CHEMISTRY

BOOKS - MTG WBJEE CHEMISTRY (HINGLISH)

ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

Wb Jee Workout Category 1 Single Option Correct Type

1. The reagent with which both acetaldehyde and acetone react easily is

A. Fehling solution

B. Grignard reagent

C. Schiff's reagent

D. Tollens' reagent.

Answer: B

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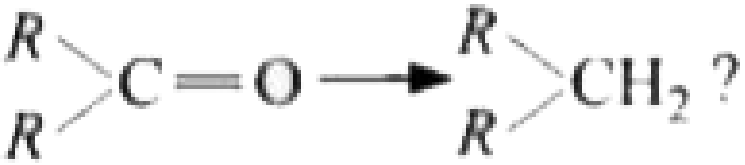
2. Which one of the following reactions cannot be used for the reduction of



A. Clemmensen reaction

B. Wolff – Kishner reaction

C. Wurtz reaction

D. HI and red phosphorus at $150^\circ C$

Answer: C

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3. Clemmensen reduction of a ketone is carried out in presence of

A. H_2 with Pd as catalyst

B. $NH_2NH_2.\ H_2O$ / glycol with KOH

C. $LiAlH_4$ in ether

D. Zn – Hg and HCl.

Answer: D

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4. The well known urinary antiseptic urotropine is formed when formaldehyde reacts with

A. NH_2OH

B. NH_3

C. NH_2NH_2

D. $C_6H_5NHNH_2$.

Answer: B

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5. The general order of reactivity of carbonyl compounds towards nucleophilic addition reaction is

A. $H_2C=O > RCHO > ArCHO > R_2C=O > Ar_2C=O$

B. $ArCHO > Ar_2C=O > RCHO > R_2C=O > H_2C=O$

C. $Ar_2C=O > R_2C=O > ArCHO > RCHO > H_2C=O$

D. $H_2C=O > R_2C=O > Ar_2C=O > RCHO > ArCHO$

Answer: A

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6. Which of the following will give Cannizzaro reaction?

A. CH_3CHO

B. CH_3COCH_3

C. $(CH_3)_3CCHO$

D. CH_3CH_2CHO

Answer: C

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7. Formaldehyde reacts with NaOH (50%). Which one pair of products will be obtained?

A. $CH_3COOH + CH_3OH$

B. $CH_3OH + CH_3COONa$

C. $CH_3COOH + C_2H_5OH$

D. $HCOONa + CH_3OH$

Answer: D

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8. The Cannizzaro reaction is not given by

A. trimethylacetaldehyde

B. acetaldehyde

C. benzaldehyde

D. formaldehyde.

Answer: B

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9. Which of the following compounds is oxidised to prepare ethyl methyl ketone?

A. 2-Propanol

B. 1-Butanol

C. 2-Butanol

D. t-Butyl alcohol

Answer: C

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10. The most suitable reagent for the conversion of $RCH_2OH \rightarrow RCHO$ and obtain good yield is

A. $KMnO_4$

B. $K_2Cr_2O_7$

C. CrO_3

D. PCC (pyridinium chlorochromate)

Answer: D

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11. Which one of the following can be oxidised to the corresponding carbonyl compound?

A. 2-Hydroxypropane

B. o-Nitrophenol

C. Phenol

D. 2-Methyl-2-hydroxypropane

Answer: A

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12. Acetone is heated with bleaching powder to give

A. chloroform

B. acetaldehyde

C. ethanol

D. phosgene.

Answer: A

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13. The IUPAC name of $CH_3COCH(CH_3)_2$ is

A. 3-methyl-2-butanone

B. Isopropyl methyl ketone

C. 2-methyl-3-butanone

D. 4-methyl isopropyl ketone.

Answer: A

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14. Which of the following compound will forms 2 isomeric oximes on reacting with NH_2OH ?

A. RCHO

B. RCOR

C. HCHO

D. PhCOPh

Answer: A

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15. The correct order of decreasing acid strength of trichloroacetic acid (A), trifluoroacetic acid (B), acetic acid (C) and formic acid (D) is

A. $A > B > C > D$

B. $A > C > B > D$

C. $B > A > D > C$

D. $B > D > C > A$

Answer: C

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16. Which reaction is suitable for the preparation of α-chloroacetic acid?

