CHEMISTRY

BOOKS - FULL MARKS CHEMISTRY (TAMIL ENGLISH)

FUNDAMENTALS OF ORGANIC CHEMISTRY

Example Problems

1. Classify the following compounds based on the structure

(i) $CH \equiv C - CH_2 - C \equiv CH$

(ii) $CH_3 - CH_2 - CH_2 - CH_2 - CH_3$

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2. 0.26 g of an organic compound gave 0.039 g of water and 0.245 g of carbon dioxide on combustion. Calculate the percentage of C & H.

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3. In an estimation of sulphur by Carius method, 0.2175 g of the substance gave 0.5825 g of $BaSO_4$, calculate the percentage composition of S in the compound.

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4. 0.24 g of an organic compound gave 0.287 g of AgCl in the carius method. Calculate the percentage of chlorine in the compound.

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5. 0.24 g of organic compound containing phosphorous gave 0.66 g of $Mg_2P_20_7$ by the usual analysis. Calculate the percentage of phosphorous in the compound

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6. 0.1688 g when analysed by the Dumas method yield 31.7 mL of moist nitrogen measured at $14^\circ C$ and 758 mm mercury pressure. Determine the $\%$ of N in the substance (Aqueous tension at $14^\circ C = 12mm$ of Hg).

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7. 0.6 g of an organic compound was Kjeldhalised and NH_3 evolved was absorbed into 50 ml of semi-normal solution of H_2SO_4 . The residual acid solution was diluted with distilled water and the

volume made up to 150 ml. 20 mL of this diluted solution required 35 mL of $\frac{N}{20}$ NaOH solution for complete neutralisation. Calculate the % of N in the compound.

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Textual Evaluation Solved Multiple Choice Questions

1. Select the molecule which has only one π bond.

A. $CH_3 - CH = CH - CH_3$

B. $CH_3 - CH = CH - CHO$

C. $CH_3 - CH = CH - COOH$

D. All of these

Answer: A

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2. In the hydrocarbon $\overset{7}{C}H_3 - \overset{6}{C}H_2 - \overset{5}{C}H = \overset{4}{C}H - \overset{3}{C}H_2 - \overset{2}{C} \equiv \overset{1}{C}H$ the state of hybridisation of carbon 1,2,3,4 and 7 are in the following sequence.

A. sp, sp, sp^3, sp^2, sp^3

B. $sp^2, sp, sp^3, sp^2, sp^3$

C. sp, sp, sp^2, sp, sp^3

D. none of these

Answer: A

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3. The general formula for alkadiene is ..... .

A. C_nH_{2n}

B. C_nH_{2n-1}

C. C_nH_{2n-2}

D. C_nH_{n-2}

Answer: C

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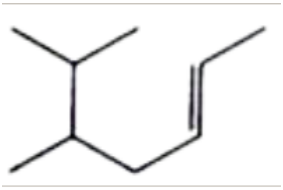
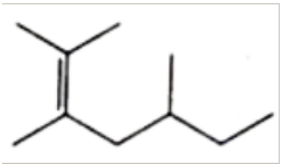
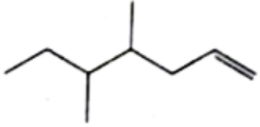
4. Structure of the compound whose IUPAC name is 5, 6-dimethylhept-2-ene is ..... .

A. 

B. 

C. 

D. none of these

Answer: A

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5. Which one of the following is not true?

A. 3 - Methyl - 3 -hexanone

B. 4-Methyl -3-hexanone

C. 3-Methyl-3-hexanol

D. 2-Methyl cyclo hexanone.

Answer: A

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6. The common name of $CH_3 - CH = CH - CHO$

A. Pent - 4-yn-2-ene

B. Pent-3-en-l-yne

C. pent-2-en-4-yne

D. Pent-1-yn-3-ene

Answer: B

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7. IUPAC name of $CH_3 - \underset{\underset{C_2H_5}{|}}{\overset{\overset{H}{|}}{C}} - \underset{\underset{CH_3}{|}}{\overset{\overset{C_4H_9}{|}}{C}} - CH_3$ is ..... .

A. 3, 4, 4 - Trimethylheptane

B. 2 - Ethyl-3, 3-dimethyl heptane

C. 3, 4,4 - Trimethyloctane

D. 2-Butyl-2-methyl-3-ethyl-butane.

Answer: C

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8. IUPAC name of $H_3C - \underset{\underset{CH_3}{|}}{\overset{CH_3}{|}}{C} - CH = C(CH_3)_2$ is ..... .

A. 1) 2, 4, 4 - Trimethylpent-2-ene

B. 2) 2, 4, 4-Trimethylpent-3-ene

C. 3) 2, 2, 4 - Trimethylpent-3-ene

D. 4) 2, 2, 4 - Trimethylpent-2-ene

Answer: A

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9. The IUPAC name of the compound $CH_3 - CH = \underset{\underset{CH_2 - CH_2 - CH_3}{|}}{C} - CH_2 - CH_3$ is ..... .

A. 1) 3 - Ethyl-2-hexene

B. 2) 3 - Propyl -3-hexene

C. 3) 4-Ethyl - 4 -hexene

D. 4) 3 - Propyl-2-hexene

Answer: A

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10. The IUPAC name of the compound $CH_3 - \underset{\underset{OH}{|}}{CH} - COOH$ is ..... .

A. 2 - Hydroxypropionic acid

B. 2-Hydroxy Propanoic acid

C. Propan-2-o1-1-oic acid

D. 1 - Carboxyethanol

Answer: B

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11. The structure of isobutyl group in an organic compound is .....

.

A. 1) $CH_3 - CH_2 - CH_2 - CH_2 -$

B. 2) $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}$

C. 3) $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH_2 -$

D. 4) $CH_3 - \underset{|}{CH} - CH_2 - CH_3$

Answer: C

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12. The number of vertebrates is ...

A. 1

B. 2

C. 3

D. 4

Answer: C

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13. Which of the following is true?

A. 3 - Chloropentane

B. 2-Chloropropane

C. Meso-tartaric acid

D. Glucose

Answer: D

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14. The isomer of ethanol is ..... .

A. acetaldehyde

B. dimethylether

C. acetone

D. methyl carbinol

Answer: B

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15. How many structural isomers are possible for the molecular formula C_4H_8 which can undergo ozonolysis?

A. 4

B. 5

C. 9

D. 10

Answer: C

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16. Which one of the following shows functional isomerism?

