Question Paper

Exam Date & Time: 15-May-2024 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

B.Pharm End semester Examination May-2024

Pharmaceutical Organic Chemistry I (Theory) [PCH-BP202T-S3]

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

I Multiple Choice Questions (MCQs)

Answer all the questions. Section Duration: 30 mins

1) Which of the following is a product of nucleophilic addition with alcohols to aldehydes and ketones? (1)

- Hemiacetals
- Hydrates
- Ketones
- Amines

2) Reaction of a carbonyl compound with one of the following reagents involves nucleophilic addition followed by elimination of water. The reagent is : (1)

- Grignard reagent
- hydrazine in presence of acidic solution
- hydrocyanic acid
- sodium hydrogen sulphite

3) Which of the following statements is incorrect for aldol condensation reaction? (1)

- The first step is deprotonation at the α-Hydrogen position
- An aldol reaction occurs between two aldehydes or ketones, and at least one reactant must contain an α-Hydrogen atom
- The product of an aldol reaction between two aldehydes is a β-diketone
- An aldol reaction is a C-C bond-forming reaction

4) Which of the reactions below can result in ketones? (1)

- Oxidation of primary alcohols
- Oxidation of secondary alcohols
- Dehydrogenation of tertiary alcohols
- Dehydrogenation of primary alcohols

5) Which of the following compounds has highest reactivity in nucleophilic addition reaction ? (1)

- propanone
- methanal
- ethanal
- butanone

6) What is the correct order of reactivity of the following towards nucleophilic addition? (1)

- Methanal > Ethanal > Acetone

Acetone > Ethanal > Methanal

Methanal > Acetone > Ethanal

Ethanal > Methanal > Acetone

7) What are the products of the Cannizzaro reaction? (1)

A carboxylic acid and an alcohol

A new aldehyde (with a new 'R' group) and water

Two carboxylic acids

A carboxylic acid and an aldehyde

8) How many structural isomers are possible for C3H9N? (1)

4

2

5

3

9) The nitrogen atom of the amino group is ..... hybridised (1)

sp

sp2

sp3

sp3d

10) Which of the following is an example of a primary amine? (1)

Methyl amine

Diphenylamine

Trimethyl amine

Diethyl amine

11) Which of the following statements applies to the E2 mechanism? (1)

It occurs with inversion of stereochemistry.

It occurs with racemization of stereochemistry.

It proceeds through the more stable carbocation intermediate.

The C-H and C-X bonds that break must be anti.

12) Which alkyl halide has the highest reactivity for a particular alkyl group? (1)

R-F

R-Cl

R-I

R-Br

13) In the addition of HX to a double bond, the hydrogen goes to the carbon that already has more hydrogens is a statement of (1)

Hund's rule

Markownikoff's rule

Huckel rule

Saytzeff's rule

14) Why alkyl halides are considered to be very reactive compounds towards nucleophile? (1)

they have an electrophilic carbon & a bad leaving group
they have a nucleophilic carbon & a good leaving group
they have an electrophilic carbon
they have an electrophilic carbon & a good leaving group

15) Which compound is least acidic? (1)

FCH2CO2H
ClCH2CO2H
BrCH2CO2H
ICH2CO2H

16) Aspirin is an acetylation product of (1)

O-hydroxybenzoic acid
O-dihydroxybenzene
m-hydroxybenzoic acid
p-dihydroxybenzene

17) When two moles of ethyl chloride react with two moles of sodium in the presence of ether what will be formed? (1)

2 moles of ethane
1 moles of ethane
2 moles of butane
1 moles of butane

18) Freon 12(CCl2F2) is used as a (1)

Local anaesthetic
Drycleaning agent
Refrigerant
Disinfectant

19) Lucas test is used to determine the type of (1)

alcohols
acids
amines
carbohydrates

20) Which of the following will give Ethanoic acid on acid hydrolysis? (1)

Ethyl acetate
Methyl propionate
Acetone
Lactic acid

II Long Answers

Answer all the questions.

1) A. Explain five types of isomerism with suitable examples. (10)

B. Give the structure for the following IUPAC names.
3-Chloro-2-methyl butanoic acid
3-Iodo Heptane
3-methyl-4-bromo pent-2-ene

1,1 -dimethyl cyclohexane
3-ethyl-4, 4-dimethylheptane. (5+5=10 Marks)

2) A. What are elimination reactions? Explain the mechanism of E1 and E2 reactions 7 Marks (10)
B. What type of hybridization is shown by alkanes? write the orbital structure of methane 3 Marks

III Short Answers

Answer all the questions.

1) What is Benzoin condensation? Explain the mechanism with a suitable example. (5)

2) Write the structure and use for the following compounds. (5)
a. Farmaldehyde b. Cinnamaldehyde c. Benzaldehyde d. Acetonee. e. Vanillin

3) Compare the basicity of aliphatic and aromatic amines with suitable illustrations. (5)

4) Write any three preparation methods for primary amines. Explain carbylamine test for primary aromatic amines. (5)

5) Explain the reactions of alkyl halide with metals (5)

6) Write the preparations of primary, secondary, and tertiary alcohol from Grignard reagent (5)

7) Write the structure IUPAC name and medicinal uses for the following compounds (5)
Iodoform, Chlorobutanol, amphetamine, and Aspirin

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