A. Hell - Volhard Zelinsky reaction

B. Nef reaction

C. Stephen reaction

D. Perkin condensation

Answer: A

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17. $\left[Ag(NH_3)_2OH\right]$ liberates silver when it reacts with

A. HCOOH

B. CH_3COOH

C. CH_3COCH_3

D. CH_3OH

Answer: A

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18. In the anion $RCOO^-$, the two carbon -oxygen bonds are found to be of equal length. What is the reason for it?

A. The anion is obtained by removal of a proton from the acid molecule.

B. Electronic orbitals of carbon atom are hybridised.

C. The C=O bond is weaker than the C-O bond.

D. The anion $RCOO^-$ has two resonating structures.

Answer: D

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19. The Pk_a value of the C-H acids $HC \equiv CH$ (I), $MeCOCH_2COOEt$ (II), MeCOOEt (III) and PhMe (IV) decreases as

A. $I > III > IV > II$

B. $II > IV > III > I$

C. $IV > III > I > II$

D. $I > IV > III > II$

Answer: C

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20. Which one of the following reacts with Grignard reagent to form an addition product which can be hydrolysed to a carboxylic acid?

A. O_2

B. CO_2

C. SO_2

D. None of these

Answer: B

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21. A halogen compound A on hydrolysis with dilute alkali followed by acidification gives acetic acid. The compound X is

A. $ClCH_2CH_2Cl$

B. CH_3CHCl_2

C. $ClCH_2CHCl_2$

D. CH_3CCl_3

Answer: D

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22. Which one of the following compounds is most reactive towards nucleophilic addition?

A. CH_3CHO

B. $PhCOCH_3$

C. PhCOPh

D. CH_3COCH_3

Answer: A

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23. Distillation of acetone with conc. sulphuric acid gives

A. diacetone alcohol

B. mesityl oxide

C. mesitylene

D. propene-2-ol.

Answer: C

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24. Which one of the following pairs will gives effervescence with aq. $NaHCO_3$?

CH_3COCl (I) $\quad$ CH_3COCH_3 (II)

CH_3COOCH_3 (III) $\quad$ $CH_3COOCOCH_3$ (IV)

A. I & II

B. I & IV

C. II & III

D. I & III

Answer: B

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25. In which of the following reactions new carboncarbon bond is not formed?

A. Cannizzaro reaction

B. Wurtz reactio

C. Aldol condensation

D. Friedel-Crafts reaction

Answer: A

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26. For making distinction between 2-pentanone and 3-pentanone the reagent to be employed is

A. $K_2Cr_2O_7 / H_2SO_4$

B. $Zn - Hg / HCl$

C. SeO_2

D. Iodine / $NaOH$

Answer: D

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27. Reaction of formaldehyde and ammonia gives

A. hexamethylene tetramine

B. bakelite

C. urea

D. triethylene tetramine.

Answer: A

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28. Which of the following compounds is not formed in iodoform reaction of acetone?

A. CH_3COCH_2I

B. ICH_2COCH_2I

C. CH_3COCHI_2

D. CH_3COCI_3

Answer: B

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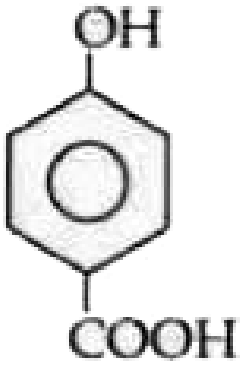
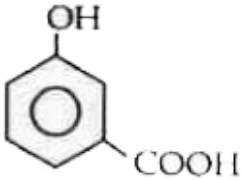
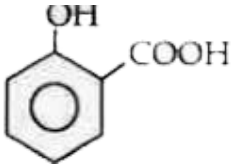
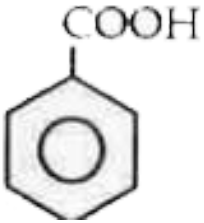
29. Which of the following compounds has maximum volatility?

A. 

B. 

C. 

D. 

Answer: C

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30. Identify the method by which Me_3CCO_2H can be prepared.