A. ethylene

B. Propane

C. ethanol

D. CH_2CI_2

Answer: C

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17. $CH_3 - CH_2 - CHO$ and $CH_3 - \underset{\underset{O}{||}}{C} - CH_3$ are called ..... .

A. resonating structure

B. tautomers

C. optical isomers

D. conformers

Answer: B

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18. Nitrogen detection in an organic compound is carried out by Lassaigne's test. The blue colour formed is due to the formation of ..... .

A. $Fe_3\left[Fe(CN)_6\right]_2$

B. $Fe_4\left[Fe(CN)_6\right]_3$

C. $Fe_4\left[Fe(CN)_6\right]_2$

D. $Fe_3\left[Fe(CN)_6\right]_3$

Answer: B

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19. Lassaigne's test for the detection of nitrogen fails in ..... .

A. $H_2N - CO - NH.NH_2.HCl$

B. $NH_2 - NH_2.HCl$

C. $C_6H_5 - NH - NH_2.HCl$

D. $C_6H_5CONH_2$

Answer: C

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20. Connect pair of compounds which give blue colouration/precipitate and white precipitate respectively, when their Lassaigne's test is separately done.

A. NH_2NH_2HCl and $ClCH_2 - CHO$

B. NH_2CSNH_2 and $CH_3 - CH_2Cl$

C. NH_2CH_2COOH and NH_2CONH_2

D. $C_6H_5NH_2$ and $ClCH_2 - CHO$

Answer: D

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21. Sodium nitropruside reacts with sulphide ion to give a purple colour due to the formation of ...

A. A) $\left[Fe(CN)_5NO\right]^{3-}$

B. B) $\left[Fe(NO)_5CN\right]^{+}$

C. C) $\left[Fe(CN)_5NOS\right]^{4-}$

D. D) $\left[Fe(CN)_5NOS\right]^{3-}$

Answer: C

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22. An organic compound weighing 0.15 g gave on carius estimation, 0.12 g of silver bromide. The percentage of bromine in the compound will be close to ..... .

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23. A sample of 0.5g of an organic compound was treated according to Kjeldahl's method. The ammonia evolved was absorbed in 50 mL of 0.5M H_2SO_4 . The remaining acid after neutralisation by ammonia consumed 80 mL of 0.5 M NaOH, The percentage of nitrogen in the organic compound is ..... .

A. 0.14

B. 0.28

C. 0.42

D. 0.56

Answer: B

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24. In an organic compound, phosphorus is estimated as ..... .

A. $Mg_2P_2O_7$

B. $Mg_3(PO_4)_2$

C. H_3PO_4

D. P_2O_5

Answer: A

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25. Ortho and para-nitro phenol can be separated by

A. azeotropic distillation

B. destructive distillation

C. steam distillation

D. cannot be separated

Answer: C

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26. The purity of an organic compound is determined by ..... .

A. Chromatography

B. Crystallisation

C. melting or boiling point

D. both (a) and (c)

Answer: D

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27. A liquid which decomposes at its boiling point can be purified by

A. A)distillation at atmospheric pressure

B. B)distillation under reduced pressure

C. C)fractional distillation

D. D)steam distillation

Answer: B

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Textual Evaluation Solved I Multiple Choice Questions

1. Assertion: $CH_3 - \underset{\underset{COOC_2H_5}{|}}{C} = CH - COOH$ is 3-carbethoxy -2-butenoicacid.

Reason: The principal functional group gets lowest number followed by double bond (or) triple bond.

A. both the assertion and reason are true and the reason is the correct explanation of assertion

B. both the assertion and reason are true and the reason is not the correct explanation of assertion

C. assertion is true but reason is false

D. both the assertion and the reason are false

Answer: A

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Textual Evaluation Solved Ii Short Answer Questions

1. Write the characteristics of organic compounds.

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2. Describe the classification of organic compounds based on their structure.

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3. Write a note on homologous series.

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4. What is meant by a functional group? Identify the functional group in the following compounds

(a) acetaldehyde (b) oxalic acid (c) dimethyl ether (d) methylamine

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5. Give the general formula for the following classes of organic compounds

(a) Aliphatic monohydric alcohol (b) Aliphatic ketones (c) Aliphatic amines.

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6. Write the molecular formula of the first six members of homologous series of nitro- alkanes

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7. Write the molecular and possible structural formula of the first four members of homologous series of carboxylic acids.

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8. Give the IUPAC names of the following compounds.

(i) $(CH_3)_2CH - CH_2 - CH(CH_3) - CH(CH_3)_2$ (ii)

$$CH_3 - \underset{\underset{CH_3}{|}}{CH} - \underset{\underset{Br}{|}}{CH} - CH_3$$

(iii) $CH_3 - O - CH_3$ (iv) $CH_3 - CH_2 - \underset{\underset{OH}{|}}{CH} - CHO$

(v) $CH_2 = CH - CH = CH_2$ (vi) $CH_3 - C \equiv \underset{\underset{Cl}{|}}{CH} - CH_3$

(vii) 

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9. Draw the structure of (i) 1-ethyl-2-methyl cyclopentane (ii) 1-ethyl-2, 3-dimethyl cyclohexane (iii) 5-ethyl-2-methylcyclohex-1-ene

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10. Describe the reactions involved in the detection of nitrogen in an organic compound by Lassaigne method.

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11. Give the principle involved in the estimation of halogen in an organic compound by Carius method.

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12. Give a brief account of Kala-azar.

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13. Explain the step involved in paper chromatography .

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14. Explain various types of constitutional isomerism (structural isomerism) in organic compounds.

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15. Describe optical isomerism with suitable example.

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16. Explain the isomerism exhibited by alkenes.

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17. 0.30 g of a substance gives 0.88 g of carbon dioxide and 0.54 g water. Calculate the percentage of carbon and hydrogen in it.

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18. The ammonia evolved form 0.20 g of an organic compound by kjeldahl method neutralised 15ml of $N/20$ Sulphuric acid solution. Calculate the percentage of Nitrogen.

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19. 0.316 g of an organic compound, after heating with fuming nitric acid and barium nitrate crystals in a sealed tube gave 0.466 g of the precipitate of barium sulphate. Determine the percentage of

sulphur in the compound.

(Atomic masses : Ba = 137, S = 32, O = 16, C = 12, H = 1).

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20. 0.24 g of an organic compound gave 0.287 g of AgCl in the carius method. Calculate the percentage of chlorine in the compound.

