CHEMISTRY

BOOKS - SURA CHEMISTRY (TAMIL ENGLISH)

CARBONYL COMPOUND

Choose The Correct Answer

1. The formation of cyanohydrin from acetone is an example of

A. nucleophilic substitution

B. electrophilic substitution

C. electrophilic addition

D. nucleophilic addition

Answer: D

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2. Reaction of acetone with one of the following reagents involves nucleophilic addition followed by elimination of water. The reagent is

A. Grignard reagent

B. Sn/HCl

C. hydrazine in presence of slightly acidic solution

D. hydrocyanic acid

Answer: C

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3. In the following reaction,

$$HC \equiv CH \xrightarrow[HgSO_4]{H_2SO_4}$$

X Product 'X' will not give

A. Tollen's test

B. Victor meyer test

C. Iodoform test

D. Fehling solution test

Answer: B

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4. $CH_2 = CH_2 \xrightarrow[\text{ii)}Zn/H_2O]{\text{i)}O_3} X \xrightarrow{NH_3} Y$ 'Y' is

A. Formaldelyde

B. diacetoneammonia

C. hexamethylenetetraamine

D. oxime

Answer: C

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5. Perdict the product (C) of the following sequence of reactions :

$$CH_3COOH \xrightarrow{PCl_5} [A] \xrightarrow[\text{Anhyd.}AlCl_3]{C_6H_6} [B] \xrightarrow[H_2O^+]{CH_3MgBr} [C]$$

A. $(CH_3)_2C(OH)C_6H_5$

B. $CH_3CH(OH)C_6H_5$

C. $CH_3CH(OH)CH_2-CH_3$

D. 

Answer: A

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6. Assertion : $(CH_3)_3CCOOH$ does not give HVZ reaction.

Reason : $(CH_3)_3CCOOH$ does not have any α-hydrogen atom.

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

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

C. assertion is true but reason is false

D. both assertion and reason are false.

Answer: A

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7. Which of the following presents the correct order of the acidity in the given compounds?

A.

$$FCH_2COOH > CH_3COOH > BrCH_2COOH > ClCH_2COOH$$

B.

$$FCH_2COOH > ClCH_2COOH > BrCH_2COOH > CH_3COOH$$

C.

$$CH_3COOH > ClCH_2COOH > FCH_2COOH > Br - CH_2COOH$$

D.

$$ClCH_2COOH > CH_3COOH > BrCH_2COOH > ICH_2COOH$$

Answer: A

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8. Benzoic acid $\xrightarrow[\text{ii)}\Delta]{\text{i)}NH_3} A \xrightarrow{NaOBr} B \xrightarrow{NaNO_2/HCl} C'C'$ is

A. anilinium chloride

B. O - nitro aniline

C. benzene diazonium chloride

D. m - nitro benzoic acid

Answer: C

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9. $\text{Ethanoic acid} \xrightarrow{P/Br_2} 2-\text{bromoethanoic acid}$. This reaction is called

A. Frinkelstein reaction

B. Haloform reaction

C. Hell - Volhard - Zelinsky reaction

D. none of these

Answer: C

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10. $CH_3Br \xrightarrow{KCN} (A) \xrightarrow{H_3O^+} (B) \xrightarrow{PCl_5} (C)$ product (c) is

A. acetychloride

B. chloro acetic acid

C. α - chlorocyano ethanoic acid

D. none of these

Answer: A

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11. Which one of the following reduces tollens reagent

A. formic acid

B. acetic acid

C. benzophenone

D. none of these

Answer: A

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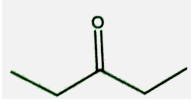
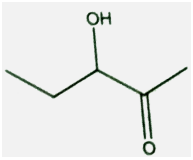
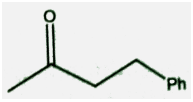
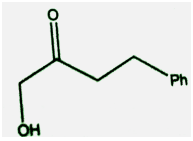
12. In which case chiral carbon is not generated by reaction with HCN

A. 

B. 

C. 

D. 

Answer: A

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13. Assertion: $p-N, N-$ dimethylaminobenzaldehy under-goes benzoin condensation

Reason : The aldehydic $(-CHO)$ group is meta directing.

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

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

C. assertion is true but reason is false

D. both assertion and reason are false.

Answer: B

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14. Which one of the following reaction is an example of disproporationation reaction

A. Aldol condensation

B. cannizaro reaction

C. Benzoin condensation

D. none of these

Answer: B

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15. Which one of the following undergoes reaction with 50% sodium hydroxide solution to give the corresponding alcohol and acid

A. phenylmethanal

B. ethanal

C. ethanol

D. methanol

Answer: A

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16. The reagent used to distinguish between acetaldehyde and benzaldehyde is

A. Tollens reagent

B. Fehling's solution

C. 2,4 - dinitrophenyl hydrazine

D. semicarbazide

Answer: B

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17. Phenyl methanal is reacted with concentrated NaOH to give two products X and Y.X reacts with metallic sodium to liberate hydrogen X and Y are

A. sodiumbenzoate and phenol

B. Sodium benzoate and phenyl methanol

C. phenyl methanol and sodium benzoate

D. none of these

Answer: C

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18. In which of the following reactions new carbon - carbon bond is not formed?

A. Aldol condensation

B. Friedel craft reaction

C. Kolbe's reaction

D. Wolf kishner reduction

Answer: D

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19. An alkene "A" on reaction with O_3 and Zn gives propanone and ethanol in equimolar Addition of HCl to alkene "A" gives "B" as the product. The structure of product "B" is:

A. $Cl - CH_2 - CH_2 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{CH}}$

B. $H_3C - CH_2 - \overset{\overset{CH_2Cl}{|}}{CH} - CH_3$

C. $H_3C - CH_2 - \overset{\overset{CH_3}{|}}{\underset{\underset{Cl}{|}}{C}} - CH_3$

D. $H_3C - CH - \overset{\overset{CH_3}{|}}{\underset{\underset{Cl}{|}}{CH}}$

Answer: C

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20. Carboxylic acids have higher boiling points than aldehydes, ketones and even alcohols of comparable molecular mass. It is due to their

A. more extensive association of carboxylic acid via van der Waals force of attraction

B. formation of carboxylate ion

C. formation of intramolecular H-bonding

D. formation of intermolecular H-bonding

Answer: D

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21. Of the following, which is the product formed when cyclohexanone undergoes aldol condensation followed by heating?

A. 

B. 

C. 

D. 

Answer: A

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Short Answer Questions

1. How is propanoic acid is prepared starting from

an alcohol

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2. How is propanoic acid is prepared starting from

an alkylhalide

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3. How is propanoic acid is prepared starting from

an alkene

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4. A Compound (A) with molecular formula C_2H_3N on acid hydrolysis gives (B) which reacts with thionylchloride to give compound (C).

Benzene reacts with compound (C) in presence of anhydrous $AlCl_3$ to give compound (D). Compound (D) on reduction gives (E). Identify (A), (B), (C), (D) and (E). Write the equations.

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5. Identify X and Y.

$$CH_3COCH_2COOC_2H_5 \xrightarrow{CH_3MgBr} X \xrightarrow{H_3O^+} Y$$

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6. Identify A, B and C

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7. A hydrocarbon A(molecular formula C_8H_{10}) on ozonolysis gives $B(C_4H_6O_2)$ only. Compound $C(C_3H_5Br)$ on treatment with magnesium

in dry ether gives (D) which on treatment with CO_2 followed by acidification gives(B). Identify A, B, C and D.

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8. Identify A, B, C and D

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9. An alkene (A) on ozonolysis gives propanone and aldehyde (B). When (B) is oxidised (C) is obtained. (C) is treated with Br_2 / P gives (D) which on hydrolysis gives (E). When propanone is treated with HCN followed by hydrolysis gives (E). Identify A, B, C, D and E.

