

# Question Paper

Exam Date & Time: 04-Jul-2023 (02:00 PM - 05:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

Pharmaceutical Organic Chemistry - III [PCH-BP401T-S1]

Marks: 75

Duration: 180 mins.

### I Multiple Choice Questions (MCQs)

Answer all the questions.

Section Duration: 30 mins

1) Which compound is the most basic? (1)

[pyrrole](#)

[imidazole](#)

[pyrrolidine](#)

[pyridine](#)

2) Which of the following is more resonance stabilized? (1)

[furan](#)

[thiophene](#)

[pyrrole](#)

[pyridine](#)

3) One of the following heterocycle derivative can be used as anxiolytic: (1)

[diazepine](#)

[indole](#)

[acridine](#)

[quinoline](#)

4) By passing a mixture of furan, ammonia, and steam over aluminium oxide catalyst at 480-490°C, the product forms is: (1)

[thiophene](#)

[pyrrole](#)

[furan](#)

[imidazole](#)

5) One of the following heterocycles gives bright red colour when moistened with hydrochloric acid: (1)

[thiophene](#)

[pyrrole](#)

[furan](#)

[imidazole](#)

6) (1)

What kind of an isomerism exist between acetone and propionaldehyde?

[geometrical isomerism](#)

[conformational isomerism](#)

[optical isomerism](#)

[constitutional isomerism](#)

7) One of the following exhibits atropisomerism: (1)

[biphenyl-4,4' -bis-sulfonic acid](#)

[biphenyl-3,3' -bis-sulfonic acid](#)

[biphenyl-2,2' -bis-sulfonic acid](#)

[4, 4'-dinitro-biphenyl](#)

8) Non-superimposable and non-mirror images are known as: (1)

[diastereoisomers](#)

[enantiomers](#)

[optical isomers](#)

[geometrical isomers](#)

9) Which type of strain is present in gauche conformation of n-butane? (1)

[torsional strain](#)

[steric strain](#)

[both torsional and steric](#)

[strain](#)

[there is no any strain](#)

10) Which of the following is the correct list of conformations of cyclohexane in increasing order of potential energies? (1)

[boat < chair < twist boat < boat](#)

[chair < boat < half chair < twist boat](#)

[half-chair < twist-boat < boat < chair](#)

[chair < twist boat < boat < half-chair](#)

11) Purine skeleton is present in (1)

[quinine](#)

[caffeine](#)

[acridine](#)

[morphine](#)

12) . Isoquinoline has molecular formula (1)

[C<sub>10</sub>H<sub>7</sub>N](#)

[C<sub>9</sub>H<sub>7</sub>N](#)

[C<sub>6</sub>H<sub>9</sub>N](#)

[C<sub>12</sub>H<sub>9</sub>N](#)

13) Purine is synthesised from (1)

[4,5-diaminopyrimidine](#)

[maleic acid](#)

[malic acid](#)

[barbituric acid](#)

14) Resolution of racemic modification is done by (1)

[Conversion to diastereomers](#)

[Conversion to enantiomers](#)

[Conversion to supercritical liquids](#)

[Conversion to geometrical isomers](#)

15) . Conversion of a carboxylic acid to amine using hydrazoic acid is called (1)

[Aldol condensation](#)

[Dakin reaction](#)

[Claisen-Schmidt condensation reaction](#)

[Schmidt rearrangement reaction](#)

16) Geraniol is converted to citral in the presence of (1)

[quinoxaline](#)

[quercetin](#)

[quinones](#)

[quinuclidine](#)

17) The catalyst used in Berntsen acridine synthesis is (1)

[Hydrogen chloride](#)

[stannous chloride](#)

[Hydrogen fluoride](#)

[zinc chloride](#)

18) In the absence of any chiral influences when a chirality center is created as a result of a chemical reaction, the product will always be formed as a /an (1)

[liquid](#)

[racemate](#)

[enantiomer](#)

[conformer](#)

19) Pyrimidine nucleus is present in (1)

[Ibuprofen](#)

[benzimidazole](#)

[phenytoin](#)

[sulphadoxine](#)

- 20) For designating the configuration of chiral carbon atoms Cahn, Ingold and Prelog devised (1)

[Thumb rule](#)

[Schedule rule](#)

[Sequence rule](#)

[Markovnikov rule](#)

### II Long Answers

Answer all the questions.

- 1) a) Write the resonance structures of pyrrole. 2 marks (10)  
b) Compare the basicity of pyrrole and pyridine. 3 marks  
c) Explain with mechanism the EAS reactions of pyrrole. 5 marks
- 2) What are chiral and achiral molecules? Explain in detail the application of sequence rules for assigning R and S configuration. (10)

### III Short Answers

Answer all the questions.

- 1) Draw structures for the following IUPAC names: (5)  
a). 3,5-pyrazolidine-dione b). perhydro pyridine  
c). dibenzo [b,f] azepine d). 1,2-thiazole  
e). 2H pyran
- 2) Define the following terms with an example. (5)  
a) torsion angle  
b) staggered conformer  
c) steric strain  
d) sawhorse projection formula  
e) gauche conformer
- 3) Explain any one method of preparation of quinoline and indole. (5)
- 4) What is asymmetric synthesis? Explain with example. (5)
- 5) Carry out the conformational analysis of ethane. Predict the most stable conformer and justify your answer. (5)
- 6) What is Schmidt rearrangement reaction? Give its synthetic applications (5)
- 7) How will you prepare phenols from aryl aldehydes? How will you convert o-chloro benzoic acid to acridine? Explain with equations. (5)

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