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21. In the estimation of nitrogen present in an organic compound by Dumas method 0.35 g yielded 20.7 mL of nitrogen at $15^{\circ}C$ and 760 mm Hg pressure. Calculate the percentage of nitrogen in the compound.

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In Text Questions Evaluate Yourself

1. Give two examples for each of the following type of organic compounds.

(i) non-benzonoid aromatic, (ii) aromatic heterocyclic, (iii) alicyclic and (iv) aliphatic open chain.

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2. Write structural formula for the following compounds

(i) Cyclohexa-1, 4-diene (ii) Ethynyl cyclohexane

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3. Write structural formula for the following compounds

(i) m-dinitrobenzene (ii) p-dichlorobenzene (iii) 1,3, 5-Trimethylbenzene

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4. Write all possible isomers with the molecular formula $C_4H_{10}O$ and name them.

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5. 0.2346 g of an organic compound containing C, H & 0, on combustion gives 0.2754 g of H_20 and 0.4488 g CO_2 . Calculate the % composition of C, H & 0 in the organic compound.

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6. 0.16 g of an organic compound was heated in a carius tube and H_2SO_4 acid formed was precipitated with $BaCl_2$. The mass of $BaSO_4$ was 0.35 g. Find the percentage of sulphur.

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7. 0.185 g of an organic compound when treated with Conc. HNO_3 and silver nitrate gave 0.320g of silver bromide. Calculate the % of bromine in the compound.

(Ag=108, Br=80).

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8. 0.40 g of an iodo-substituted organic compound gave 0.235 g of AgI by carius method. Calculate the percentage of iodine in the compound. (Ag = 108, I = 127).

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9. 0.33g of an organic compound containing phosphorous gave 0.397 g of $Mg_2P_20_7$ by the analysis. Calculate the percentage of P in the compound.

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10. 0.3 g of an organic compound on Kjeldahl's analysis gave enough ammonia to just neutralise 30 mL of 0.IN H_2SO_4 . Calculate the percentage of nitrogen in the compound.

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Additional Questions Solved I Choose The Correct Answer

1. Atoms of the same element may have different _____.

A. Statement 1 & 2 are correct and statement 2 is the correct explanation of statement 1.

B. Statement 1 & 2 are correct but statement 2 is not the correct explanation of statement 1.

C. Statement 1 is correct but statement 2 is wrong.

D. Statement 1 is wrong but statement 2 is correct.

Answer: A

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2. Which of the following is not organic compound?

A. DNA

B. Lipid

C. Glycogen

D. Bronze

Answer: D

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3. Which of the following is an example of an organic reaction?

A. Rusting of iron

B. Combustion of magnesium

C. Biochemical reactions

D. All the above

Answer: C

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4. Which of the following is an example of heterocylic aromatic compound?

A. THF

B. Cyclopropane

C. Pyridine

D. Azulene

Answer: C

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5. Which of the following is an example of non-benzenoid aromatic compound?

A. Toluene

B. Phenol

C. Benzyl alcohol

D. azulene

Answer: D

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6. Which of the following is an example of a metal?

A. Benzene, Toluene

B. Cyclopropane, Cyclobuane

C. Pyridine, Pyrrole

D. Propane, Butane

Answer: A

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7. Which of the following is an example of carbocyclic alicyclic compound?

A. Pyrrole

B. Thiophene

C. Cyclopropane

D. Phenol

Answer: C

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8. Which one of the following is the functional group of ketone?

A. -CHO

B. $-\underset{\underset{O}{||}}{C}-$

C. -O-

D. -OH

Answer: B

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9. Which one of the following is true?

A. -NC

B. -NCS

C. -SCN

D. -NCO

Answer: B

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10. Which of the following represent thiol?

A. -SH

B. -OH

C. -SR

D. -SCN

Answer: A

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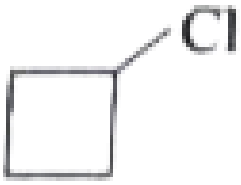
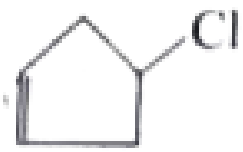
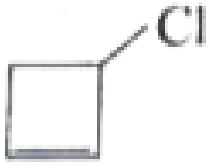
11. Which structure is named as 3-chlorocyclobut-1-ene?

A. 

B. 

C. 

D. 

Answer: C

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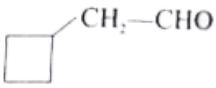
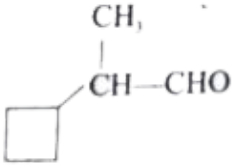
12. Which one of the following is called 2-cyclobutylpropanal?

A. 

B. 

C. $CH_2 = CH - CH = CH_2$

D. $CH_3 - CH_2 - CH_2 - CHO$

Answer: B

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13. Which one of the following is called cyclopentylbenzene?

A. 

B. 

C. 

D. 

Answer: C

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14. Which one of the following is true?

A. 

B. 

C. 

D. 

Answer: A

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15. Which one of the following is called benzylchloride?

A. $C_6H_5CH_2Cl$

B. $C_6H_5CHCl_2$

C. $C_6H_5CCl_3$

D. C_6H_5Cl

Answer: A

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16. Which of the following are non functional in human beings?

A. methyl propyl ether and diethyl ether

B. 2-pentanone & 3-pentanone

C. propanoic acid and methyl acetate

D. 1-butanol and 2-butanol

Answer: C

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17. Which one of the following shows geometrical isomerism?

A. Glucose

B. Tartaric acid

C. Lactic acid

D. Methane

Answer: D

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18. Which metal is used to prepare Lassaigne's extract?

A. Copper

B. Sodium

C. Aluminium

D. Iron

Answer: B

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19. Which colour is formed in the Lassaigne's test for nitrogen?

A. A)purple

B. B)Black

C. C)Prussian blue

D. D)Violet

Answer: C

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20. Which one of the following is called ferric ferrocyanide?

A. A) $Na_4\left[Fe(CN)_6\right]$

B. B) $Na_4\left[Fe(CN)_6\right]_3$

C. C) $Fe_4\left[Fe(CN)_6\right]$

D. D) $Fe_4\left[Fe(CN)_6\right]_3$

Answer: D

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21. Which colour is formed in the Lassaigne's test for nitrogen?

A. Prussian blue colour

B. Blood red colour

C. Purple colour

D. Canary yellow colour

Answer: B

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22. Which one of the following is the formula of sodium nitroprusside?