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10. How will you convert benzaldehyde into the following compounds?

benzophenone

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11. How will you convert benzaldehyde into the following compounds?

benzoic acid

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12. How will you convert benzaldehyde into the following compounds?

α - hydroxy phenyl acetic acid.

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13. What is the action of HCN on

propanone

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14. What is the action of HCN on

2,4-dichlorobenzaldehyde

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15. A carbonyl compound A having molecular formula $C_5H_{10}O$ forms crystalline precipitate with sodium bisulpite and gives positive iodoform test. A does not reduce Fehling solution. Identify A.

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16. Write the structure of the major product of the aldol condensation of benzaldehyde with acetone.

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17. Propanal to butanone

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18. How are the following conversions effected

Hex-3-yne into hexan-3-one.

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19. How are the following conversions effected

phenylmethanal into benzoic acid

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20. How are the following conversions effected

phenylmethanal into benzoin

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21. Complete the following reaction.

$$CH_3 - CH_2 - CH_2 - \underset{\underset{O}{||}}{C} - CH_3 \xrightarrow[H^+]{HO - CH_2 - CH_2 - CH_2 - OH} ?$$

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22. Identify A, B and C

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23. Oxidation of ketones involves carbon-carbon bond cleavage. Name the products formed on oxidation of 2, 5-dimethylhexan-3-one.

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Evaluate Yourself

1. Write the IUPAC name for the following compound.

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2. Write the IUPAC name for the following compound.

$(CH_3)_2C = CHCOCH_3$

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3. Write the IUPAC name for the following compound.

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4. Write the IUPAC name for the following compound.

$(CH_3)_2C(OH)CH_2CHO$

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5. Write all possible structural isomers and position isomers for the ketone represented by the molecular formula $C_5H_{10}O$.

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6. What happens when the following alkenes are subjected to reductive ozonolysis?

Propene

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7. What happens when the following alkenes are subjected to reductive ozonolysis?

1 - Butene

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8. What happens when the following alkenes are subjected to reductive ozonolysis?

Isobutylene

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9. The compound formed as a result of oxidation of propyl benzene by $KMnO_4$ is

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10. How will you prepare benzoic acid using Grignard reagent.

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11. Why acid anhydride are preferred to acyl chloride for carrying out acylation reactions ?

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Additional Questions And Answers Choose The Correct Answer

1. Give the common and IUPAC name of the compound

$$HO - CH_2 - \underset{\underset{OH}{|}}{CH} - CHO$$

A. glyceraldehyde, hydroxy propanal

B. glyceraldehyde, 2, 3 - dihydroxy propanal

C. crotonaldehyde, hydroxy propanal

D. crotonaldehyde, 2, 3 - dihydroxy propanal

Answer: B

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2. Cannizaro reaction is not given by

A. 

B. 

C. CH_3CHO

D. HCHO

Answer: C

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3. Which among the following on oxidation with alk.$KMnO_4$ will give butanone?

A. Butan -1 -ol

B. Butan - 2 -ol

C. Both (a) and (b)

D. Neither (a) nor (b)

Answer: B

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4. Which among the carbonyl compounds cannot be prepared by Rosenmund reduction?

A. Ketones

B. Formaldehyde

C. Acetaldehyde

D. Both (a) and (b)

Answer: D

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5. Which among the following statement is incorrect regarding urotropine?

A. It is an urinary antiseptic

B. It is hexa methylene diamine

C. Used in the preparation of an explosive

D. All the above

Answer: B

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6. Which of the following acids do not exhibit optical iosmerism?

A. lactic acid

B. tartaric acid

C. maleic acid

D. both (a) and (b)

Answer: C

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7. A compound 'X' when mixed with ethanol and a drop of concentrated H_2SO_4 gave a compound with fruity odour. Identify 'X'.

A. HCHO

B. CH_3OH

C. CH_3COOH

D. CH_3NH_2

Answer: C

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8. Pick out the compound/s that gives effervescence with aqueous $NaHCO_3$

$I. C_6H_5OH \qquad II. C_6H_5NH_2$

$III. (CH_3CO)_2O \qquad IV. CH_3COOH$

A. I and II

B. I and IV

C. III and IV

D. III and I

Answer: C

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9. Schiff's reagent gives pink colour with

A. acetone

B. acetaldehyde

C. ethyl alcohol

D. methyl acetate

Answer: B

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10. Isopropyl alcohol vapours react with air over silver catalyst at 520 K give

A. tert.butyl alcohol

B. acetaldeyde

C. acetone

D. 2-propanol

Answer: C

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11. Methyl ketones are usually characterised by

A. the Fehling's solution

B. the iodoform test

C. the Schiff's test

D. the Tollen's reagent

Answer: B

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12. Which of the following compund is oxidised to give ethyl methyl ketone?

A. 2-propanol

B. 2-pentanone

C. 1-butanol

D. 2-butanol

Answer: D

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13. Formaldehyde polymerises to give

A. paraldehyde

B. paraformaldhyde

C. formalin

D. formic acid

Answer: B

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14. When acetaldehyde is treated with Fehling's soluion , it gives a precipitate of

A. Cu_2O

B. CuO

C. $CuO + Cu_2O$

D. Cu

Answer: B

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15. Tincture benzoin is obtained from

A. benzoyl chloride

B. benzoin

C. benzyl alcohol

D. benzoic acid

Answer: B

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16. The formation of cyanohydrin from a ketone is an example of

A. electrophilic addition

B. nucleophilic addition

C. nucleophilic substitution

D. electrophilic substitution

Answer: B

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17. Hydrogenation of benzoyl chloride in the presence of Pd on $BaSO_4$ gives

A. phenol

B. benzoic acid

C. benzyl alcohol

D. benzaldehyde

Answer: D

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18. From which of the following, tertiary butyl alcohol is obtained by the action of methyl magnesium iodide?

A. HCHO

B. CH_3CHO

C. CH_3COCH_3

D. CO_2

Answer: C

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19. In the reduction of acetaldehyde using $LiAlH_4$ the hydride ion acts as

A. electrophile

B. nucleophile

C. both (a) and (b)

D. a free radical

Answer: B

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20. Which of the following statement is wrong?

A. 2-pentanone and 3-pentanone are position isomers.

B. Aqueous solution of formaldehyde is known as formalin.

C. Aldehydes and ketones undergo nucleophilic substitution.

D. Aldehydes act as reducing agents.

Answer: C

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21. The IUPAC name of is $CH_3 - \underset{\underset{CH_3}{|}}{C} = CH - \underset{\underset{O}{||}}{C} - CH_3$

A. 4-methylpent - 3 -en-2 - one

B. 2-methylpent - 3 -en -2 - one

C. 3-methylpent - 2 -en -1 - one

D. none of these

Answer: A

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22. Which of the following does not give iodoform test?

A. aceto phenone

B. benzophenone

C. $CH_3 - \underset{\underset{CH_3}{|}}{CHOH}$

D. $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_2CH_2 - CH_3$

Answer: B

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23. Which compound on strong oxidation gives propionic acid?

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

B. $CH_3 - CO - CH_3$

C. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - OH$

D. $CH_3CH_2CH_2OH$

Answer: D

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24. Calcium acetate + calcium benzoate $\xrightarrow{\text{distillation}}$ gives

A. benzophenone

B. benzaldehyde

C. acetophenone

D. phenyl benzoate

Answer: C

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25. Bakelite is a product of the reaction between:

A. formaldehyde and NaOH

B. phenol and methanal

C. aniline and NaOH

D. phenol and chloroform

Answer: B

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26. Aldehydes may be distinguished from ketones by the use of

A. cone. H_2SO_4

B. Fehling's solution

C. pyrogallol

D. Lucas reagent

Answer: B

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27. On dry distillation this gives acetophenone.

