QB365

Important Questions - Organic Chemistry : Some Basic Principles and Techniques

11th Standard CBSE

Chemistry Reg.No. : | | | | | | |

Time : 01:00:00 Hrs

Total Marks : 50

Section-A

1) What are primary and secondary suffixes as applied to IUPAC nomenclature? **1**

2) What is the general molecular formula of saturated monohydric alcohols? **1**

3) Explain, why an organic liquid vaporises at a temperature below its boiling point in its steam distillation? **1**

4) The R_f value of A and B in a mixture determined by TLC in a solvent mixture are 0.65 and 0.42 respectively. If the mixture is separated by column chromatography using the same solvent mixture on a mobile phase, which of the two components A or B will elute first? Explain. **1**

5) Will CCI_4 give precipitate of AgCI on heating it with silver nitrate?Give reason for your answer. **1**

CCl_4 is a covalent compound and does not give CI^- ions.

6) Using curved arrow notation, show the formation of reactive intermediates when the following covalent bonds undergo heterolytic cleavage **1**

CH_3 - Cu.

7) Give the common name of methanol. **1**

8) Give the common name of ethanol. **1**

9) Give the common name of ethoxyethane. **1**

10) Which of the following represents the correct IUPAC name for the compounds concerned? **1**

2,4,7-trimethyloctane or 2,5,7-trimethyloctane

Section-B

11) How manyσ and π bonds are present in each of the following molecules? **2**

(i) $CH_3CH_2C \equiv N$

12) Which of the following compounds will not exist as resonance hybrid. Give reason for your answer. **2**

CH_3OH

13) Which of the following compounds will not exist as resonance hybrid. Give reason for your answer. **2**

$CH_3CH = CHCH_2NH_2$

14) Classify the following reactions in one of the reaction type studied in this unit. **2**

$CH_3CH_2Br + HS^- \longrightarrow CH_3CH_2SH + Br^-$

A nucleophile (Br^-)is substituted by other nucleophiles (HS^-)

HCI is added to the double bond (C=C)

H and Br are eliminated from successive carbon atoms.

Nucleophile (OH^-) is substituted by Br^-

15) Write down the formula of the first four members of each homologous series beginning with the following compounds. **2**

$CH_2 = CH_2$

16) Write down the formula of the first four members of each homologous series beginning with the following compounds. **2**

$HCOOH$

17) Write down the formula of the first four members of each homologous series beginning with the following compounds. **2**

CH_3COCH_3

18) Write down the formula of the first four members of each homologous series beginning with the following compounds. **2**

CH_3OH

19) Draw formulae for the first five members of each homologous series beginning with the following compounds. **2**

(i) H-COOH

20) Draw formulae for the first five members of each homologous series beginning with the following compounds. **2**

(i) CH_3COCH_3

Section-C

21) Arrange the following compounds in increasing order of acidity. **4**

I. $CH_3CH(Br)CH_2COOH$

II. $CH_3CH_2CH(Br)COOH$

III. $CH_3CH_2C(Br)_2COOH$

IV. $CH_3BrCH_2CH_2COOH$

22) Sohan was very upset from last few days when he came to know that his father is alcoholic (takes alcohol).He knows about the side effects of the alcohol so want to keep away his father from it.He decided to talk about this with his father.When he asked his father about it, he told him, that he is not alcoholic, only occasionally he takes it but of Sohan does not even want him to ever touch it. **4**

What are the side effects of alcoholic beverages?

23) Sohan was very upset from last few days when he came to know that his father is alcoholic (takes alcohol).He knows about the side effects of the alcohol so want to keep away his father from it.He decided to talk about this with his father.When he asked his father about it, he told him, that he is not alcoholic, only occasionally he takes it but of Sohan does not even want him to ever touch it. **4**

What values are possessed by Sohan and his father?

24) Mr.Sing altered the amount of cheque and was caught by police. Chromatography is an important technique extensively used to separate a mixture into their components to purify compounds and also to test the purity of compounds. If any cheque is written in a particular ink and somebody else alters it with another ink, it can be detected with the help of chromatography. **4**

What values are not possessed by Mr.Sing involved in forgery?