A. A) $Na_4\left[Fe(CN)_5NO_5\right.$

B. B) $Na_2\left[Fe(CN)_5NO\right]$

C. C) $Na_4\left[Fe(CN)_6\right]$

D. D) $Fe_4\left[Fe(CN)_6\right]_3$

Answer: A

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23. Identify the colour formed when Lassigne's extract of sulphur containing organic compound is mixed with sodium nitroprusside solution?

A. Prussian blue

B. Black

C. Green

D. Purple

Answer: D

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24. Which one of the following solutions are added to Lassaigne's extract to identify halogens?

A. Acetic acid + Lead acetate

B. dil $HNO_3 + AgNO_3$

C. $Fe(OH)_2 + FeCl_3$

D. $Na_2CO_3 + KNO_3$

Answer: B

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25. Which one of the following is not identified by Lassaigne's test?

A. a)nitrogen

B. b)sulphur

C. c)halogens

D. d)phosphorous

Answer: D

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26. Which one of the following test is used to detect phosphorous in an organic compound?

A. a)Silver nitrate test

B. b)Copper oxide test

C. c)Ammonium molybdate test

D. d)Lassaigne's test

Answer: C

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27. Identify the colour formed in the test for phosphorous using ammonium molybdate.

A. Crimson red colour

B. Deep violet colour

C. Prussian blue colour

D. Canary yellow colour

Answer: D

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28. Which of the following subtances will absorb more hert energy?

A. Conc. H_2SO_4

B. KOH

C. HCl

D. Copper

Answer: B

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29. Which of the following is used as food?

A. Potash

B. Soda

C. Conc. H_2SO_4

D. Na_2CO_3

Answer: C

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30. Which method is used to estimate sulphur?

A. Lassaigne's test

B. Oxide test

C. Carius method

D. Kjedahl's method

Answer: C

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31. Which method is used to estimate sulphur?

A. Dumas method and Kjeldahl's method

B. Carius method & Oxide method

C. Lassaignes test & Copper oxide test

D. Ammonium molybdate test & Silver nitrate test

Answer: A

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32. Which of the following is not true?

A. Camphor

B. Benzoic acid

C. Naphthalene

D. Nitrobenzene

Answer: D

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33. Which of the following is used to visualize live cells?

A. Chlorine

B. Bleaching powder

C. Animal charcoal

D. Iodine

Answer: C

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34. Which method is used to prepare metal sols?

A. Crystallization

B. Sublimation

C. Steam distillation

D. Differential extraction

Answer: C

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35. Which of the following is used as adsorbent?

A. silica gel and alumina

B. glass wool and cotton

C. glass plate and paper

D. glucose and fructose

Answer: A

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36. Which of the following compounds gives prussian blue colour in Lassaigne's test?

A. CH_4 and CH_3OH

B. CH_3NH_2 and CH_3NO_2

C. CH_3Cl and $CHCl_3$

D. CH_3CHO and CH_3COCH_3

Answer: B

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37. Which of the following compounds gives curdy white precipitate in Lassaigne's test?

A. CH_3Br

B. C_2H_5I

C. CH_3Cl

D. $C_6H_5NO_2$

Answer: C

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38. Which one of the following is not used as an adsorbent in chromatography?

A. Alumina

B. Silica gel

C. Magnesia

D. Sucrose

Answer: D

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39. The IUPAC name of $\overset{3}{C}H_3 - \underset{\underset{CH_2CH_3}{|}}{\overset{2}{C}H} - \overset{1}{C}HO$

A. a)2-methyl butanal

B. b)butan-2-aldehyde

C. c)2-ethylpropanal

D. d)3-methyl isobutraldehyde

Answer: C

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40. Which of the following compounds will exhibit cis-trans isomerism?

A. 2-Butene

B. 2-Butyne

C. 1-Butene

D. 2-Butanol

Answer: A

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41. Which of the following is not organic compound?

A. Urea

B. Thiourea

C. Benzoic acid

D. Aniline

Answer: B

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42. Which of the following reagent is used to distinguish between halogens (CI, Br, I) in an organic compound?

A. NaOH

B. $FeCl_3$

C. H_2SO_4

D. NH_4OH

Answer: D

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43. In which of the following, functional group isomerism is not possible?

A. Alcohols

B. Aldehydes

C. Alkyl halides

D. Cyanides

Answer: C

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44. Which one of the following is used as a bleach?

A. Petroleum ether

B. $CaCO_3$

C. Activated charcoal

D. Ethanoic acid

Answer: B

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45. Which of the following compounds gives prussian blue colour in Lassaigne's test?

A. $C_6H_5NH_2$

B. $NH_2 - \underset{\underset{O}{||}}{C} - NH_2$

C. $C_6H_5CONH_2$

D. C_6H_5COCl

Answer: D

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46. Which one of the following shows geometrical isomerism?

A. n-Butane

B. 1-butene

C. 2-butene

D. butyne

Answer: C

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47. Which one of the following shows functional isomerism?

A. Ethene

B. Acetone

C. Ethane

D. Propane

Answer: B

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48. Which of the following pair gives curdy white precipitate and yellow precipitate respectivety in their Lassaignes test?

A. C_2H_5I and C_2H_5Br

B. $C_2H_5NO_2$ and $C_2H_5NH_2$

C. C_6H_5Cl and CH_3I

D. CH_4 and CH_3OH

Answer: C

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Additional Questions Solved Iii Fill In The Blanks

1. What type of transpiration is possible in the xerophyte Opuntia ?

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2. When sodium acetate is added to acetic acid, the degree of ionisation of acetic acid .....

Watch Video Solution

3. Factor hypothesis was proposed by .....

Watch Video Solution

4.  is an example of ..... .

View Text Solution

5. 2-butene is an example of ..... compound.

Watch Video Solution

6. The IUPAC name of $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_2 - CH_2 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_2}{|}}{CH}} - CH_3$ is

..... .

View Text Solution

7. The IUPAC name of

$CH_3 - CH_2 - \underset{CH_2 - CH_2 - CH_3}{\overset{\overset{CH_3}{|}}{\underset{|}{C}}} - \overset{\overset{C_2H_5}{|}}{CH} - CH_2 - CH_3$ is ..... .

View Text Solution

8. The name of  is ..... .

View Text Solution

9. The name of 

View Text Solution

10. The name of  is ..... .

View Text Solution

11. Isopentane and neopentane are the examples for ..... .

Watch Video Solution

12. $CH_3 - CH_2 - CHO$ and $CH_3 - \underset{\underset{O}{||}}{C} - CH_3$ are called ..... .