A. calcium benzoate

B. calcium acetate and calcium benzoate

C. calcium acetate

D. calcium acetate and calcium formate

Answer: B

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28. Benzoin condensation is carried out in the presence of

A. alc. KCN

B. alc. KOH

C. acidified KCN

D. both (a) and (c)

Answer: A

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29. Which among the following does not give haloform test?

A. CH_3CHO

B. $CH_3COC_2H_5$

C. $CH_3CH_2COCH_2CH_3$

D. $CH_3CH_2COCH_3$

Answer: C

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30. In Rosenmund's reduction, $BaSO_4$ is used

A. to increase the activity of Pd catalyst

B. to increase the activity of Fe catalyst

C. to lower the activity of Pt catalyst

D. to lower the activity of Pd catalyst

Answer: D

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31. $LiAlH_4$ and $NaBH_4$ are

A. H^+ donor

B. H^- donor

C. H^- acceptor

D. None

Answer: B

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32. 4 - methyl pent - 3 -en - 2 - one is the IUPAC name of

A. mesitylene

B. mesityl oxide

C. phorone

D. chloretone

Answer: B

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33. Predict the product for the following reaction

$C_6H_5COCH_3 + Br_2 \rightarrow ?$

A. m-nitro acetophenone

B. phenaceyl bromide

C. benzophenone

D. phenyl glyoxalic acid

Answer: B

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34. Choretone is an addition product of

A. $CH_3CHO, HCHO$

B. $CH_3CHO, CHCl_3$

C. $CH_3 - \underset{\underset{O}{||}}{C} - CH_3, CCl_4$

D. $CH_3 - \underset{\underset{O}{||}}{C} - CH_3, CHCl_4$

Answer: D

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35. The IUPAC name of $CH_3 - CH(CH_3) - CHO$

A. isobutyraldehyde

B. 2-methyl propanal

C. 3-methyl propanal

D. 2-butenal

Answer: B

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36. Give the structure of 3-phenyl prop-2-en-1-al

A. $CH_2 = CH - CHO$

B. $CH_3CHOH - CH_2CHO$

C. $C_6H_5CH = CH - CHO$

D. $CH_3 - CH = CH - CHO$

Answer: C

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

A. acraldehyde

B. crotonaldehyde

C. cinnmaldehyde

D. isobutyraldehyde

Answer: B

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38. Aldehydes are functional isomers of

A. ethers

B. alcohols

C. ketones

D. esters

Answer: C

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39. Which one of the following gives oxime with hydroxyl amine?

A. Benzene

B. Phenol

C. Benzaldehyde

D. benzoic acid

Answer: C

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40. Acetaldehyde cyanohydrin on hydrolysis gives

A. acetic acid

B. lactic acid

C. cinnamic acid

D. mandelic acid

Answer: B

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41. Ketones when reduced in the presence of Pt forms

A. primary alcohols

B. secondary alcohols

C. tertiary alcohols

D. acids

Answer: B

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42. Pick out the compound that reduces Tollen's reagent and Fehling's solution.

A. CH_3CHO

B. CH_3COCH_3

C. CH_3COOH

D. both (a) and (b)

Answer: A

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43. The pink colour of Schiff's reagent is restored by

A. alcohol

B. acid

C. ketone

D. aldehyde

Answer: D

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44. When aqueous solution of formaldehyde is evaporated to dryness it forms a polymer called

A. paraldehyde

B. paraformaldehyde

C. bakelite

D. polyamide

Answer: B

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45. Formaldehyde reacts with ammonia to give

A. $(CH_2)_4N_6$

B. $(CH_2)_5N_5$

C. $(CH_2)_6N_4$

D. $(CH_2)_6N_3$

Answer: C

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46. In Friedel Craft's reaction of benzoylation of benzene, which of the following acts as a electrophile?

A. $CHCO^+$

B. $CHCO^-$

C. CH_3CO^+

D. CH_3CO^-

Answer: C

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47. Which of the following is least acidic

A. C_2H_5OH

B. CH_3COOH

C. C_6H_5OH

D. $ClCH_2COOH$

Answer: A

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48. Ester formation involves the reaction of

A. an aldehyde and a ketone.

B. an alcohol with RMgX.

C. two molecules of an acid with dehydrating agent

D. An acylhalide with an alcohol

Answer: D

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49. Heating a mixture of sodium acetate and soda lime gives

A. methane

B. ethane

C. acetic acid

D. benzene

Answer: A

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50. The acid that cannot be prepared by Grignard reagent

A. acetic acid

B. formic acid

C. butyric acid

D. benzoic acid

Answer: B

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51. The IUPAC name of

$$CH_3 - CH_2 - \overset{CH_3}{\underset{|}{C}}H - COOH$$ is

A. α-methyl buturic acid

B. 3-methyl butanoic acid

C. 2-methyl butanoic acid

D. Iso pentanoic acid

Answer: C

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52. Which order of arrangement is correct in terms of the strength of the acid

A.

$$CH_3 - CH_2COOH > CH_3COOH < HCOOH < ClCH_2COOH$$

B. $ClCH_2COOH < HCOOH < CH_3COOH < CH_3CH_2COOH$

C.

$$CH_3 - CH_2COOH < CH_3COOH < HCOOH < ClCH_2COOH$$

D. $HCOOH > CH_3CH_2COOH < CH_3COOH > ClCH_2COOH$

Answer: C

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53. When chlorine is passed through acetic acid in presence of red phosporous, it forms

A. acetyl chloride

B. trichloro acetaldehyde

C. trichloro acetic acid

D. methyl chloride

Answer: C

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54. Which of the following compounds will react with $NaHCO_3$ solution to give sodium salt and CO_2?

A. Acetic acid

B. n-Hexanol

C. Phenol

D. Both (a) and (c)

Answer: A

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55. When propanoic acid is treated with aqueous sodium-bicarbonate, CO_2 is liberated. The "C" of CO_2 comes from

A. methyl group

B. carboxylic acid group

C. methylene group

D. bicarbonate

Answer: D

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56. Carboxylic acids are more acidic than phenol and alcohol because of

A. intermolecular hydrogen bonding

B. formation of dimers

C. highly acidic hydrogen

D. greater resonance stabilisation of their conjugate base

Answer: D

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57. Which of the following compound is optically active?

A. CH_3CH_2COOH

B. $HOOC - CH_2 - COOH$

C. $CH_3CH(OH)COOH$

D. $Cl_2CHCOOH$

Answer: C

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58. Acids have higher boiling points due to

A. pleasant smell

B. waxy solid

C. hydrogen bonding

D. $-COOH$ group

Answer: C

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59. Which is unstable?

A. HCOOH

B. CH_3CH_2COCl

C. CH_3COCl

D. HCOCl

Answer: D

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60. Acetic acis when heated with HI/P gives

A. methane

B. ethane

C. propane

D. acetaldehyde

Answer: B

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61. On Kolbe's electrolysis, formic acid gives

A. H_2

B. methane

C. ethane

D. none

Answer: A

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62. Chloroacetic acid is stronger than acetic acid due to

A. $+I$ effect

B. $-I$ effect

C. $+M$ effect

D. $-M$ effect

Answer: B

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63. O-nitro benzoic acid is stronger than O-chloro benzoic acid and salicylic acid due to

A. $-M$ effect

B. $+M$ effect

C. $-I$ effect

D. $+I$ effect

Answer: C

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64. Toluene is oxidised by acidified $KMnO_4$ to

A. salicylic acid

B. benzyl alcohol

C. Benzaldehyde

D. benzoic acid

Answer: D

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65. It is used as food preservative

A. sodium benzoate

B. ammonium benzoate

C. benzoic acid

D. formic acid

Answer: A

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66. It is a powerful acetylating agent for compounds containing -OH group and - NH group.