25) During estimation of nitrogen present in an compound by Kjeldahl's method the ammonia evolved 0.5 g of the compound in Kjeldahal's estimation of nitrogen,neutralized 10 mL of 1 M H_2SO_4 .Find out precentage of nitrogen in the compound. **4**

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Section-A

1) **1**

The primary suffix indicates whether the carbon chain is saturated or unsaturated while the secondary suffix indicates the functional group present in the molecule.

2) **1**

Monohydric alchols are the compounds derived from alkane by replacing one hydrogen by - oh group. Therefore, the general molecular formula is $C_n H_{2n+1} OH$ or $C_n H_{2n+1} O$. e.g.

$$CH_4 \xrightarrow[+(-OH)]{-H} CH_3-OH \quad \text{Methane} \qquad \text{Methanol}$$

3) **1**

In steam distillation, the mixture consisting of the organic liquid and water boils when the sum of the vapour pressures of the organic liquid (p_1) and that of water (P_2) becomes equal to the atmospheric pressure (p_1), i.e. $p=p_1+p_2$. Since, p_1 is lower than p, the organic liquid vaporises at lower temperature than its boiling point

4) **1**

R_f value of A is 0.65, therefore, it is less strongly adsorbed as compared to compound B which has R_f value of 0.42. Therefore, A will be eluted first.

5) **1**

CCI_4 will not give a white ppt of AgCI with $AgNO_3$ solution because CCI_4 is a covalent compound.It does not ionise to give CI^- ions required for the formation of AgCI precipate.

6) $CH_3-Cu \qquad C^-H_3+Cu^+ \qquad \text{Carbonion}$ **1**

7) methyl alcohol **1**

8) ethyl alcohol **1**

9) diethyl ether **1**

10) 2,4,7-trimethyloctane (because 2, 4, 7-locant set is lower than 2, 5, 7). **1**

Section-B

11) $\sigma_{C-C}=2, \quad \sigma_{C-H}=5, \quad \sigma_{C-N}=1, \quad \pi_{C-N}=2$ **2**

$\sigma_{C-C}=2, \quad \sigma_{C-H}=5, \quad \sigma_{C-N}=1, \quad \pi_{C-N}=2$

12) CH_3OH as it lacks π -electrons hence it will not exist as resonance hybrid. **2**

13) **2**

$CH_3CH = CHCH_2NH_2$ As the lone pair of electrons on the N-atom is not conjugated with the -electrons of the double bond, thus, resonance is not possible and hence no resonance hybrid will exist.

14) Nucleophilic substitution reaction **2**

15) $CH_2 = CH_2, CH_3CH = CH_2, CH_3CH_2CH = CH_2, CH_3CH_2CH_2CH = CH_2$ **2**

16) $HCOOH, CH_3COOH, CH_3CH_2COOH, CH_3CH_2CH_2COOH$ **2**

17) $CH_3COCH_3, CH_3CH_2COCH_3, CH_3CH_2CH_2COCH_3, CH_3CH_2CH_2CH_2COCH_3$ **2**

18) $CH_3OH, CH_3CH_2OH, CH_3CH_2CH_2OH, CH_3CH_2CH_2CH_2OH$ **2**

19) **2**

20) **2**

Section-C

21) **4**

As we know inductive effect decrease as we move away from the cause of polarity. Here, Br group is the cause of polarity, so as the distance between Br and COOH increases, inductive effect as well as acidity decreases. Thus, the order of acidity is

III > II > I > IV

more I group

Remember! As the distance between + I showing group and - COOH increases, acidity increases.

22) **4**

Alcohol acts as a depressant on the central nervous system. It has a complex mode of action and affects multiple systems in the brain. Its long-term consumption may cause irreversible damage to the liver.

23) **4**

Values possessed by Sohan are the loving and caring attitude towards his father. Values possessed by the father is love towards this child.

24) He is dishonest people. He does not understand the value of honesty and strong moral character. **4**

25) **4**

1 M of 10 ML H_2SO_4=1 M of 20 mL NH_3

∵ 1000 mL of 1 M ammonia contains nitrogen=14 g

∴ 20 mL of 1 M ammonia will contain nitregon= 14X12/1000 g

∴ Percentage of nitrogen =14X20X100/1000X0.5=56.0%

Kjeldahl's method is not applicable to compounds containing nitrogen in nitro and azo groups and nitrogen present in the ring, as nitregon of these compounds is not quantitavely converted into ammonium sulphate.