

Exam Date & Time: 08-Jun-2022 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

Pharmaceutical Organic Chemistry-III [PCH-BP401T]

Marks: 75

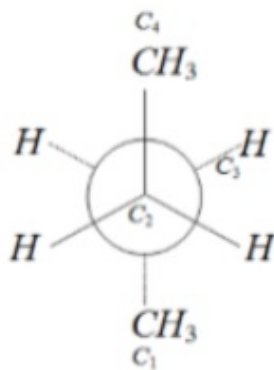
Duration: 180 mins.

I Multiple Choice Questions (MCQs)

Answer all the questions.

Section Duration: 30 mins

- 1) What is the suffix to be used for the five membered, nitrogen containing and saturated ring in IUPAC naming? (1)
- | | | | |
|---------|-----------|-------------|--------------|
| 1) -ole | 2) -oline | 3) -olidine | 4) -perhydro |
|---------|-----------|-------------|--------------|
- 2) Which one of the following is NOT an aromatic? (1)
- | | | | |
|----------|------------|-------------|---------------|
| 1) furan | 2) pyrrole | 3) pyridine | 4) piperidine |
|----------|------------|-------------|---------------|
- 3) One of the following heterocycles is a weak base (1)
- | | | | |
|------------|-------------|----------------|---------------|
| 1) pyrrole | 2) pyridine | 3) pyrrolidine | 4) piperidine |
|------------|-------------|----------------|---------------|
- 4) Which one of the five membered rings is most resonance stabilized? (1)
- | | | | |
|--------------|------------|----------|------------|
| 1) thiophene | 2) oxazole | 3) furan | 4) pyrrole |
|--------------|------------|----------|------------|
- 5) Reimer-Tiemann reaction of pyrrole gives the products (1)
- | | | | |
|--|--|--|------------------------------------|
| 1) pyrrole-2-aldehyde and 3-chloropyridine | 2) pyrrole-3-aldehyde and 3-chloropyridine | 3) pyrrole-2,3-dialdehyde and pyridine | 4) pyrrole-2-aldehyde and pyridine |
|--|--|--|------------------------------------|
- 6) One of the following is the definition of diastereoisomers: (1)
- | | | | |
|------------------------|----------------|--|---|
| 1) geometrical isomers | 2) enantiomers | 3) superimposable mirror image isomers | 4) Non-superimposable, non-mirror-image isomers |
|------------------------|----------------|--|---|
- 7) In the following n-butane conformation, C2 is rotated about C2-C3 bond anticlockwise by an angle of 180° then the conformation obtained is known as (1)



1) fully eclipsed conformation	2) partially eclipsed conformation	3) gauche conformation	4) staggered conformation
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8) Which type of strain is present in fully eclipsed conformation of n-butane?

1) torsional strain	2) steric strain	3) both torsional and steric strain	4) none of these	(1)
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9) Which of the following is the correct list of conformations of cyclohexane in increasing order of potential energies?

1) boat < chair < twist boat < boat	2) chair < boat < half chair < twist boat	3) half-chair < twist-boat < boat < chair	4) chair < twist boat < boat < half-chair	(1)
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10) Hexane and 3-methylpentane are examples for

1) enantiomers	2) diastereomers	3) cis-trans isomers	4) constitutional isomers	(1)
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11) One of the following has diuretic property

1) quinine	2) caffeine	3) acridine	4) morphine	(1)
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12) Quinoline is a heterocyclic aromatic organic compound having molecular formula

1) C ₁₀ H ₇ N	2) C ₉ H ₇ N	3) C ₆ H ₉ N	4) C ₁₂ H ₉ N	(1)
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13) Pyrimidine is synthesised from

1) picric acid	2) maleic acid	3) malic acid	4) barbituric acid	(1)
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14) One of the following is not a method of resolution of racemic modification

1) resolution by biological transition	2) Conversion to diastereomers	3) Chromatographic method using special adsorbents.	4) Mechanical Separation
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(1)

15)is used as solvent to facilitate the high temperature needed in Wolff-Kishner reduction

1) acetic acid	2) sulphuric acid	3) ethylene	4) ethylene glycol
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(1)

16) 4-tert-butylcatechol is a/an

1) polymerization activator	2) polymer	3) polymerization inhibitor	4) alcohol
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(1)

17) The catalyst used in Chichibabin pyridine synthesis is

1) manganese(II) fluoride	2) stannous chloride	3) Hydrogen fluoride	4) Iron (II) chloride
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(1)

18) . When a chirality center is created as a result of a chemical reaction, the product will always be formed as a /an in the absence of any chiral influences

1) enantiomer	2) solid	3) racemate	4) conformers
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(1)

19) sulphadoxine contains.....nucleus

1) pyrrole	2) pyrimidine	3) indole	4) pyridine
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(1)

20) The pKa of the pyridinium cation is

1) 5.25	2) 6.85	3) 7.85	4) 3.45
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(1)

II Long Answers

Answer all the questions.

- 1) Explain optical activity and R-S system of nomenclature of optical isomers. What are the biological applications of stereochemistry? (10)
- 2) a) Discuss with mechanism the EAS reactions of pyrrole. 6 marks
 b) Comment on the following regarding chemistry of Imidazole: 4 marks
 i) bromination at 2nd position of imidazole (10)
 ii) acidity and basicity
 iii) nature of the two nitrogens

III Short Answers

Answer all the questions.

- 1) Draw structures for the following IUPAC names:
 a). 3-pyrazoline b). piperidine-2,6-dione
 c). dibenzo [b,f] azepine d). benzo[b]furan (5)
 e). 4H pyran
- 2) Define the following terms with an example. (5)

a) dihedral angle b) torsional strain c) steric strain
d) Natta projection formula e) gauche conformer

- 3) Explain Beckmann rearrangement with mechanism. Give its application. (5)
- 4) Explain Partial asymmetric synthesis and absolute asymmetric synthesis with example. (5)
- 5) a) Carry out the conformational analysis of ethane. 3 marks
b) Why chair form is more stable than boat form of cyclohexane? 2 marks (5)
- 6) Explain metal hydride reduction and Wolff-Kishner reduction with application. (5)
- 7) Explain the methods of preparation and reactions of pyridine (5)

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