

Exam Date & Time: 18-Jul-2022 (10:00 AM - 01:00 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) What is the suffix to be used for the six membered, containing nitrogen and unsaturated ring in IUPAC naming?

1) -ole	2) -oline	3) -ine	4) -perhydro
---------	-----------	---------	--------------

- 2) One of the following has larger dipole moment

1) thiophene	2) pyrrole	3) furan	4) imidazole
--------------	------------	----------	--------------

- 3) The following heterocycles is strongly basic in nature:

1) pyridine	2) pyrrole	3) piperidine	4) pyrimidine
-------------	------------	---------------	---------------

- 4) Which of the following ring is more reactive than benzene towards electrophilic aromatic substitution

1) furan	2) thiophene	3) pyrrole	4) oxazole
----------	--------------	------------	------------

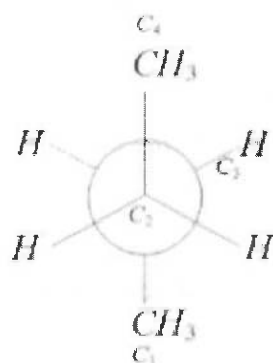
- 5) One of the following heterocycles undergo Diels-Alder reaction:

1) furan	2) pyrrole	3) thiophene	4) pyridine
----------	------------	--------------	-------------

- 6) What type of strain is present in fully eclipsed conformer of ethane molecule?

1) torsional strain	2) steric strain	3) torsional and steric strain	4) gauche interactions
---------------------	------------------	--------------------------------	------------------------

- 7) What type of conformation is present in the following n-butane structure?



1) fully eclipsed	2) partially	3) gauche	4) staggered
-------------------	--------------	-----------	--------------

conformation	eclipsed conformation	conformation	conformation
--------------	-----------------------	--------------	--------------

8) Which of the following compounds exhibit cis-trans isomerism?

1) 2-butene	2) 2-butyne	3) 2-butanol	4) 2-butanal	(1)
-------------	-------------	--------------	--------------	-----

9) One of the following notations can be used to name the geometrical isomers in oximes:

1) E & Z system	2) cis-trans system	3) syn- and anti-system	4) R & S system	(1)
-----------------	---------------------	-------------------------	-----------------	-----

10) Which of the following groups has the highest priority according to the Cahn-Ingold-Prelog sequence rules?

1) CH ₃	2) CH ₂ Cl	3) CH ₂ OH	4) CHO	(1)
--------------------	-----------------------	-----------------------	--------	-----

11) Caffeine is

1) 1, 3, 7-trimethylxanthine	2) 1, 3, 5-trimethylxanthine	3) 1, 2, 3-trimethylxanthine	4) 1, 5, 7-trimethylxanthine	(1)
------------------------------	------------------------------	------------------------------	------------------------------	-----

12) . Indole is a heterocyclic organic compound having molecular formula

1) C ₁₀ H ₇ N	2) C ₆ H ₇ N	3) C ₈ H ₇ N	4) C ₁₂ H ₉ N	(1)
-------------------------------------	------------------------------------	------------------------------------	-------------------------------------	-----

13) . Condensation reaction of formaldehyde and acetaldehyde results in

1) picoline	2) acrolein	3) simple aldol	4) crossed aldol	(1)
-------------	-------------	-----------------	------------------	-----

14) In sequence rules, when dealing with isotopes, the atom with the higher atomic mass receives

1) higher priority.	2) lower priority	3) no priority.	4) least consideration	(1)
---------------------	-------------------	-----------------	------------------------	-----

15) Pyridine undergoes alkylation

1) 2nd position	2) 3rd position	3) 4th position	4) N-centred	(1)
-----------------	-----------------	-----------------	--------------	-----

16) is one of the simplest chiral compounds in nature.

1) glycol	2) glyceraldehyde	3) glucose	4) fructose	(1)
-----------	-------------------	------------	-------------	-----

17) Purine is synthesised from

1) 4,5-diaminopyrimidine	2) maleic acid	3) 3,5-diaminopyrimidine	4) 2,3-diaminopyrimidine	(1)
--------------------------	----------------	--------------------------	--------------------------	-----

18) When *Penicillium glaucum* is allowed to grow in racemic ammonia salt, it

(1)

1)	destroys the levo compound	2)	destroys the dextro compound	3)	destroys both dextro and levo	4)	has no effect
----	----------------------------	----	------------------------------	----	-------------------------------	----	---------------

- 19) Treatment of an aldehyde or ketone with Sodium borohydride followed by protonation forms a

1)	1° amine	2)	2° amine	3)	1° or 2° alcohol	4)	2° amide
----	----------	----	----------	----	------------------	----	----------

- 20) 2-tert-butyl-4-hydroxyanisole is used as a/an

1)	preservative	2)	flavouring agent	3)	artificial sweetening agent	4)	antacid
----	--------------	----	------------------	----	-----------------------------	----	---------

II Long Answers

Answer all the questions.

- 1) a) What do you mean by Resolution of racemic modification? What are the methods of resolution of racemic modification? Explain any two methods. 5 marks (10)
 b) Explain enantiomerism and diastereomerism with examples. 5 marks
- 2) a) Explain with mechanism the EAS reactions of Furan. 6 marks
 b) Comment on the following regarding the chemistry of imidazole. 4 marks (10)
 i) 4th and 5th positions are equal
 ii) bromination takes place at 2,4, and 6th positions
 iii) nature of two nitrogen atoms are different

III Short Answers

Answer all the questions.

- 1) Draw structures for the following IUPAC names: (5)
 a). 3-imidazoline b). pyrazolidine-3,5-dione
 c). benzo [b] furan d). isonicotinamide
 e). azetidine
- 2) Explain Claisen Schmidt reaction with mechanism and application. (5)
- 3) Explain the methods of synthesis and reactions of indole (5)
- 4) a) Explain Birch reduction with application 3 marks
 b) What are chiral and achiral molecules? 2 marks (5)
- 5) What is conformational analysis? Carry out the conformational analysis of n-propane. Explain with energy diagram. (5)
- 6) Give reasons for the following: (5)
 a) Imidazole is 100 times strongly basic than pyridine
 b) 5th position is most favoured for EAS in Imidazole
 c) geometrical isomerism is not exhibited by alkanes
 d) stereochemistry is important in medicinal chemistry
 e) chair form of cyclohexane is the most stable conformation
- 7) Give any one example each for the following: (5)
 a) atropisomerism b) E & Z isomerism c) syn & anti system
 d) stereospecific e) stereoselective

-----End-----