Watch Video Solution

13. Copper oxide test is used to detect ..... .

Watch Video Solution

14. The formula of ferric sulphocyanide is ..... .

Watch Video Solution

15. In Lassaigne's test for halogens, if colour of the precipitate is curdy white, the halogen present is ..... .

Watch Video Solution

16. The formula of ammonium phospho molybate is ..... .

Watch Video Solution

17. Silver nitrate test is used to detect the presence of ..... .

Watch Video Solution

18. During the estimation of carbon and hydrogen, presence of nitrogen can be avoided by using ..... .

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19. In Carius method, the sulphur in an organic compound is oxidised to ..... .

Watch Video Solution

20. The method used to estimate nitrogen in foods and fertilisers is ..... .

View Text Solution

21. The mixture of diethyl ether and ethanol can be purified by .....

.

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22. The method used to purify petroleum, coal-tar and crude oil is

View Text Solution

23. The method used in the manufacture of aniline and turpentine is ..... .

View Text Solution

24. The mixture of exhanol and water are separated by ..... .

View Text Solution

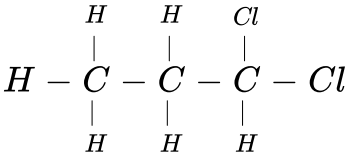
25. The different coloured constituents of chlorophyll are separated by

View Text Solution

26. The large number of organic compounds is due to ..... of carbon.

View Text Solution

27. The IUPAC name of the compound shown below is:



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28. $CH_2 = CH - \underset{\underset{CH_2CH_3}{|}}{CH} - \underset{\underset{Cl}{|}}{C} = CH_2$ The IUPAC name of this compound is ..... .

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29. Alcohols are isomeric with

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30. The correct IUPAC name for the following structure is ..... .

$$CH_3 - CH_2 - \underset{\underset{OH}{|}}{CH} - CH_2 - CH = CH_2$$

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31. The Prussian blue colour confirms the presence of nitrogen in an organic compound is due the formation of ..... .

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32. The principle involved in paper chromatography is ..... .

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33. The term anthesis is used for

Watch Video Solution

34. In chromatography, if the stationary phase is solid, the basis is .....

Watch Video Solution

35. In chromatography, if the stationary phase is solid, the basis is .....

Watch Video Solution

36. The isomer of ethanol is ..... .

Watch Video Solution

37. The general formula of alkyne is ..... .

Watch Video Solution

38. The IUPAC name of $(CH_3)_2CH - CH_2 - CH(CH_3) - CH(CH_3)_2$ is ..... .

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Additional Questions Solved Iv Choose The Odd One Out

1. Choose the odd one out

A. THF

B. Pyridine

C. Phenol

D. Thiophen

Answer: C

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2. Choose the odd one out

A. $CH_3 - CH_2 - CH_3$

B. $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_3$

C. $CH_3 - CH_2 - CH_2 - OH$

D. 

Answer: D

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3. Choose the odd one out

A. Azulene

B. Propane

C. Butane

D. Ethene

Answer: A

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4. Choose the odd one out

A. Dyes

B. Polymers

C. Cosmetics

D. Common salt

Answer: D

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5. Choose the odd one out

A. Benzene

B. Water

C. Ether

D. Chloroform

Answer: B

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Additional Questions Solved V Choose The Correct Pair

1. Choose the correct pair

A. Benzene: Aliphatic compound

B. Propane : Aromatic compound

C. Pyridine : Heterocyclic compound

D. Cyclohexane : Polycyclic compound

Answer: C

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2. Choose the correct pair

A. -OH : Ketone

B. -CHO : Carboxylic acid

C.  : Ketone

D. $-NO_2$: Amine

Answer: C

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3. Choose the correct pair

A. Organic compounds : inflammable

B. Organic compounds : ionic compound

C. Organic compounds : high boiling point and high melting point

D. Organic compounds : soluble in water

Answer: A

Watch Video Solution

4. Choose the correct pair

A. $C_nH_{2n+2} : C_2H_4$

B. $C_nH_{2n} : C_3H_6$

C. $C_nH_{2n-2} : C_2H_6$

D. $C_nH_{2n+2} : C_3H_4$

Answer: B

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5. Choose the correct pair

A.  : 1-propanol

B.  : cis 1,3-butadiene

C.  : Isobutyl chloride

D.  : 1,2-dimethyl cyclo pentane

Answer: A

View Text Solution

6. Choose the correct pair

A. n-pentane and iso pentane : position isomerism

B. neopentane and n-pentane : chain isomerism

C. propanal and propanone : position isomerism

D. propanoic acid and methyl acetate : chain isomerism

Answer: B

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Additional Questions Solved Vi Choose The Incorrect Pair

1. Choose the incorrect pair

A. Dumas method : Estimation of nitrogen

B. Kjeldahls method : Estimation of nitrogen

C. Carius method : Estimation of halogens

D. Dumas method : Estimation of sulphur

Answer: D

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2. Choose the incorrect pair

A. -CHO : Aldehyde

B. -COOH : Carboxylic acid

C. -NH_2 : Nitro group

D. -O : Ether

Answer: C

Watch Video Solution

3. Choose the incorrect pair

A. Benzene and nitro benzene : Distillation

B. Coal tar and crude oil : Fractional distillation

C. Aniline and turpentine : Steam distillation

D. Naphthalene and benzoic acid : Crystallization

Answer: D

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4. Choose the incorrect pair

A. $BaSO_4$: White colour precipitate

B. Ag_2S : Black colour precipitate

C. $Fe(CNS)_3$: Prussian blue colour

D. PbS : Black colour precipitate

Answer: C

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5. Choose the incorrect pair

A. propanal and propropane : Functional isomerism

B. Nitrite form and nitro form : Tautomerism

C. Pent-1-ene and pent-2-ene : Chain isomerism

D. Propanoic acid and methyl acetate : Functional isomerism

Answer: C

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Additional Questions Solved Vii Assertion Reason

1. Assertion (A): Carbon cannot form ionic bond.

Reason (R): It is not possible for the carbon to form either C^{4+} or C^{4-} ions, as it requires large amount of energy.

A. Both A and R are correct and R is the correct explanation of assertion.

B. Both A and R are correct but R is not the correct explanation of assertion.

C. A is correct.but R is wrong

D. A is wrong but R is correct.

Answer: A

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2. Assertion (A): Simple distillation can help in separating a mixture of propan-1-ol (boiling point $97^\circ C$) and propanone (boiling point $56^\circ C$).