A. Treating 1 mol of MeCOMe with 2 moles of MeMgI.

B. Treating 1 mol of $MeCO_2Me$ with 3 moles of MeMgI followed by hydrolysis.

C. Treating 1 mol of MeCHO with 3 moles of MeMgI.

D. Treating 1 mol of dry ice with 1 mol of Me_3CMgl followed by hydrolysis.

Answer: D

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Wb Jee Workout Category 2 Single Option Correct Type

1. Anorganic compound A on treatment with ainmnoniacal silver nitrate gives metallic silver and produces a yellow crystalline precipitate of

molecular formula $C_9H_{10}N_4O_4$, on treatment with Brady's reagent. Give the structure of the organic compound A.

A. CH_3CHO

B. CH_3COCH_3

C. CH_3CH_2CHO

D. $CH_3CH_2\underset{\underset{O}{||}}{C}-CH_3$

Answer: C

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2. Compound A treated with $NaNH_2$ followed by CH_3CH_2Br gave compound B. Partial hydrogenation of compound B produced compound C, which on ozonolysis gave a carbonyl compound D, (C_3H_6O). Compound D did not respond to iodoform test with I_2/KI and NaOH. Find ont the structure of C.

A. $CH_3-CH_2-CH_2-CH=CH-CH_3$

B. $CH_3 - CH_2 - CH = CH - CH_2 - CH_3$

C. $CH_3 - C \equiv C - CH_2 - CH_2 - CH_3$

D. $CH_3 - CH_2 - C \equiv C - CH_2 - CH_3$

Answer: B

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3. A compound A has molecular formula C_2Cl_3OH. It reduces Fehling's solution and on oxidation gives a monocarboxylic acid B. A is obtained by the action of Cl_2 on ethyl alcohol. A is

A. chloral

B. chloroform

C. chloromethane

D. chloroacetic acid.

Answer: A

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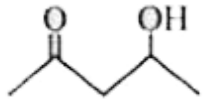
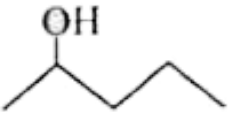
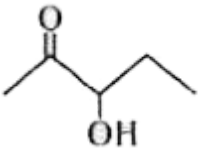
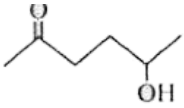
4. Which of the following will he most readily dehydrated in acidic conditions?

A. 

B. 

C. 

D. 

Answer: A

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5. Which one of the following pairs is not correctly matched?

A. $> C = O \rightarrow \underset{\text{Clemmensen reduction}}{} > CH_2$

B. $C = O \rightarrow \underset{\text{Wolff-Kishner reduction}}{} > CHOH$

C. $COCl \rightarrow \underset{\text{Rosenmund reduction}}{} -CHO$

D. $-C \equiv N \rightarrow \underset{\text{Stephen reduction}}{} -\text{C H O}$

Answer: B

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6. Compound A (molecular formula C_3H_8O) is treated with acidified potassium dichromate to form a product B (molecular formula C_3H_6O), B forms a shining silver mirror on warming with ammoniacal silver nitrate. B when treated with an aqueous solution of $H_2NCONHNH_2.HCl$ and sodium acetate gives a product C. Identify the structure of C.

A. $CH_3CH_2CH = NNHCONH_2$

B. $CH_3 - \underset{\underset{CH_3}{|}}{C} = NCONHNH_2$

C. $CH_3 - \underset{\underset{CH_3}{|}}{C} = NCONHNH_2$

D. $CH_3CH_2CH = NCONHNH_2$

Answer: A

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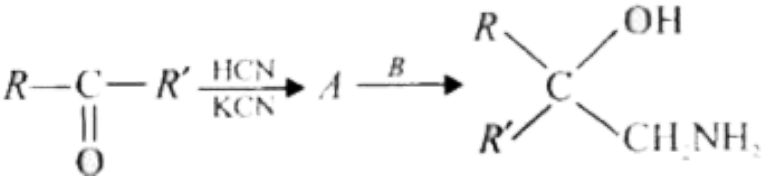
7. A and B in the following reactions are :