A. CH_3CONH_2

B. CH_3COOH

C. CH_3COCl

D. CH_3COOCH_3

Answer: C

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67. Carboxylic acids are functional isomers of

A. ethers

B. alcohols

C. aldehydes

D. esters

Answer: D

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68. Primary alcohol on oxidation gives

A. aldehyde

B. ketones

C. both (a) and (b)

D. Neither (a) nor (b)

Answer: A

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69. Oxidation of secondary alcohol gives

A. aldehydes

B. ketones

C. ethers

D. primary alcohols

Answer: B

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70. Lower members of carboxylic acid family are

A. waxy solids.

B. pleasant smelling liquids.

C. foul smelling liquids.

D. inert gases.

Answer: B

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71. The high boiling points of carboxylic acids is due to

A. weak Vanderwaal's forces.

B. intermolecular hydrogen bonding.

C. intramolecular hydrogen bondling.

D. delocalisation of π electrons.

Answer: B

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72. Higher members of carboxylic acids are water insoluble due to

A. hydrophobic alkyl groups.

B. hydrophillic alkyl groups.

C. intramolecular hydrogen bonding

D. none of the above

Answer: A

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73. Acetic acid undergoes dehydration on heating with P_2O_5 to form

A. CH_3COOCH_3

B. CH_3OH

C. $(CH_3CO)_2O$

D. none of the above

Answer: C

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74. Identify which of the following compounds would give positive iodoform test.

A. $CH_3 - CH_2 - CH_2 - \overset{\overset{O}{||}}{C} - CH_3$

B. $CH_3 - CH_2 - \overset{\overset{O}{||}}{C} - OCH_2 - CH_3$

C. $CH_3 - CH_2 - \overset{\overset{O}{||}}{C} - CH_2 - CH_3$

D. $C_6H_5 - \overset{\overset{O}{||}}{C} - CH_3$

Answer: A

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Additional Questions And Answers Fill In The Blanks

1. The number of N-N bond in urotropine is _____.

A. 6

B. 4

C. 2

D. 0

Answer: D

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2. Acetone reacting with HCN to form cyanohydrin is _____ type of reaction.

A. Nucleophilic addition

B. Electrophilic substitution

C. Free radical substitution

D. Redox

Answer: A

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3. Reduction of RCHO to RCH_3 by N_2H_4 in C_2H_5ONa is _____ reaction.

A. Stephen reduction

B. Catalytic reduction

C. Clemmensen reduction

D. Wolff-kishner reduction

Answer: D

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4. The reagent that does not react with both acetone and benzaldehyde is _____.

A. Sodium hydrogen suphite

B. Fehling's solution

C. Hydrazine

D. Semicarbazide

Answer: B

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5. The number of carbon atoms in a chain can be increased with _____ reaction.

A. Grignard

B. Cannizaro reaction

C. HVZ

D. Clemmensen

Answer: A

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6. The carbonyl carbon is _____ hybridised.

A. sp

B. sp^2

C. sp^3

D. dsp^2

Answer: B

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7. Ozonolysis of terminal alkenes gives _____ as one of the products.

A. acetone

B. acetaldehyde

C. water

D. formaldehyde

Answer: D

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8. In Etard reaction, conversion of toluene to benzaldehyde is brought about by using _____ as an oxidising agent.

A. alk. $KMnO_4$

B. $KMnO_4 / H^+$

C. $K_2Cr_2O_7 / H^+$

D. CrO_2Cl_2

Answer: D

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9. Esters have a _____ odour.

A. fishy

B. fruity

C. garlic

D. carbolic

Answer: B

Watch Video Solution

10. Reduction of ketone gives _____ .

A. Primary alcohol

B. Secondary alcohol

C. Primary amide

D. Secondary amide

Answer: B

Watch Video Solution

11. An example of pinacol is _____ .

A. $CH_3 - CH_2OH$

B. $\begin{array}{l} CH_3 - OH \\ | \\ CH - OH \\ | \\ CH_2 - OH \end{array}$

C. $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{OH}{|}}{C}} - \overset{\overset{CH_3}{|}}{\underset{\underset{OH}{|}}{C}} - CH_3$

D. both (b) and (c)

Answer: C

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12. Pick out the wrong statement with respect to aldol condensation _____.

A. It is an reversible change

B. Characteristic of compounds having α-hydrogen

C. β-hydroxy aldehyde or ketones are formed

D. Aldol and ketols readily lose water form unsaturated compounds

Answer: A

Watch Video Solution

13. $HCHO + CH_3 - \underset{\underset{O}{||}}{C} - CH_3 \xrightarrow[NaOH]{\text{dil}} \underset{\text{4-hydroxy butan-2-one}}{HO - CH_3 - CH_2 - \underset{\underset{O}{||}}{C} - CH_3}$

is an example of _____ reaction.

A. Claisen Schmidt

B. Cannizaro

C. Aldol

D. Crossed aldol

Answer: D

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14. _____ is used in the manufacture of thermo softening plastic perspex.

A. acetaldehyde

B. acetone

C. acetophenone

D. benzophenone

Answer: B

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15. 6 - 8% solution of acetic acid in water is called _____.

A. Vinegar

B. Glacial acetic acid

C. Formalin

D. Both (a) and (b)

Answer: A

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16. Benzaldehyde condenses with N, N - dimethyl aniline in the presence of strong acid to give _____.

A. Benzal aniline

B. Cinnamic acid

C. Schiff's base

D. Malachite green dye

Answer: D

Watch Video Solution

17. The common and IUPAC name of $HOOC-(CH_2)_4-COOH$ is _____.

A. Glutaric acid, hexanedioc acid

B. Glutaric acid, pentanedioc acid

C. Adipic acid, hexanedioic acid

D. Adipic acid, pentanedioc acid

Answer: C

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18. Carboxylic acids are synthesised from Grignard reagent by the action of _____.

A. CO_2

B. H_2O

C. C_6H_5OH

D. CH_3OH

Answer: A

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19. Partial reduction of acetic acid in the presence of $LiAlH_4$ results in the formation of _____.

A. ethane

B. ethanol

C. ethene

D. ethyne

Answer: B

Watch Video Solution

20. With respect to the reagents given below, pick out the odd one _____.

A. P_2O_3

B. P_2O_5

C. H_2SO_4

D. $K_2Cr_2O_7$

Answer: D

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21. Benzoic acid does not undergo Friedel crafts reaction due _____.

A. resonance in benzene

B. strong deactivating nature of the carboxyl group

C. due to its higher pk_a value

D. All the above

Answer: B

Watch Video Solution

22. Formic acid contains _____ group/s

A. aldehyde

B. carboxylic acid

C. alcohol

D. both (a) and (c)

Answer: B

Watch Video Solution

23. Acid chloride acids are prepared by treating carboxylic acids with _____ .

A. $SOCl_2$

B. PCl_2

C. PCl_3

D. All the above

Answer: D

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24. acid chloride + alcohol $\rightarrow$ $\underline{?}$.

A. acids

B. amides

C. esters

D. amines

Answer: C

Watch Video Solution

25. _____ is used for the treatment of gout

A. Formic acid

B. Acetic acid

C. Acetylchloride

D. Acetic anhydride

Answer: A

Watch Video Solution

26. CH_3CHO and $C_6H_5CH_2CHO$ can be distinguished by _____.

A. Tollens reagent

B. Fehlings solution

C. Benedict

D. Iodoform test

Answer: D

Watch Video Solution

27. Which among the following reactions will not result in the formation of carbon - carbon bond? _____.

A. Friedel Crafts

B. Cannizaro reaction

C. Riemer - Tiemann

D. none of the above

Answer: B

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28. Phenol $\xrightarrow[\text{dust}]{Zn}$ $'X'$ $\xrightarrow[\text{anhy}AlCl_3]{CH_3Cl}$ Y $\xrightarrow[KMnO_4]{\text{alk}}$ Z the product Z is _____.