Reason (R): Liquids with a difference of more than $20^\circ C$ in their boiling points can be separated by simple distillation.

A. Both assertion and reason are correct and reason is the correct explanation of assertion.

B. Both assertion and reason are correct but reason is not the correct explanation of assertion.

C. Assertion is correct.but reason is wrong

D. Assertion is wrong but reason is correct.

Answer: A

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3. Assertion (A): Pent-1-ene and pent-2-ene are position isomers.

Reason (R): Position isomers differ in the position of functional group or substituent.

A. Both assertion and reason are correct and reason is the correct explanation of assertion.

B. Both assertion and reason are correct but reason is not the correct explanation of assertion.

C. Assertion is correct.but reason is wrong

D. Assertion is wrong but reason is correct.

Answer: A

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Additional Questions Solved Viii Choose The Correct Statement

1. Choose the correct statement.

A. All organic compounds are ionic compounds.

B. All organic compounds have high boiling point and high melting point.

C. Many of the organic compounds are inflammable.

D. Organic compounds are mostly soluble in water.

Answer: C

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2. Choose the correct statement.

A. Propane is heterocyclic compound.

B. Azulene is a non benzenoid and aromatic homocyclic compound.

C. Pyridine is a homocyclic compound.

D. Cyclopropane is an aromatic compound.

Answer: B

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3. Choose the correct statement

A. $CH \equiv CH - CH_2 - C \equiv CH$ is a saturated open chain compound.

B. $CH_3 - CH_2 - CH_2 - CH_2 - CH_3$ is an aromatic benzenoid compound.

C.  is an aromatic benzenoid compound.

D.  is an aromatic benzenoid compound.

Answer: C

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4. Choose the correct statement.

A. Organic compounds are covalent and generally insoluble in water.

B. Organic compounds are ionic but generally soluble in water.

C. Organic compounds non-inflammable

D. Organic compounds do not show catenation.

Answer: A

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5. Choose the correct statement.

A. $Fe_4\left[Fe(CN)_6\right]_3$ is prussian blue precipitate.

B. Ag_2S is a white precipitate.

C. PbS is a blood red colour precipitate.

D. $BaSO_4$ is a black colour precipitate.

Answer: A

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Additional Questions Solved 2 Mark Questions Write Brief Answer To The Following Questions

1. What is catenation? Describe briefly the catenation property of carbon.

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2. Almost all compounds of carbon form covalent bonds. Give reason.

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3. What is meant by Convection ?

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4. Classify the following compounds based on the structure.

(i) $CH_2 = CH - CH = CH_2$ (ii)

$CH_3 - CH_2 - CH_2 - CH_2 - CH_2 - CH_3$

(iii) 

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5. Give two examples for each of the following type of organic compounds.

(i) non-benzonoid aromatic, (ii) aromatic heterocyclic, (iii) alicyclic and (iv) aliphatic open chain.

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6. Give two examples for each of the following type of organic compounds.

(i) Aromatic homocyclic compound (ii) Aromatic heterocyclic compound

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7. Write the functional group of the following compounds

(i) Aldehyde (ii) Ester (iii) Ether (iv) alcohol

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8. Write the functional group of (i) thiocyanate (in) isothiocyanate (iii) thiols (iv) thioether

Watch Video Solution

9. Write the functional group of (i) thiocyanate (in) isothiocyanate (iii) thiols (iv) thioether

Watch Video Solution

10. Write the IUPAC names of the following compounds.

(i) $CH_3 - CH_2 - \underset{\displaystyle CH_3}{\overset{|}{CH}} - CH_2 - CH_3$ (ii)

$$CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}} - CH_2 - CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle CH_2}{\overset{|}{\underset{|}{CH}}}} - CH_3$$

(iii) $CH_3 - \underset{\displaystyle CH_3}{\overset{|}{CH}} - CH_2 - CH_3$

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11. Write the IUPAC names of the following compounds.

(i) $CH_3 - \underset{\displaystyle CH_3}{\overset{|}{CH}} - \quad \underset{\displaystyle CH_2 - CH_3}{\overset{|}{CH}} \quad - CH_2 - CH_3$ (ii)

$$CH_3 - \underset{\displaystyle CHO}{\overset{|}{CH}} - CH_2 - CH_3$$

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12. Write the IUPAC names of the following compounds.

(i) $CH_3 - CH_2 - \underset{\displaystyle CH_3}{\overset{|}{CH}} - CH_2 - CH_3$ (ii)

$$CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}} - CH_2 - CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle CH_2}{\overset{|}{\underset{|}{CH}}}} - CH_3$$

(iii) $CH_3 - \underset{\displaystyle CH_3}{\overset{|}{CH}} - CH_2 - CH_3$

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13. Write the IUPAC names of the following compounds.

(i) $CH_3 - \underset{\displaystyle CH_3}{\overset{|}{CH}} - \underset{\displaystyle CH_2 - CH_3}{\overset{|}{CH}} - CH_2 - CH_3$ (ii)

$$CH_3 - CH_2 - \underset{\displaystyle COOH}{\overset{|}{CH}} - CH = CH_2$$

(iii) $HOOC - \underset{\displaystyle CH_3}{\overset{\displaystyle CHO}{\overset{|}{\underset{|}{C}}}} - CH_2 - CH_2 - CH_2 - CH_3$

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14. Predict the IUPAC names of the following compounds?

(i) 

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15. Write the IUPAC names of the following compounds?

(i) 

View Text Solution

16. Write the IUPAC names of the following compounds?

(i) 

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17. Write the structural formula for the following compounds.

(i) cyclohexa-1, 3-diene (ii) methyl cyclopentane

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18. Draw the structures of (i) o-xylene (ii) m-xylene (iii) p-xylene

Watch Video Solution

19. Draw the structure of (i) Mesitylene (ii) 1, 2, 3-trimethyl benzene

Watch Video Solution

20. Write the structure of (i) p-dinitrobenzene (ii) o-dichlorobenzene

Watch Video Solution

21. Draw the structure of (i) 2-cyclopentyl propanal (ii) 2-cyclo-but-enyl propanal

Watch Video Solution

22. What are the IUPAC names of the following compounds.

(i)  (ii) $CH_3 - CH_2 - CH_2 - \overset{CH_3}{\underset{|}{N}} - CH_2 - CH_3$

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23. Draw the structure of 4-hydroxy-3(2-hydroxy ethyl) hexanoic acid.