A. $A = \begin{matrix} R \\ R' \end{matrix}\!\!>\!C\!<\!\begin{matrix} OH \\ COOH \end{matrix}$, $B = NH_3$

B. $A = \begin{matrix} R \\ R' \end{matrix}\!\!>\!C\!<\!\begin{matrix} CN \\ OH \end{matrix}$, $B = H_3O^+$

C. $A = \begin{matrix} R \\ R' \end{matrix}\!\!>\!CH_2CN$, $B = NaOH$

D. $A = \begin{matrix} R \\ R' \end{matrix}\!\!>\!C\!<\!\begin{matrix} CN \\ OH \end{matrix}$, $B = LiAlH_4$

Answer: D

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8.

$$CH_3CHO + HCN \rightarrow CH_3CH(OH)CN \xrightarrow{H^+ / H_2O} CH_3CH(OH)COOH$$

an asymmetric centre is generated. The acid obtained would be

A. D-isomer

B. L-isomer

C. 50% D + 50%L

D. 20% D + 80% L.

Answer: C

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9. The end product (B) in the following reaction sequenice is

$$CH_3OH \xrightarrow[300^\circ C]{Cu} A \xrightarrow{NaOH} B$$

A. alkane

B. carboxylic acid

C. sodium salt of carboxylic acid

D. ketone

Answer: C

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10. $CH_3CH_2COOH \xrightarrow[\text{red P}]{Cl_2} A \xrightarrow{Alc.KOH} B$

What is B?

A. CH_3CH_2COCl

B. CH_3CH_2CHO

C. $CH_2 = CHCOOH$

D. $ClCH_2CH_2COOH$

Answer: C

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11. In the set of the given reactions, acetic acid yielded a product C.

$$CH_3COOH \xrightarrow{PCl_5} A \xrightarrow[anh.\,AlCl_3]{C_6H_6} B \xrightarrow[\text{ether}]{C_2H_5MgBr} C$$

The product C would be

A. $CH_3CH(OH)C_2H_5$

B. $CH_3COC_6H_5$

C. $CH_3CH(OH)C_6H_5$

D. $CH_3 - \overset{C_2H_5}{\underset{|}{C}}(OH)C_6H_5$

Answer: D

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12. Consider the following reaction

$$RCOO^-Ag^+ \xrightarrow{Br_2} RBr + AgBr + CO_2$$

The given reaction is known as X reaction and proceeds via a Y intermediate 'X' and 'Y' stand respectively for

A. Hell-Volhard Zelinsky, carbanion

B. Sandmeyer, free radical

C. Wolff-Kishner, carbene

D. Hunsdiecker, free radical.

Answer: D

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13. The end product C in the following sequence of chemical reactions is

$$CH_3COOH \xrightarrow{CaCO_3} A \xrightarrow{\text{heat}} B \xrightarrow{NH_2OH} C$$

A. acetaldehyde oxime

B. formaldehyde oxime

C. methyl nitrate

D. acetoxime.

Answer: D

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14. In the following reaction sequence,

$$C_6H_5Br \xrightarrow[523K]{CuCN\ /\ \text{pyridine}} X \xrightarrow[\text{boil}]{dil.\ H_2SO_4} Y$$

the product Y is

A. benzonitrile

B. benzene

C. benzoic acid

D. benzamide.

Answer: C

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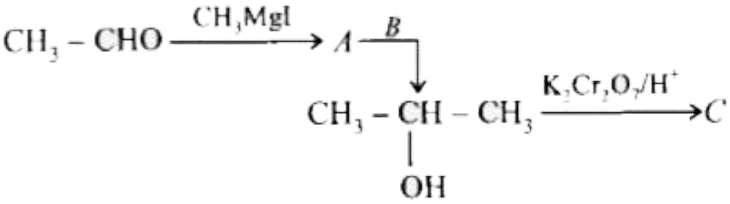
15. Identify C in the following reaction.



A. CH_3CHO

B. CH_3COCH_3

C. $CH_3CH_2COCH_3$

D. CH_3CH_2CHO

Answer: B

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Wb Jee Workout Category 3 One Or More Than One Option Correct Type

1. Which one of the following is produced when acetone is saturated with HCl gas?

A. Acetone alcohol

B. Phorone

C. Mesityl oxide

D. Benzene

Answer: B::C

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2. Which of the following reactions are Claisen condensation?