A. benzaldehyde

B. benzoic acid

C. benzone

D. toluene

Answer: B

Watch Video Solution

29. The most acidic among the following is _____ .

A. p - nitrophenol

B. p - hydroxy benzoic acid

C. o - hydroxy benzoic acid

D. p - toluic acid

Answer: C

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30. The structure that refers methyl phenyl carbinol is _____.

A. $C_6H_5CH_2OH$

B. $C_6H_5COCH_3$

C. $C_6H_5CHOHCH_3$

D. $C_6H_5CH_2CH_3$

Answer: C

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31. The test to distinguish HCOOH and CH_3COOH is/are _____.

A. Tollens reagent test

B. Litmus test

C. Sodium bicarbonate test

D. both (b) and (c)

Answer: A

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32. Grignard reagent on addition with dry ice followed by hydrolysis gives _____.

A. aldehydes and acids

B. only ketones

C. aldehydes and ketones

D. only carboxylic acids

Answer: D

Watch Video Solution

33. Benzoin is _____

A. an α-hydroxy aldehyde

B. β-hydroxy aldehyde

C. β- hydroxy ketone

D. α - hydroxy ketone

Answer: D

Watch Video Solution

34. On fusion with KOH benzophenone undergoes _____, and gives potassium benzoate and _____.

A. disproportionation reacion, toluene

B. condensation reaction, toluene

C. disproportionation reaction, benzene

D. condensation reaction, benzene

Answer: C

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35. The organic compound whose boiling point is 452 K and has the smell of bitter almond is _____.

A. HCHO

B. CH_3CHO

C. C_6H_5CHO

D. $C_6H_5CH_2CHO$

Answer: C

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36. $CH_3CH_2 - CO - CH_2CH_3$, The IUPAC name of the compound is _____

A. 2-butanone

B. 3-pentanone

C. 2-pentanone

D. propanone

Answer: B

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37. Among the halogen acids, the weakest acid is _____.

A. HF

B. HCl

C. TNT

D. HI

Answer: A

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38. $CH_3 - CH_2 - CH_2 - CH_2CHO$ and $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - CHO$ exhibit _____ isomerism.

A. positional

B. geometrical

C. functional

D. chain

Answer: D

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39. Aldehydes and ketones are reduced to hydrocarbons by zinc amalgam and conc. HCl. This is _____ reaction.

A. Clemmenson's reduction

B. Wolff krishner reduction

C. Rosenmmund's reduction

D. catalytic reduction

Answer: A

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40. Complete the reaction

$CH_3CHO \xrightarrow[Conhcl]{Zn/Hg} \underline{'X'} + H_2O$. 'X' is _____

A. CH_3CH_2OH

B. CH_3OH

C. $CH_3 - CH_3$

D. CH_4

Answer: C

Watch Video Solution

41. Propanone is usually characterised by _____

A. Fehling's solution

B. iodoform test

C. Schiff's test

D. Tollen's reagent

Answer: B

Watch Video Solution

42. The compound used in the preparation of triphenyl methane dye is _____

A. methanol

B. phenyl methanal

C. phenyl methanol

D. ethanal

Answer: B

Watch Video Solution

43. $CH_3CH_2CH_2CH_2COOH$ and $CH_3 - \overset{CH_3}{\overset{|}{C}}H - CH_2COOH$ are examples of _____ isomerism.

A. geometrical

B. funcational

C. chain

D. postional

Answer: C

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44. Hydrolysis of _____yields acids.

A. cyanides

B. amides

C. esters

D. All the above

Answer: D

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45. Eletrolysis of aqueous solution of sodium salt of acids giving hydrocarbon is _____ reaction.

A. Knoevenagal

B. HVZ

C. Kolbe's

D. none of the above

Answer: C

View Text Solution

46. Formic acid contains both _____ and _____ groups.

A. $-CHO$ and OH

B. $-CHO$ and $X-O$

C. $-CHO$ and $COOH$

D. $-CHO$ and $-O-$

Answer: C

Watch Video Solution

47. Fenton's reagent is _____

A. H_2O_2 / Fe^{2+}

B. H_2O / Fe^{2+}

C. H_2O_2 / Fe^{3+}

D. H_2O / Fe^{3+}

Answer: A

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48. The common and IUPAC name of $HOOC-(CH_2)_4-COOH$ is _____.

A. oxalic

B. malonic

C. adipic

D. succinic

Answer: D

Watch Video Solution

49. Toluene on oxidation with acidified $KMnO_4$ gives _____ .

A. benzoic acid

B. salicylic acid

C. o-toluic acid

D. anthranilic acid

Answer: A

Watch Video Solution

50. Benzoic acid, when heated with soda lime gives _____

A. C_6H_5COONa

B. $C_6C_5COOC_6H_5$

C. C_6H_6

D. C_6H_5OH

Answer: C

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51. $-COOH$ is _____ directing group.

A. ortho

B. meta

C. para

D. both ortho and para

Answer: B

View Text Solution

52. The chain isomer of 2-methyl propanal is

A. 2-butanone

B. butanal

C. 2-methyl propanol

D. but - 3-ene-2-ol

Answer: B

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53. Tollen's reagent is _____

A. ammoniacal cuprous chloride

B. ammoniacal cuprous oxide

C. ammoniacal silver nitrate

D. ammoniacal silver chloride

Answer: C

Watch Video Solution

54. The compound that does not undergo Cannizaro reaction is:

A. formaldehyde

B. acetaldehyde

C. benzaldehyde

D. trimethyl acetaldehyde

Answer: B

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55. During reduction of aldehydes with hydrazine and C_2H_5ONa the product formed is

A. $R-CN=N-NH_2$

B. $R-C\equiv N$

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

D. $R-CH_3$

Answer: D

Watch Video Solution

56. Aldol is

A. 2-hydroxy butanol

B. 3-hydroxy butanol

C. 3-hydroxy butanal

D. 2-hydroxy butanal

Answer: C

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57. A cyanohydrin of a compound X on hydrolysis gives lactic acid. The X is

A. HCHO

B. CH_3CHO

C. $(CH_3)_2CO$

D. $C_6H_5CH_2CHO$

Answer: B

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58. The compound which does not reduce Fehling's solution is _____

A. formaldehyde

B. acetaldehyde

C. benzaldehyde

D. propionaldehyde

Answer: C

Watch Video Solution

59. $CH_3COCH_3 \xrightarrow{\text{conc.}H_2SO_4}$? The product is _____

A. mesitylene

B. mesity oxide

C. phorone

D. paraldehyde

Answer: A

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60. The compound used in the preparation of the tranquilizer, sulphonal is _____

A. acetone

B. acetophenone

C. isopropyl alcohol

D. glycol

Answer: A

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61. The compound that answers iodoform test is _____

A. CH_3CHO

B. CH_3COCH_3

C. CH_3CH_2OH

D. all of these

Answer: D

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62. The aldehyde derived from vitamin B6 is _____

A. pyridoxal

B. pyridoxine

C. CH_3CHO

D. glyoxal

Answer: A

View Text Solution

63. The common name of 3-phenyl prop - 2 - enal is _____

A. crotonaldehyde

B. salicylaldehyde

C. cinnamaldehyde

D. benzaldehyde

Answer: C

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64. Benzylhydrol is _____

A. phenaceyl bromide

B. methyl carbinol

C. diphenyl carbinol

D. phenyl carbinol

Answer: C

Watch Video Solution

65. $CH_3CH_2OH \xrightarrow{K_2Cr_3O_7 / H^+} \underline{'X'} + H_2O$ 'X' is _____

A. CH_3CHO

B. CH_3COCH_3

C. CH_3COOCH_3

D. CH_3CN

Answer: A

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66. The composition of carbon di oxide in air is _____

A. dsp^2

B. sp^3

C. sp^2

D. sp

Answer: C

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67. Complete the reaction $\begin{matrix} CH_3-CHOH \\ | \\ CH_3-CHOH \end{matrix} \xrightarrow[?]{HIO_4} X$ is _____

A. CH_3COCH_3

B. CH_3CHO

C. C_6H_5CHO

D. $CH_3-\underset{\underset{CH_3}{|}}{C}-CH-CHO$

Answer: B

View Text Solution

68. The compound with α - hydrogen is _____

A. HCHO

B. C_6H_5CHO

C. $C_6H_5COC_6H_5$

D. CH_3COCH_3

Answer: D

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69. A cyanohydrin of a compound X on hydrolysis gives lactic acid. The X is

A. HCHO

B. CH_3CHO

C. $(CH_3)_2CO$

D. $C_6H_5CH_2CHO$

Answer: B

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70. The IUPAC name of phenetole is _____.