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24. Explain about dash line structure with a suitable example.

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25. What is meant by condensed structure? Explain with an example.

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26. What are bond line structures? Give one example.

Watch Video Solution

27. Define isomerism. Give example.

Watch Video Solution

28. Write the possible isomers for the formula C_5H_{10} with their name and type of isomerism present in it.

Watch Video Solution

29. Write the possible isomers for the formula $C_5H_{10}O$ with their name indicating position isomerism.

Watch Video Solution

30. Draw the functional isomers for the formula $C_3H_6O_2$ with their names.

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31. What is Metamerism ?

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32. What is wormery?

Watch Video Solution

33. What is meant by EIA?

Watch Video Solution

34. What is meant by isolated system? Give example.

Watch Video Solution

35. What is fertilization?

Watch Video Solution

36. Describe the structures of olfactory receptors.

Watch Video Solution

37. Explain ring chain isomerism with the formula C_4H_8.

Watch Video Solution

38. Define fuse.

Watch Video Solution

39. Describe optical isomerism with suitable example.

Watch Video Solution

40. Trans isomer is more stable than cis isomer. Justify this statement.

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41. Draw the cis, trans isomeric structures of 1,3-butadiene.

Watch Video Solution

42. The condition for skidding is

Watch Video Solution

43. How will you prepare Lassaigne's extract?

Watch Video Solution

44. What is the need for purification of organic compounds?

Watch Video Solution

45. Define sublimation. Give two examples.

Watch Video Solution

46. Explain the process of oogenesis.

Watch Video Solution

47. Draw the first six members of the carboxylic acid homologous series.

Watch Video Solution

48. Give the condensed formula and bond line formula of 2,2,4-trimethylpentane.

Watch Video Solution

49. Differentiate between the principle of estimation of nitrogen in an organic compound by

(i) Dumas method (ii) Kjeldahl's method.

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50. Explain the principle of paper chromatography.

View Text Solution

51. Explain the reason for the fusion of an organic compound with metallic sodium for testing nitrogen, sulphur and halogens.

View Text Solution

52. Name a suitable technique of separation of the components from a mixture of calcium, sulphate and camphor.

Watch Video Solution

53. Explain, why an organic liquid vapourises at a temperature below its boiling point on steam distillation?

View Text Solution

54. Will CCI_4 give white precipitate of AgCl on heating it with silver nitrate? Give reason for your answer.

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55. Why is a solution of potassium hydroxide used to absorb carbon dioxide evolved during the estimation of carbon present in an organic compound?

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56. Why is it necessary to use acetic acid and not sulphuric acid for acidification of sodium extract for testing sulphur by lead acetate test?

Watch Video Solution

57. Why is an organic compound fused with sodium for testing nitrogen, halogens and sulphur?

Watch Video Solution

58. Under what conditions can the process of team distillation is used?

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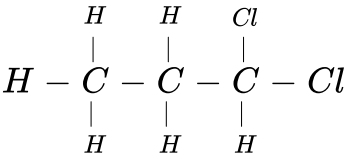
59. The IUPAC name of the compound shown below is:



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60. Write bond-line formulas for: Isopropyl alcohol. 2. 3-dimethylbutanal, Heptan-4-one.

Watch Video Solution

Additional Questions Solved 3 Mark Questions

1. Write the functional group of the following compounds:

(i) carboxylic acid (ii) Acid anhydride (iii) Acylchloride

(iv) Amide (v) Imines (vi) Nitroso compound

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2. What are the general molecular formula and functional group of the following compounds?

(i) Hydrazines (ii) Hydrazo compound (iii) Imide (iv) Phenols (v) Amine (vi) Nitroalkane

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3. Write the IUPAC names of the following compounds.

(i) $CH_3 - \underset{\underset{CHO}{|}}{CH} - CH_2 - CH_2 - CH_3$ (ii)

$CH_3 - CH_2 - CH_2 - \underset{\underset{COOH}{|}}{CH_2} = CH - CH_2 - CH_3$

(iii) $CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - CH_2CN$

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4. Write the IUPAC names of the following compounds.

(i) $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_2 - CH = CH - CH_3$

(ii) $CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - \overset{\overset{C_2H_5}{|}}{CH} - CH_2 - CH_3$

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5. Draw the structure of (i) 1-ethyl-2-methyl cyclopentane (ii) 1-ethyl-2, 3-dimethyl cyclohexane (iii) 5-ethyl-2-methylcyclohex-1-ene

Watch Video Solution

6. Draw the structures of:

(i) 2-cyclobutyl propane (ii) 2-cyclopropyl butane (iii) chlorocyclo but-2-ene

Watch Video Solution

7. Give the IUPAC names of the following compounds:

(i) 

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8. Write the IUPAC names of the following compounds:

(i) 

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9. Draw the structure (i) 1-(cyclo butyl)-2 (cylopropyl) ethane

(ii) 2-carbomyl cyclobutane-1-carboxylic acid

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10. Draw the structures of: (i) Bromobenzene (ii) 1,2-dichlorobenzene

(iii) 1-chloro-3-methylbenzene

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11. Draw the structures of (i) Benzyl chloride (i) Benzal dichloride (iii) Benzotrichloride

Watch Video Solution

12. Write the IUPAC names of the following compounds.

(i) $CH_3 - CH_2 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_2 - CH_3$ (ii)

$$CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}} - CH_2 - CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle CH_2}{\overset{|}{\underset{|}{CH}}}} - CH_3$$

(iii) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_2 - CH_3$

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13. Write the IUPAC names of the following compounds.