A. $C_6H_5 - CH = O \xrightarrow{CH_3 - \overset{\overset{O}{||}}{C} - OC_2H_5 / OH^-}$

B. $C_6H_5 - CH = O \xrightarrow{CH_3 - COOC_2H_5 / OH^-}$

C. $C_6H_5 - CH = O \xrightarrow{CH_3 - \overset{\overset{O}{||}}{C} - OC_6H_5 / OH^-}$

D. $C_6H_5 - CH = O \xrightarrow{OH^-}$

Answer: A::B::C

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3. Which of the following reactions will give cinnamic acid?

A. $C_6H_5CH=O \xrightarrow[H_3\overset{+}{O}]{(CH_3CO)_2O/CH_3COONa}$

B. $C_6H_5CH=O \xrightarrow[H_3\overset{+}{O}]{(CH_3)CH=O/OH^-}$

C. $C_6H_5CH=O \xrightarrow[H_3\overset{+}{O}]{(CH_2COOC_2H_5)_2/\text{pyridine}}$

D. $C_6H_5COOC_2H_5=O \xrightarrow{H_3\overset{+}{O}}$

Answer: A::C

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4. Which of the following will give aldchyde only?

A. Ozonolysis of alkene

B. Rosenmund's reaction

C. Stephen's reaction

D. Hydration of alkyne.

Answer: B::C

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5. Select the correct combination of reactions.

A. $CH_3-\overset{\overset{O}{||}}{C}-CH_3 \xrightarrow[HCl]{Zn-Hg}$, Wolf-Kishner reduction

B. $CH_3-\overset{\overset{O}{||}}{C}-C_2H_5 \xrightarrow[KOH\,/\,\text{Ethylene glycol}\,/\,\Delta]{NH_2NH_2}$, Clemmensen reduction

C. $CH_3-\overset{\overset{O}{||}}{C}-Cl \xrightarrow[Pd-BaSO_4]{H_2}$, Rosenmund reduction

D. $CH_3-CN \xrightarrow[HCl\,/\,\overset{+}{H_3O}]{SnCl_2}$, Stephen reaction

Answer: C::D

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6. Base-catalysed aldol condensation occurs with

A. Propionaldehyde

B. Benzaldehyde

C. 2-methylpropionaldehyde

D. 2,2-dimethylpropionaldehyde.

Answer: A::C

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7. Which of the following are examples of aldol condensation?

A. $2CH_3CHO \xrightarrow{dil.NaOH} CH_3CHOHCH_2CHO$

B. $2CH_3COCH_3 \xrightarrow{dil.NaOH} CH_3C(OH)(CH_3)CH_2COCH_3$

C. $2HCHO \xrightarrow{dil.NaOH} CH_3OH + HCOOH$

D. $C_6H_5CHO + HCHO \xrightarrow{dil.NaOH} C_6H_5CH_2OH$

Answer: A::B

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8. The products obtained in the following reaction are

$$\begin{matrix} CHO \\ 2| \\ COOH \end{matrix} \xrightarrow[\Delta]{NaOH}$$

A. $\begin{matrix} CH_2OH \\ | \\ COONa \end{matrix}$

B. $\begin{matrix} CH_2OH \\ | \\ CH_2OH \end{matrix}$

C. $\begin{matrix} COONa \\ | \\ COONa \end{matrix}$

D. $CH_3 - CH_3$

Answer: A::C

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9. Which of the following compounds will give red precipitate when heated with Fehling's solution?

A. $R-\overset{\overset{OH}{|}}{C}H-\overset{\overset{O}{||}}{C}-CH_2-R$

B. C_6H_5CHO

C. HCOOH

D. $CH_3COCH_2COCH_3$

Answer: A::C

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10.

$PhCH_2CH_2COOH \xrightarrow{Ag_2O} PhCH_2CH_2COOAg \xrightarrow{Br_2} PhCH_2CH_2Br + CO$

The reaction is known as Hunsdiecker reaction. Choose incorrect statement(s) regarding the Hunsdiecker reaction.

