter in QSAR. 5M	(5)

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