A. Phenoxy benzene

B. Ethoxy benzene

C. Methoxy benzene

D. Propoxy benzene

Answer: B

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71. In metal carbonyls, the oxidation state of the metal is _____

A. 0

B. $+2$

C. $+4$

D. $+6$

Answer: A

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72. The acid which reduces Tollen's reagent is

A. acetic acid

B. benzoic acid

C. formic acid

D. oxalic acid

Answer: C

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73. The isomerism exhibited by CH_3CH_2COOH and CH_3COOH_3 is _____

A. metamerism

B. position

C. chain

D. functional

Answer: D

View Text Solution

74. Among the following, the strongest acid is _____

A. $ClCH_2COOH$

B. Cl_3CCOOH

C. CH_3COOH

D. $Cl_2CHCOOH$

Answer: B

View Text Solution

75. The compound which undergoes intramolecular dehydration with P_2O_5 is _____

A. acetic acid

B. formic acid

C. propionic acid

D. butyric acid

Answer: B

View Text Solution

76. Weakest acid among the following is _____

A. acetic acid

B. phenol

C. water

D. acetylene

Answer: D

View Text Solution

77. The IUPAC name of

$CH_3 - CH_2 - \overset{CH_3}{\underset{|}{C}}H - COOH$ is

A. methyl butanoic acid

B. 2-methyl butanoic acid

C. α - methyl butyric acid

D. 3-methyl butanoic

Answer: D

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78. Name the decarboxylating agent .

A. soda lime

B. lime water

C. quick lime

D. lime of milk

Answer: A

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79. The order of reactivity of carboxylic acid derivatives is _____

A. Acid chloride > Ester > Amide > Acid anhydride

B. Acid chloride > Acid anhydride > Ester > Amide

C. Acid chloride > Amide > Acid anhydride > Ester

D. Acid anhydride > Ester > Amide > Acid chloride

Answer: B

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Additional Questions And Answers Assertion Reason

1. Assertion : Fehling solution does not oxidise benzaldehyde to benzoic acid.

Reason : Fehling solution is a alkaline solution of copper sulphate containing Rochelle salt.

A. (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) does not explain (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B

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2. Assertion : Formic acid reduces Tollens reagent.

Reason : Formic acid contains an aldehyde as well as acid group.

A. (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) does not explain (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A

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3. Assertion : Wolf kishner and clemmensen's reagents both bring about the oxidation of aldehydes and ketones.

Reason : Clemmensen's reagent is a powerful oxidising agent

A. (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) does not explain (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: D

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4. Assertion : 100% pure acetic acid is called glacial acetic acid

Reason : Its called so as it forms ice like crystals when cooled.

A. (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) does not explain (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A

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5. Assertion : Trichloro acetic acid is much stronger acid than acetic acid

Reason : Acidity decreases with increasing number of electron withdrawing substituents.

A. (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) does not explain (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: C

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6. Assertion : In Rosenmund reduction acetyl chloride is reduced to alcohol

Reason : $BaSO_4$ acts a positive catalyst in this reaction

A. (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) does not explain (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: D

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7. Assertion : Acid chlorides are preferably prepared from carboxylic acids with $SOCl_2$ as chlorinating agents.

Reason : with $SOCl_2$, the products formed are gases which escape leaving the acid chloride in pure state.

A. (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) does not explain (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A

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8. Assertion : Ethyl benzene and methyl benzene both are oxidised to benzoic acid with acidified $KMnO_4$.

Reason : The entire side chain of aromatic carboxylic acid is oxidised to COOH irrespective of the length of the side chain

A. (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) does not explain (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A

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9. Assertion : pK_a value of acetic acid is lower than that of phenol

Reason : Phenoxide ion is more resonance stabilised than acetate ion

A. (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) does not explain (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: C

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10. Assertion : Ketones are not easily oxidised

Reason : The oxidation of unsymmetrical ketones is governed by Popoff's

rule

A. (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) does not explain (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B

View Text Solution

11. Assertion : Acetaldehyde gives haloform reaction

Reason : Acetaldehyde contains $CH_3 - \underset{\underset{O}{||}}{C} - \text{group.}$

A. (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) does not explain (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A

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Very Short Answer

1. Name one reagent used to distinguish acetaldehyde and acetone.

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2. Give four example of carbonyl compounds?

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3. Does formaldehyde undergo aldol condensation? Justify your answer.

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4. What type of aldehydes undergo Cannizaro reaction?

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5. What is urotropine? Give its use.

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6. What happens when calcium acetate is dry distilled?

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7. What is formalin? Write its use.

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8. Ethanal is more reactive towards nucleophilic addition reaction than propanone. Why?

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9. Write a note on haloform reaction.

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10. Arrange the following in increasing order of reactivity towards nucleophilic addition.

$HCHO, CH_3CHO$ and CH_3COCH_3

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11. Predict the formula of the products in the following reactions.

(i) $CH_3COCH_3 + HCN \rightarrow ?$

(ii) $C_6H_5COCH + NH_2OH \rightarrow$

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12. Mention the industrial use of formaldehyde.

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13. How will you distinguish between formaldehyde and acetaldehyde?

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14. What is aldol condensation?

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15. Give nucleophilic addition reaction of acetaldehyde with (a) $NaHSO_3$, and (b) $LiAlH_4$.

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16. Identify (B), (C) and (D)

$$CH_3 - \overset{\overset{O}{||}}{C} - CH_3(A) \xrightarrow{LiAlH_4} (B) \xrightarrow{SOCl_2} (C) \xrightarrow{\text{alc.}KOH} (D)$$

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17. Give the IUPAC names of

(i) $CH_3 - \underset{\underset{OCH_3}{|}}{CH} - \underset{\underset{O}{|}}{C} - \underset{\underset{CH_3}{|}}{CH} - OCH_2CH_3$

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

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18. Write the structural formula of the main product formed when , (i) The compound obtained by hydration of ethyne is treated with dilute alkali. (ii) Methanal reacts with ammonia.

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19. Write any three uses of acetaldehyde.

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20. Benzaldehyde reduces Tollen's reagent but not Fehling's solution explain.

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21. How is Schiff's base prepared?

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22. Give the IUPAC names of :

(i) $CH_3 - \underset{\underset{OCH_3}{|}}{CH} - \underset{\underset{O}{||}}{C} - \underset{\underset{CH_3}{|}}{CH} - OCH_2CH_3$

(ii) $CH_3 - CO - \underset{\underset{C_2H_3}{|}}{CH} - CH_2 - CH_2 - Cl$

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23. Complete the following reaction

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24. What is DIBAL - H? What is it used for?

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25. Convert hex-4-ennitrile to hex-4-enal.

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26. Write a note on Etard reaction?

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27. Explain Gattermann - Koch reaction.