A. A more convenient way to preform the Hunsdiecker reaction is the use of a mixture of acid and mercuric oxide.

B. Reaction involves radical intermediates.

C. The yield of bromide increases as $1^{\circ}\,\text{alkyl} < 2^{\circ}\,\text{alkyl} < 3^{\circ}\,\text{alkyl}$.

D. The reaction starts with decarboxylation.

Answer: C::D

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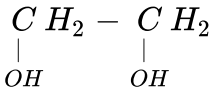
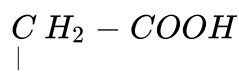
11. When one mole of an organic compound X is reacted with an excess of PCl_5 then two moles of hydrogen chloride are formed. Which of the following compounds could be X?

A. 

B. $C_6H_5CH=O$

C. 

D. 

Answer: A::C

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12. Which of the following reagents will reduce a carboxylic acid to a 1°-alcohol under mild conditions?

A. BH_3 – ether

B. $NaBH_4, CH_3CH_2OH$

C. H_2 and Pt catalyst

D. $LiAlH_4$ in ether

Answer: A::D

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13. Which of the following method(s) would be useful for preparing ketones?

A. Friedel-Crafts reaction of an acyl chloride with benzene ($AICI_3$ catalysis).

B. Reaction of methyllithiumn with the lithium salt of carboxylic acid, followed by hydrolysis.

C. Reaction of R_2CuLi with an acyl chloride in ether at low temperature.

D. Reaction of Grignard reagents with acyl chloride in ether followed by hydrolysis.

Answer: A::B::C

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14. The product (A) of following reaction

$$CH_3COOH \xrightarrow[2.\Delta]{1.Ca(OH)_2} (A)$$

A. reduced Fehling's solution

B. forms an oxime

C. does not react with Tollens' reagent

D. add to $CHCl_3$

Answer: B::C::D

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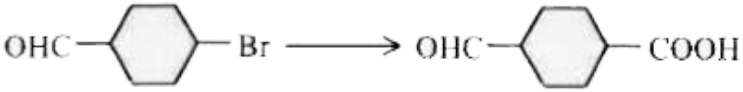
15. Which of the following reagents are used in the conversion of



A. Mg / dry ether

B. $HCHO / CrO_3$

C. CO_2 / H_3O^+

D. CH_3COOH

Answer: A::C

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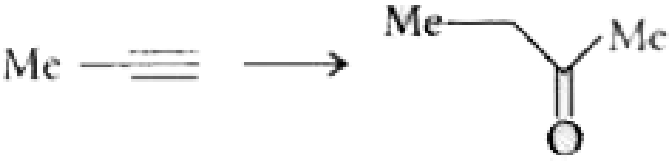
Wb Jee Previous Years Questions Category 1 Single Option Correct Type

1. The reagents to carry out the following conversion are



A. $HgSO_4 / dil.\ H_2SO_4$

B. $BH_3,\ H_2O_2 / NaOH$

C. $OsO_4,\ HIO_4$

D. $NaNH_2 / CH_3I,\ HgSO_4 / dil.\ H_2SO_4$

Answer: D

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2. In the following reaction, the product E is

$$\begin{array}{l} CHO \\ | \\ CHO \end{array} \xrightarrow[2.H^+]{1.NaOH} E$$

A. $\begin{array}{l} CH_2OH \\ | \\ CHO \end{array}$

B. $\begin{array}{l} CHO \\ | \\ CO_2H \end{array}$

C. $\begin{array}{l} CH_2OH \\ | \\ CO_2H \end{array}$

D. $\begin{array}{l} CO_2H \\ | \\ CO_2H \end{array}$

Answer: C

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3. Among the following compounds, the one(s) that gives (give) effervescence with aqueous $NaHCO_3$ solution is (are)

$\underset{I}{(CH_3CO)_2O}$ $\underset{II}{CH_3COOH}$

$\underset{III}{PhOH}$ $\underset{IV}{CH_3COCHO}$

A. I and II

B. I and III

C. only II

D. I and IV

Answer: A

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4. Amongst the following compounds, the one that $Me_2\ddot{N}$will not respond to Cannizzaro reaction upon treatment with alkali is

