

# Question Paper

Exam Date & Time: 16-May-2024 (10:00 AM - 01:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

Pharmaceutical Organic Chemistry-III (Theory) [PCH-BP401T-S3]

Marks: 75

Duration: 180 mins.

### I Multiple Choice Questions (MCQs)

Answer all the questions.

Section Duration: 30 mins

- 1) Identify the correct answer with regard to 1,2,5-Oxadiazole (1)
- [It is a fully unsaturated 6 membered ring containing compound](#)
- [It is a fully saturated 6 membered ring containing compound](#)
- [It is a fully saturated 5 membered ring containing compound](#)
- [It is a fully unsaturated 5 membered ring containing compound](#)
- 2) Identify the correct statement with regard to Hantzsch-Widmann system of nomenclature. (1)
- [Applies to monocyclic three-to-five-membered ring heterocycles](#)
- [Applies to monocyclic three-to-seven-membered ring heterocycles](#)
- [Applies to monocyclic three-to-eight-membered ring heterocycles](#)
- [Applies to monocyclic three-to-ten-membered ring heterocycles](#)
- 3) Identify the correct answer with regard to order of importance of hetero atoms in nomenclature (1)
- [P, N, S,](#)
- [P, Se, S](#)
- [O, S, P](#)
- [Se, O](#)
- [P](#)
- 4) Identify the wrong statement (1)
- [Heterocyclic ring may contain more than one hetero atom](#)
- [All heterocyclic compounds follow Huckel's rule](#)
- [Heterocycles may be saturated or unsaturated.](#)
- [Heteroatom may be either similar or different in heterocycles](#)
- 5) If the name of an heterocycle ends with "ine", it indicates that it is a (1)
- [5 membered unsaturated ring containing nitrogen](#)
- [5 membered saturated ring containing nitrogen](#)
- [5 membered saturated ring without nitrogen](#)
- [6 membered saturated ring without nitrogen](#)
- 6) Identify the incorrect statement with respect to 1,2-Dimethylcyclohexane (1)

[Diequatorial substituent structure is the least stable](#)  
[It has 2 chiral centers](#)  
[There are no 1,3-diaxial interaction between methyl group and hydrogen atom](#)  
[1,2-dimethylcyclohexane shows enantiomerism](#)

7) Identify the correct statement (1)

[1,3-dimethylcyclohexane has no chiral centers](#)  
[Conformational isomers of cis-1,3-Dimethyl cyclohexane has no plane of symmetry](#)  
[1,3-dimethylcyclohexane is a meso compound](#)  
[cis- stereoisomer \(aa\) of 1,3-dimethylcyclohexane is the most stable stereoisomer](#)

8) Generally a trans isomer has (1)

[Low melting point](#)  
[High boiling point](#)  
[Low solubility](#)  
[High dipole moments](#)

9) Identify the least stable conformer of cyclohexane among the following (1)

[Half chair](#)  
[Twist Boat](#)  
[Boat](#)  
[Chair](#)

10) In case of an alkene with 2 number of carbon-carbon double bonds, ----- number of cis-trans isomers are possible. (1)

[6](#)  
[4](#)  
[3](#)  
[2](#)

11) If a molecule is rotated by an angle  $360^\circ/n$  around an axis and an arrangement similar to the original is obtained then the molecule is said to have (1)

[Plane of symmetry](#)  
[Centre of symmetry](#)  
[Alternating axis of symmetry](#)  
[Simple axis of symmetry](#)

12) The two enantiomers of glyceraldehyde were given the labels (1)

[R \(for dextro-because it was the \(+\)-enantiomer\) and S \(for laevo-because it was the \(-\)-enantiomer\)](#)  
[D \(for dextro-because it was the \(+\)-enantiomer\) and L \(for laevo-because it was the \(-\)-enantiomer\)](#)  
[D \(for dextro-because it was the \(-\)-enantiomer\) and L \(for laevo-because it was the \(+\)-enantiomer\)](#)

S (for dextro-because it was the (-)-enantiomer) and R (for laevo-because it was the (+)-enantiomer)

13) In sequence rule the group with the lowest atomic number is (1)

given lowest priority  
given Highest priority  
ignored  
unstable

14) Catalytic reduction of quinoline with tin and hydrochloric acid yields (1)

decahydroquinoline  
Dihydroquinoline  
1,2,3,4- tetrahydroquinoline  
Quinolidine

15) Chemists took .....as a standard against which the configurations of other compounds could be compared. (1)

Glyoxal  
Glyceraldehyde  
Glycol  
Glycerol

16) Caffeine is (1)

1,3-dimethyl Xanthine  
1,7-dimethyl Xanthine  
1,3,7-trimethyl Xanthine  
Xanthine  
3,7-dimethyl Xanthine

17) In acridine nucleophilic attack takes place in (1)

7th position  
8th position  
9th position  
10th position

18) Electrophiles attack indole at (1)

C-2  
C-3  
C-4  
C-5

19) Oxidation of quinoline with peracids gives (1)

quinoline-N-oxide  
quinoline aldehyde  
isonicotinic acid  
nicotinic acid

20) Indole shows .....character (1)

weakly acidic  
weakly basic  
both acidic and basic

## II Long Answers

Answer all the questions.

- 1) Explain the various elements of symmetry. Explain DL system of nomenclature of optical isomers. Give the application of optical isomers (10)
- 2) Describe the orbital picture of furan with a neat diagram. Explain two methods of preparation of pyrrole. (5)
  - A)
  - B) Define heterocycles with examples. Explain their importance with suitable examples and structures. (5)

## III Short Answers

Answer all the questions.

- 1) How will you prepare cinnamaldehyde from benzaldehyde? Explain the reaction with mechanism and application (5)
- 2) With energy diagram, compare the different conformations that are observed in case of cyclohexane (5)
- 3) Explain optical activity. How will you determine the specific rotation? (5)
- 4) Explain Clemmensen reduction and Birch reduction. Give its synthetic application (5)
- 5) Explain the physical properties and chemical reactions of acridine. Give the use of isoniazid (5)
- 6) Explain the concept of stereoselective and stereospecific reactions with suitable examples (5)
- 7) Give the synthetic route for the synthesis of a) thiazole b) pyrazole. Write the reactions involved in the a) Nitration b) halogenation of pyrazole (5)

-----End-----