(i) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - \underset{\displaystyle CH_2 - CH_3}{\underset{|}{CH}} - CH_2 - CH_3$ (ii)

$$CH_3 - CH_2 - \underset{\underset{COOH}{|}}{CH} - CH = CH_2$$

(iii) $$HOOC - \underset{\underset{CH_3}{|}}{\overset{\overset{CHO}{|}}{C}} - CH_2 - CH_2 - CH_2 - CH_3$$

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14. Draw the structures of (i) 3-methylpentanal (ii) 5-hydroxy 2,2-dimethyl heptanoic acid (iii) 2-ethyl-4-propylpentane-dioic acid

Watch Video Solution

15. Give the IUPAC name of

(i) $$CH_3 - CH_2 - CH_2 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - CH_3$$ (ii)

$$CH_3 - \underset{\underset{CHO}{|}}{CH} - CH_2 - CHO$$

(iii) $$CH_3 - CH_2 - \underset{\underset{COOH}{|}}{CH} - CH - CH_3$$

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16. Give the IUPAC name of (i)

$$CH_3 - CH_2 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_2 - CH_2 - CN$$

(ii) $$CH_3 - \underset{\displaystyle CONH_3}{\underset{|}{CH}} - CH - CH_3$$ (iii)

$$CH_3 - \underset{\displaystyle OH}{\underset{|}{CH}} - CH_2 - CH - CH - CH_3$$

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17. Draw the structures of (i) 3-ethyl-5-methylheptane, (ii) 3-ethyl-2-methylhexane (iii) 2,4-dimethylpent-2-ene

Watch Video Solution

18. Draw the structures of:

(i) 3-methylhepta 1,3,5-triene, (ii) pent-1-yne, (iii) 2-methylpropan-2-ol

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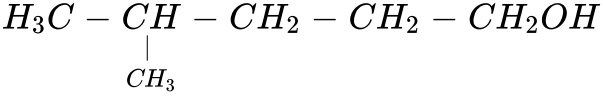
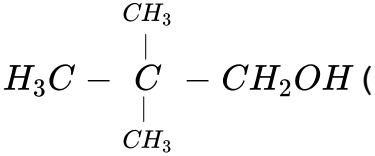
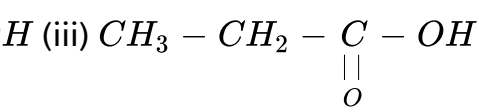
19. Give the IUPAC name of the following compounds.

(i)  (ii)

 (iii) 

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20. Draw the structural formula of:

(i) 4-methylpent-3-en-2-one (ii) pent-1-yne-3-one

Watch Video Solution

21. Write the IUPAC names of the following compounds.

(i)  (ii)

$CH_3 - \underset{\underset{CH_3}{|}}{CH} - NH - CH_3$

(iii) $CH_3 - CH_2 - CH_2 - \underset{\underset{CH_3}{|}}{N} - CH_3$

View Text Solution

22. Draw the structural formula of the following compounds.

(i) N-ethyl-N-methylpropan-1-amine (ii) N,N-dimethyl benzenamine

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23. Draw the complete structural formula, condensed structure and bond line structure of

(i) n-propanol (ii) 1, 3-butadiene.

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24. Draw the dash line structure, condensed structure and bond line structure of 1,3-dimethyl cyclopentane.

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25. What is wedge formula? Explain with suitable example.

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26. Draw the fisher projection formula for tartaric acid.

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27. Explain the advantage of sawhorse projection formula over the fisher projection formula with an example.

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28. Explain about the Newmann projection formula with an example.

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29. Write the possible isomers for the formula C_5H_{12} with their names and structures.

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30. What are the possible isomers for the formula C_4H_9Cl ? Give their structures and IUPAC names.

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31. Write the metamers for the formula $C_5H_{10}O$ with their IUPAC names.

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32. Explain about the geometrical isomerism possible in oximes.

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33. What are enantiomers?

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34. How would you detect sulphur?

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35. Explain about the oxidation test for sulphur.

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36. How would you detect the halogens in an organic compound?

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37. Why nitric acid is added in the Lassaigne's test for halogens?

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38. Explain about the test for phosphorous in an organic compound.

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39. Explain about principle and reactions involved in carius method of estimation of sulphur.

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40. Explain about the procedure and calculation behind the carius method of estimation of sulphur.

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41. How are naphthalene and camphor purified?

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42. Explain how nitrobenzene and benzene are separated and purified. (or) How will you separate the mixture of diethyl ether and

ethanol?

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43. Explain about differential extraction.

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44. Explain about the principle involved in chromatography. Give its types.

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45. Describe about adsorption chromatography.

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46. What are hybridisation states of each carbon atom in the following compounds?

$CH_2 = C = O, CH_3CH = CH_2, (CH_3)_2CO, CH_2 = CHCN, C_6H_6$

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47. Give the IUPAC names of the following compounds.

(a)  (f) Cl_2CHCH_2OH

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48. Write the formulas for the first five members of each homologous series beginning with the following compound.

CH_3COCH_3

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49. Write the formulas for the first five members of each homologous series beginning with the following compound: $H - CH = CH_2$

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50. Identify the functional groups in the following compounds.

(a) 

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51. What is the difference between distillation, distillation under reduced pressure and steam distillation?

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52. (a) What is Lassaigne's extract? Will NaCN give a positive Lassaigne's test for nitrogen?

(b) Which colour will appear in the Lassaigne's test if the compound contains both nitrogen and sulphur.

(c) Why is Lassaigne's extract prepared in distilled water? Can we detect oxygen in a compound by Lassaigne's test?

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53. 0.3780 g of an organic compound gave 0.5740 g of silver chloride in Carius estimation. Calculate the percentage of chlorine in the compound.

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54. In an estimation of sulphur by Carius method, 0.468 of an organic sulphur compound gave 0.668 g of barium sulphate. Find the percentage of sulphur in the compound.

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Additional Questions Solved 5 Marks Questions

1. Explain about the steps involved in naming an organic compound as IUPAC nomenclature.

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2. How will you detect the presence of carbon and hydrogen in an organic compound?

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3. Explain about lassaigne's test for detection of nitrogen in an organic compound.

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4. Explain about the estimation of carbon and hydrogen.

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5. Explain about the estimation of halogens by carius method.

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6. How will you estimate phosphorous in an organic compound?

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7. Explain Dumas method of estimation of nitrogen.

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8. Explain Kjeldahl's method.

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9. Explain the various steps involved in crystallization method.

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10. Explain about steam distillation (or) How is essential oils are recovered from plants and flowers.

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11. Explain about azeotropic distillation.

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12. Explain about thin layer chromatography.

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13. An organic compound contains 69% carbon and 4.8% hydrogen, the remainder being oxygen. Calculate the masses of carbon dioxide and water produced when 0.20 g of this compound is subjected to complete combustion.

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14. 0.50 g of an organic compound was Kjeldahlished. The ammonia evolved was passed in $50cm^3$ of 1N H_2SO_4. The residual acid required $60cm^3$ of $N/2$ NaOH solution. Calculate the percentage of nitrogen in the compound.

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15. In a Dumas nitrogen estimation method, 0.30 g of an organic compound gave $50cm^3$ of N_2 collected at 300 K and 715 mm Hg pressure. Calculate the percentage composition of nitrogen in the compound. (Vapour pressure of water at 300 K is 15 mm Hg)

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