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28. Write the structural formula of 1, 1 - dimethoxy ethane. How is it prepared from ethanal?

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29. Write the structural formula of

(i) p - methyl benzaldehyde

(ii) 2 - methyl cyclohexanone

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30. Acetone soluble in water but benzophenone is not. Give reason.

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31. Butanol has higher boiling point than Butanal. Justify.

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32. Write the structures of A and B in the following reaction. Name the reaction involved.

$$CH_3COCl \xrightarrow[H_2]{Pd/BaSO_4} A \xrightarrow{NH_2OH} B$$

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33. Write two tests of carboxylic acid.

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34. What are carboxylic acids?

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35. Give the source and trivial names of

(i) C_3H_7COOH and $(ii)HCOOH$.

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36. How is the conversion of acetonitrile to acetic acid effected ?

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37. Give the resonance structure of carboxylate anion.

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38. Mention the inductive effect in monochloro acetic acid.

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39. Write a note on esterification reaction with an example.

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40. How is acetic acid prepared from amides and esters?

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41. What happens when soda lime is treated with (i) CH_3COONa

(ii) C_6H_5COOH ?

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42. Explain HVZ reaction.

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43. Write short note on Kolbe's electrolytic reaction.

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44. Give any three uses of benzoic acid.

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45. Compare the strength of mono, di, trichloro acetic acid.

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46. Write any three uses of formic acid.

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47. Write the structure formula of the following compounds.

(i) 3-bromo-4 phenylpent - 3- enoic acid

(ii) 2-methylbutanoic acid

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48. Draw the structure of 2-methylcyclopent-3-ene-1-carboxylic acid.

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49. Lower aliphatic carboxylic acids are soluble in water where as higher ones are insoluble. Given reason.

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50. What is vinegar?

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51. Name the reagent used in reaction given below.

$$\underset{\text{Sodium acetate}}{CH_3-\overset{\overset{O}{||}}{C}-ONa}+\xrightarrow{?}\underset{\text{Methane}}{CH_4}+Na_2CO_3$$

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52. What is glacial acetic acid? How is it obtained.

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53. Suggest a scheme to convert CH_3CH_2OH into an acid containing 1 more carbon atom.

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54. Write a test to distinguish C_2H_5OH and CH_3COOH.

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55. How will you bring about the conversion of acetic acid to acetamide?

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56. Complete the following reaction and Identify products 'A' and 'B'.

$(CH_3CO)_2O + NH_3 \rightarrow \underline{A} + \underline{B}$

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57. Write note on trans esterification.

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58. Esters are colourless liquids with characteristic fruity smell. Identify the ester which gives the following flavours.

(i) Raspberry

(ii) Pine apple

(iii) Orange

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59. Write any two uses benzoic acid.

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60. Write a note on Claisen Condensation.

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61. Amino acids are amphoteric in nature. Explain.

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62. Name a chemical test to distinguish between the following.

(i) 2-Pentanone, 3-Pentanone

(ii) Acetone, acetaldehyde

(iii) Benzaldehyde, butanal

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Short Answer

1. How is acetaldehyde prepared by the ozonolysis of $CH_3CH = CHCH_3$?

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2. Explain Stephen's reaction.

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3. What is Rosenmund's reduction? What is the purpose of adding $BaSO_4$ in it?

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4. Formaldehyde and benzaldehyde give Cannizaro reaction but acetaldehyde does not - account for this.

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5. Explain the isomerism exhibited by carboxylic acids.

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6. How is ethanoic acid prepared from ethanol? Give the chemical equation.

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7. How are the following conversions carried out ?

(i) benzaldehyde from Toluene, (ii) acetophenone from benzene, and

(iii) benzoin from benzaldehyde.

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8. How are the following conversions carried out ?

(i) benzaldehyde from Toluene, (ii) acetophenone from benzene, and

(iii) benzoin from benzaldehyde.

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9. Write a note on (i) Perkins reaction, and (ii) Knoevenagal reaction.

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10. Write a note on

Knoevenagal reaction.

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11. An organic compound, C_2H_4O gives a red precipitate when warmed with Fehling's solution. It also undergoes aldol condensation in presence of alkali.

(i) Write IUPAC name of the compound.

(ii) What is the hybridization of carbon atoms in the compound ?

(iii) Write equation for the reaction.

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12. What happens when the following compounds are treated with dilute NaOH solution in cold?

propanal

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13. What happens when the following compounds are treated with dilute NaOH solution in cold?

$(CH_3)_3C - CHO$

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14. Write short notes on Propoff's rule.

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15. How will you convert benzaldehyde to

C_6H_5COOH

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16. How will you convert benzaldehyde to

$C_6H_5CH_2OH$

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17. How will you convert benzaldehyde to

$C_6H_5CH_3$

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18. Organic compound with molecular formula C_3H_6O has two isomers (A) and (B). (A) on heating with NaOH in I_2 forms a yellow precipitate while (B) does not. Identify the isomers A and B and explain the reactions.

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19. What is Malachite green dye? Explain its preparation?

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20. Predict the product when calcium ethanoate and calcicum methanote are dry distilled. Explain the reaction.

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21. Formic acid reduces Tollen's reagent, but acetic acid does not-Give reasons.

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22. What is acidity constant? How is it expressed.

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23. Write the structure of 'A' and 'B' in the following reaction.

$$C_6H_5MgBr \xrightarrow[(ii)\ H_2O/H^+]{(i)\ CO_2} A \xrightarrow[FeBr_3]{Br_2} B$$

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24. Complete the following reactions

$$CH_3COCl + NH_2 \rightarrow$$

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25. Complete the following reactions

$$CH_3COCl + C_2H_5OH \rightarrow$$

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26. Give the IUPAC names for the following :

(i) Crotonaldehyde

(ii) Methyl n-propyl ketone

(iii) Phenyl acetaldehyde.

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Long Answer

1. How does formaldehyde react with

NH_3

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2. How does formaldehyde react with

CH_3MgI followed by hydrolysis

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3. How does formaldehyde react with

NaOH

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4. Illustrate the reducing property of acetaldehyde with examples.

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5. Explain the mechanism of Aldol condensation of acetaldehyde.

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6. Which compounds on Clemmenson reduction give

2-methyl propane

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7. Which compounds on Clemmenson reduction give

ethyl benzene

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8. Which compounds on Clemmenson reduction give

propane

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9. Which compounds on Clemmenson reduction give

diphenyl methane

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10. Draw resonance structures for the following

(i) CH_3COO^-

(ii) CH_3CONH_2

(iii) C_6H_5CHO

(iv) $C_6H_5COO^-$

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11. Write the crossed aldol condensation.

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12. Explain the mechanism of Cannizaro reaction.

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13. How does NH_3 react with the following?

HCHO

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14. How does NH_3 react with the following?

CH_3CHO

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15. How does NH_3 react with the following?

C_6H_5CHO

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16. How does NH_3 react with the following?

CH_3COCH_3

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17. Explain why carboxylic acids behave as acids. Discuss briefly the effects of electron withdrawing and donating substituents on acid strength of

carboxylic acids.

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18. Account for reducing nature of Formic acid.

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19. Explain the order of strength of the following acids.

$CCl_3COOH > CHCl_2COOH > CH_2ClCOOH > CH_3COOH$

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20. Explain the order of strength of the following acids.

p-nitrophenol $>$ m-nitrophenol $>$ phenol $>$ cresol

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21. Explain electrophilic substitution reactions of benzoic acid.

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22. How will acetic anhydride react with the following reagents?

HOH

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23. How will acetic anhydride react with the following reagents?

C_2H_5OH

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24. How benzaldehyde is converted to

(i) m-nitrobenzaldehyde

(ii) m-benzaldehyde sulphonic acid

(iii) m-chlorobenzaldehyde

(iv) Benzoyl chloride

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25. Give two tests for aldehydes.