A. Cl_3CCHO

B. Me_3CCHO

C. C_6H_5CHO

D. HCHO

Answer: A

View Text Solution

5. Amongst the following compounds the one which would not respond to iodoform test is

A. $CH_3CH(OH)CH_2CH_3$

B. $ICH_2COCH_2CH_3$

C. CH_3COOH

D. CH_3CHO

Answer: C

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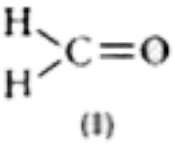
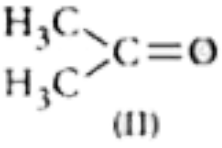
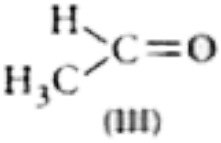
6. The correct order of reactivity for the addition reaction of the following carbonyl compounds with ethyl magnesium iodide is



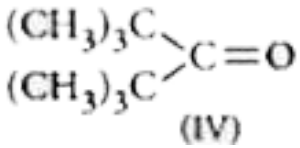
(I)



(II)



(III)



(IV)

A. $I > III > II > IV$

B. $IV > III > II > I$

C. $I > II > IV > III$

D. $III > II > I > IV$

Answer: A

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7. The compound, which evolves carbon dioxide on treatment with aqueous solution of sodium bicarbonate at $25^\circ C$, is

A. C_6H_5OH

B. CH_3COCl

C. CH_3CONH_2

D. $CH_3COOC_2H_5$

Answer: B

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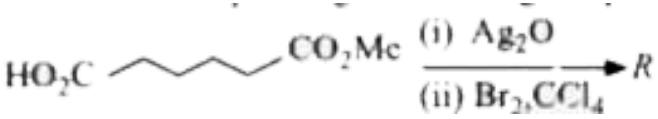
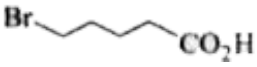
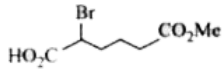
Wb Jee Previous Years Questions Category 2 Single Option Correct Type

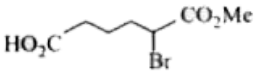
1. The reaction sequence given below gives product R.

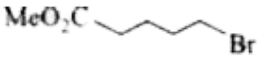


The structure of the product R is

A. 

B. 

C. 

D. 

Answer: D

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2. $[P] \xrightarrow{Br_2} C_2H_4Br_2 \xrightarrow[NH_3]{NaNH_2} [Q] \xrightarrow[Hg^{2+},\ \Delta]{20\%\ H_2SO_4} [R] \xrightarrow{Zn-Hg\ /\ HCl} [S]$

The species P, Q, R and S respectively are

A. ethene, ethyne, ethanal, ethane

B. ethane, ethyne, ethanal, ethene

C. ethene, ethyne, ethanal, ethanol

D. ethyne, ethane, ethene, ethanal.

Answer: A

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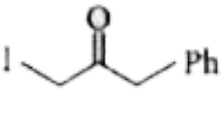
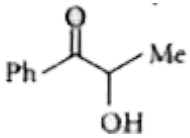
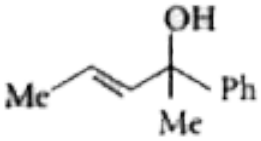
Wb Jee Previous Years Questions Category 3 One Or More Than One Option Correct Type

1. Haloform reaction with l_2 and KOH will be responded by

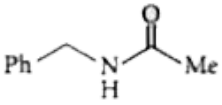
A. 

B. 

C.



D.



Answer: A::B

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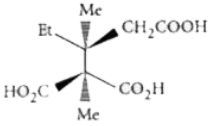
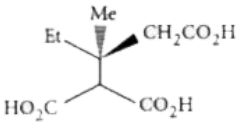
2. The compound(s), capable of producing achiral compound on heating at $100^{\circ} C$ is/are

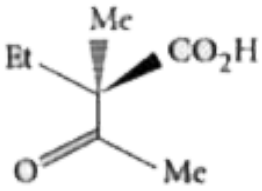
A.



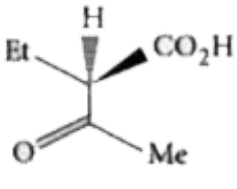
B.



C.



D.



Answer: D

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