

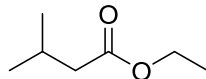
Duration: 3 Hours

Total marks: 75

- N.B.:** 1. All questions are compulsory
2. Figures to right indicate full marks

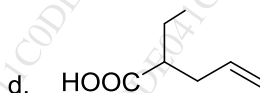
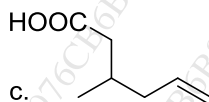
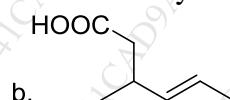
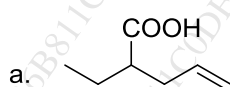
Q. 1 Choose appropriate option for following multiple choice based questions. **20**

1 What is the IUPAC Name for the following compound?



- a ethyl propanoate
b 3-methylbutane ethanoate
c ethyl 3-methylbutanoate
d 2-methylbutane ethanoate

2 Identify the correct structure for 3-methylhex-5-enoic acid



- a a
b b
c c
d D

3 But-1-en-1-amine can exhibit.....

- a Imine enamine tautomerism
b Keto-enol tautomerism
c Chain isomerism
d Metamerism

4 Which of the following statement is incorrect for ethanoic acid and methyl methanoate

- a Both compounds have the molecular formula $C_2O_2H_4$
b These compounds exhibit metamerism
c These compounds exhibit functional isomerism
d These compounds have different chemical properties.

5 Select correct IUPAC nomenclature for β -methyl- β -phenylbutyraldehyde.

- a 2-methyl-2-phenylbutanal
b 3-methyl-3-phenylbutanal
c 2-methyl-2-phenylpropanal
d 3-methyl-3-phenylbutaraldehyde

- 6 Paraffin waxes are graded by its
- a melting point
 - b specific gravity
 - c ductility
 - d Viscosity
- 7 In the chlorination of alkanes the first step in which chlorine free radicals are produced is called
- a initiation
 - b activation
 - c propagation
 - d Deactivation
- 8 Why isotope effect is observed in E2 reaction?
- a because it is bi molecular reaction
 - b because it is second order reaction
 - c because breaking of B carbon-hydrogen occur in rate determining step
 - d none of these
- 9 Propene reacts with HBr in presence of peroxide to give
- a n propyl bromide
 - b alkyl bromide
 - c isopropyl bromide
 - d vinyl bromide
- 10 Which of the following is the rate -limiting step for the hydrolysis of tertiary-butyl bromide?
- a loss of water from the carbocation
 - b dissociation of the alkyl halide into a carbocation and bromide ion
 - c addition of water to the carbocation
 - d reaction of the carbocation with the bromide ion
- 11 Which of the following statements regarding the S_N2 mechanisms is wrong?
- a It has a one-step mechanism
 - b It has unimolecular rate-determining transition state
 - c It does not involve carbocation rearrangement
 - d Primary alkyl halides are more reactive than tertiary alkyl halides.
- 12 Which one of the following alcohols cannot be oxidized to carbonyl compound?
- a 3-methyl-3-pentanol
 - b Propanol
 - c 2-butanol
 - d 2-pentanol
- 13 Which of the following solvents is preferred for bimolecular nucleophilic substitution reaction?
- a DMSO
 - b Water
 - c Ethanol
 - d Methanol

- 14 Which of the following reagents will react with both aldehydes & ketones?
a Grignard reagent
b Tollen's reagent
c Fehling's reagent
d Benedict's reagent
- 15 The carbon atom of a carbonyl group is
a sp hybridised
b sp² hybridised
c sp³ hybridised
d None
- 16 Which of the following does not give Aldol condensation reaction?
a Formaldehyde
b Acetyldehyde
c Dimethyl ketone
d Propionaldehyde
- 17 Perkin reaction is a _____ reaction
a Neutralization
b Condensation
c Hydrolysis
d Acid-base
- 18 Amides can be converted to amines by a reaction named after
a Hoffmann Bromamide
b Claisen condensation
c Perkin condensation
d Kekule
- 19 Which of the following compound is expected to be most basic?
a Aniline
b Methylamine
c Hydroxylamine
d Ethylamine
- 20 _____ is commonly used as a food preservative
a Sodium benzoate
b Potassium benzoate
c Terephthalic acid
d Acetic acid

Q. 2 Answer any TWO questions

20

1. a) An organic Compound (A) on Ozonolysis gives acetone and formaldehyde. What is the Structure of (A)? Write the complete mechanism for this reaction.
b) When 2-Chloro, 3,3 dimethyl butane is heated with ethanol. Predict all the possible product/s. Identify Major and Minor products and justify. Comment on the factors affecting this reaction.

10

2. a) Following is the list of four halides. Select correct sequence of decreasing order of reactivity for S_N1 reaction. Justify the order and explain the mechanism for most reactive compound. $C_6H_5CH(CH_3)Br$, $C_6H_5CH(CH_3)I$, $C_6H_5CH_2I$, $C_6H_5CH_2Br$. **10**
 b) With suitable examples discuss and differentiate the stereochemistry of S_N1 and S_N2 reactions.
3. a) An organic compound with a molecular formula $C_9H_{10}O$ forms a 2, 4-DNP derivative, reduces Tollen's reagent and undergoes Cannizzaro's reaction. On rigorous oxidation, it gives 1, 2- Benzene dicarboxylic acid. Identify the compound. **10**
 b) Explain Aldol Condensation in detail.
- Q.3 Answer any SEVEN questions **35****
1. Give the products for the following. **5**
 1. Acetone + Phenyl hydrazine
 2. Acetaldehyde + Semicarbazide
 3. Benzaldehyde+ 2,4-dinitrophenylhydrazine
 4. Acetone +Hydroxylamine
 5. Acetaldehyde + Ethyl magnesium bromide
2. Arrange the given molecules in increasing order of basicity in both solution phase and gaseous phase and justify the order. N,N-dimethyl ethanamine, ethanamine, N-methyl ethanamine **5**
3. A. Draw a structures for the following compounds. (Any 3) **5**
 1. hexane-2,4-dione
 2. 3-fluoro-2-methylpropanal
 3. 2-bromo-4-ethyl-3-methoxyheptane
 4. Benzoic ethanoic anhydride
 B. Draw the structures of the tautomer for 3-pentanone and cyclohexanone.
4. Name the reaction when tert-butyl alcohol reacts with hydrogen bromide. Predict the product/s this reaction. Comment on the oxidation of alcohol. **5**
5. Give the name of reagents to carry out following conversions. **5**
 1. 3,3-dimethyl-2butanol to 2,3-dimethyl-2-butene
 2. 1-methyl-1-cyclohexanol to 1-chloro-1-methyl cyclohexane
 3. 2-bromohexane to 2-hexene
 4. Propene to 2-bromopropane
 5. Ethyl bromide to ethyl alcohol
6. What is Hyperconjugation? Explain the stabilities of alkenes based on it. **5**
7. Write a note on halogenation of alkanes and elaborate on reactivity verses selectivity using suitable halogens. **5**
8. Give simple chemical tests to distinguish between the following (1) Propanal & Propanone (2) Acetophenone & Benzophenone **5**
9. Explain the factors affecting the acidity of Carboxylic acids. Write the structures & uses of (1) Tartaric acid (2) Salicylic Acid **5**