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26. How do you distinguish formic acid from acetic acid?

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27. Explain the mechanism of esterification.

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Problems For Practice

1. An organic compound (A) of molecular formula C_7H_6O is not reduced by Fehling's solution but will undergo Cannizzaro reaction. Compound (A) reacts with aniline to give compound (B). Compound (A) also reacts with Cl_2 in the presence of catalyst to give compound (C). Identify (A), (B) and (C) and explain the reactions.

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2. An organic compound A (C_7H_6O) reduces Tollen's reagent. On treating with an alkali compound A forms B and C. B on treating with sodalime forms benzene and C (C_7H_8O) is an antiseptic. Identify compounds A, B and C. Explain the reactions.

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3. An organic compound A (C_7H_6O) forms a bisulphite. A when treated with alcoholic KCN forms B $(C_{14}H_{12}O_2)$ and A on refluxing with sodium

acetate and acetic anhydride forms an acid C $(C_9H_8O_2)$. Identify A, B and C. Explain the conversion of A to B and C.

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4. An aromatic aldehyde (A) of molecular formula C_7H_6O which has the smell of bitter almonds on treatment with $(CH_3CO)_2O$ and CH_3COONa to give compound (B) which is an aromatic unsaturated of acid. (A) also reacts with (A) in the presence of alc. KCN to give dimer (C). Identify (A), (B) and (C). Explain the reactions.

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5. An organic compound (A) C_7H_8, on oxidation at 773K in the presence of V_2O_5 gives compound (B) of molecular formula C_7H_6O. (B) reduces Tollen's reagent. (B) on heating with sodium acetate in the presence of acetic anhydride gives $(C_9H_8O_2)$. Identify A, B and C. Write the reactions.

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6. Compound A with molecular formula C_7H_6O reduces Tollen's reagent and also gives Cannizaro reaction. A on oxidation gives the compound B with molecular formula $C_7H_6O_2$. Calcium salt of B on dry distillation gives the compound C with molecular formula $C_{13}H_{10}O$. Find A, B and C. Explain the reaction.

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7. Compound A having the molecular formula C_2H_4O reduces Tollen's reagent. A on treatment with HCN followed by hydrolysis gives the compound B with molecular formula $C_3H_6O_3$. Compound B on oxidation by Fenton's reagent gives the compound C with the molecular formula $C_3H_4O_3$. Find A, B and C. Explain the reactions.

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8. An aromatic compound (A) with molecular formula C_7H_6O has the smell of bitter almonds. (A) reacts with Cl_2 in the absence of catalyst to give (B) and in the presence of catalyst compound (A) reacts with chlorine to give (C). Identify (A), (B) and (C). Explain the reactions.

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9. An organic compound (A) C_2H_3OCl on treatment with Pd and $BaSO_4$ gives (B) C_2H_4O which answers iodoform test. (B) when treated with conc. H_2SO_4 undergoes polymerisation to give (C) a cyclic compound. Identify (A), (B) and (C) and explain the reactions.

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10. Compound (A) of molecular formula C_7H_8 when treated with air in presence of V_2O_5 at 773 K gives a compound (B) of molecular formula C_7H_6O, which has the smell of bitter almonds. Alkaline $KMnO_4$ oxidises compound (B) to (C) of molecular formula $C_7H_6O_2$. Compound (B) on

treatment with N_2H_4 and KOH gives back compound (A). Identify (A), (B) & (C) and explain the reactions.

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11. An organic compound (A) with molecular formula C_3H_6O undergoes iodoform reaction. Two molecules of compound (A) react with dry HCl to give compound (B) $(C_6H_{10}O)$. Compound (B) reacts with one more molecule of compound (A) to give compound (C) $(C_9H_{14}O)$. Identify (A), (B) and (C). Explain the reactions.

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12. Compound A of molecular formula C_3H_6O does not reduce Tollen's reagent and Fehling's solution. Compound A undergoes Clemmensed reduction to give compound B of molecular formula C_3H_8. Compound A in the presence of conc. H_2SO_4 condenses to give an aromatic compound C of molecular formula C_9H_{12}. Identify A, B and C. Explain the reactions.

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13. An organic compound A (C_2H_3N) on reduction with $SnCl_2/HCl$ gives B (C_2H_4O) which reduces Tollen's reagent. Compound B on reduction with N_2H_4/C_2H_5ONa gives C (C_2H_6). Identify the compound A, B and C. Explain the reactions involved.

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14. Compound (A) with molecular formula C_2H_4O reduces Tollen's reagent. (A) on treatment with HCN gives compound (B). Compound (B) on hydrolysis with an acid gives compound (C) with molecular formula C_3H_6O which is an optically active compound. Compound (A) on reduction with N_2H_4/C_2H_5ONa gives a hydrocarbon (D) of molecular formula C_2H_6. Identify (A), (B), (C) and (D) and explain the reactions.

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15. An organic compound (A) of molecular formula C_7H_6O is called as oil of bitter almonds. (A) on oxidation gives (B) of molecular formula $C_7H_6O_2$ which gives brisk effervescence with aqueous alcoholic KCN, compound (C) is formed. Identify A, B and C and write the equations.

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16. An organic compound (A) of molecular formula C_7H_8 on oxidation with air and in presence of $V_2)O_5$ to form (B) of molecular formula C_7H_6O. (B) on reduction with lithium aluminium hydride to form (C) of molecular formula C_7H_8O. Identify (A), (B) and (C) and explain the reactions.

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17. An organic compound (A) C_7H_6O reduces Tollen's reagent. Compound (A) reacts with acetic anhydride in the presence of anhydrous sodium acetate and gives an unsaturated acid (B). Compound (A) reacts with

acetone in the presence of alkali and gives (C). What are (A), (B) and (C)? Explain the reactions.

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18. An organic compound A of molecular formula C_3H_6O answer iodoform test. Another organic compound B of molecular formula C_7H_6O is known as oil of bitter almonds. A reacts with B to form an unsaturated compound C of molecular formula $C_{10}H_{10}O$. Compound B reacts with malonic acid in the presence of pyridine to form an unsaturated acid D of molecular formula $C_9H_8O_2$. Identify A, B, C and D. Explain the reactions.

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19. Compound (A) with Molecular formula C_7H_6O does not reduce Fehling's solution. Compound (A) reacts with acetone in the presence of NaOH to give a compound (B), which is an α, β-unsaturated compound. Further (A) reacts with dimethyl aniline in the presence of conc. H_2SO_4

to give compound (C) which is a dye. Identify (A), (B) and (C). Explain the reactions.

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Unit Test Choose The Correct Answer

1. $CH_2 = CH_2 \xrightarrow[\text{ii) } Zn/H_2O]{\text{i) } O_3} X \xrightarrow{NH_3} Y$ 'Y' is

A. Formadelyde

B. diacetoneammonia

C. hexamethylenetetraamine

D. oxime

Answer:

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2. Which one of the following reduces tollens reagent

A. formic acid

B. acetic acid

C. benzophenone

D. none of these

Answer:

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3. Isopropyl alcohol vapours react with air over silver catalyst at 520 K give

A. tert.butyl alcohol

B. acetaldehyde

C. acetone

D. 2-propanol

Answer:

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4. Calcium acetate + calcium benzoate $\xrightarrow{\text{distillation}}$ gives

A. benzophenone

B. benzaldehyde

C. acetophenone

D. phenyl benzoate

Answer:

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Unit Test Very Short Answer

1. How is propanoic acid is prepared starting from an alkylhalide

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2. What is formalin? Write its use.

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Unit Test Short Answer

1. Write the structure of the major product of the aldol condensation of benzaldehyde with acetone.

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Unit Test Long Answer

1. Explain the mechanism of Aldol condensation of acetaldehyde.

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