CHEMISTRY

BOOKS - BRILLIANT PUBLICATION

HYDROCARBON

Level L Homework

1. Which of the following is not true about cis and trans but-2-ene

A. They have different physical properties

B. They have different orientations in space

C. They have different connectivity of atoms

D. They are non-interconvertible

Answer:

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2. $CH_2 = CH - CH = CH_2 + CCl_3Br \rightarrow \text{Product.}$ The major product is

A. $Br - CH_2 - CH = CH - CH_2 - \text{CCl}_3$

B. $CH_2 = CH - \underset{\text{CCl}_3}{\underset{|}{CH}} - CH_2 - Br$

C. $CH_2 = CH - \underset{Br}{\underset{|}{CH}} - CH_2 - \text{CCl}_3$

D. None of these

Answer:

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3. The most stable conformer of $\underset{CH_2 - F}{\underset{|}{C}}\ H_2 - OH$ is

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4. Propyne and propene can be distinguished by : con. H_2SO_4, Br_2 in CCI_4, Dil. $KMnO_4$, $AgNO_3$ in NH_3

A. con. H_2SO_4

B. Br_2 in CCI_4

C. Dil. $KMnO_4$

D. $AgNO_3$ in NH_3

Answer:

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5. The addition of propene with HOCl proceeds via the addditon of

A. H^+ in first step

B. CI^+ in first step

C. OH^- in first step

D. CI^- and OH^- in single step

Answer:

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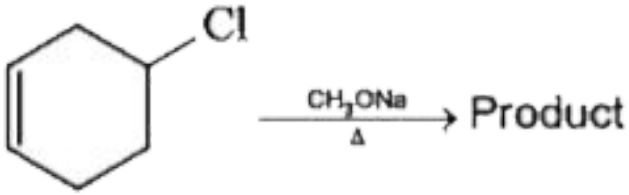
6. The following reaction proceeds by which mechanism?



A. S_N1

B. S_N2

C. $E2$

D. $E1$

Answer:

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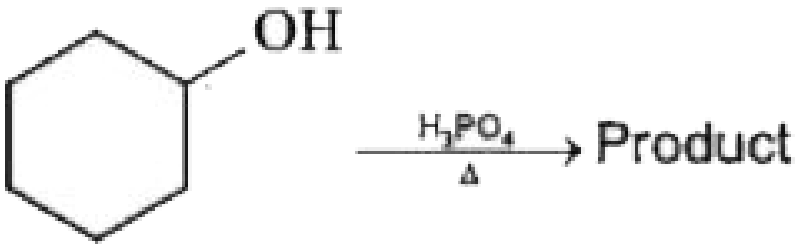
7. The following reaction proceeds by which mechanism?



A. S_N1

B. S_N2

C. $E2$

D. $E1$

Answer:

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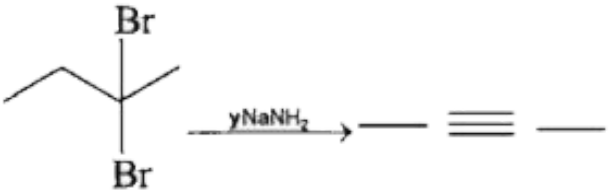
8. $Ph - \overset{\overset{Br}{|}}{\underset{\underset{Br}{|}}{C}} - CH_3 \xrightarrow{xNaNH_2} A \xrightarrow{CH_3I} Ph - C \equiv C - CH_3$



The sum of x and y is

A. 2

B. 4

C. 5

D. 6

Answer:

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9. Which H is more easily substituted by a halogen in the compound

$$\underset{P}{C}H_3 - \underset{Q}{C}H_2 - \underset{R}{C}H_2 - CH = CH - \underset{S}{C}H_3$$

A. P

B. Q

C. R

D. S

Answer:

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10. Which of the following reaction can be employed for getting unsymmetrical alkanes in good yield?

A. Wurtz reaction

B. Corey-House reaction

C. Both

D. None

Answer:

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11. The number of isomers for the compound with molecular formula $C_2BrClFI$

A. 3

B. 4

C. 5

D. 6

Answer:

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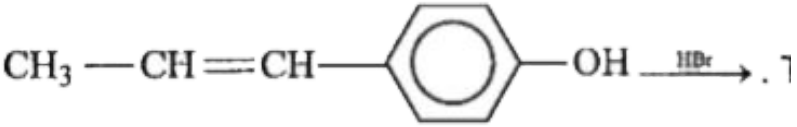
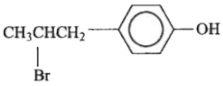
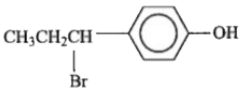
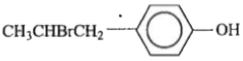
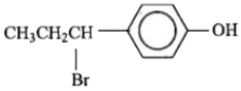


12. . The product is

A. 

B. 

C. 

D. 

Answer:

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13. Among the following the most reactive towards alcoholic KOH is

A. $CH_2 = CHBr$

B. $CH_3COCH_2CH_2Br$

C. CH_3CH_2Br

D. $CH_3CH_2CH_2Br$

Answer:

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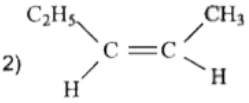
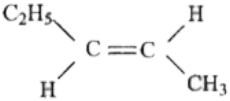
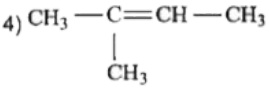
14. Which is the correct increasing order of the stability of isomers of pentene?

1) $CH_3-CH_2-CH_2-CH=CH_2$

2) 

3) 

4) 

A. $1 < 2 < 3 < 4$

B. $1 < 3 < 2 < 4$

C. $4 > 3 > 2 > 1$

D. $4 < 2 < 3 < 1$

Answer:

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15. Identify the incorrect statement/statements:

i) Alkynes are more reactive than alkenes towards electrophilic addition reaction

ii) Alkynes are less reactive than alkenes towards electrophilic addition reaction

iii) Alkynes decolourise Br_2 water

iv) Addition of HBr to alkynes in presence of peroxide proceeds via Markownikoff's rule : i and ii, ii and iii, I and iv, ii and iv

A. i and ii

B. ii and iii

C. I and iv

D. ii and iv

Answer:

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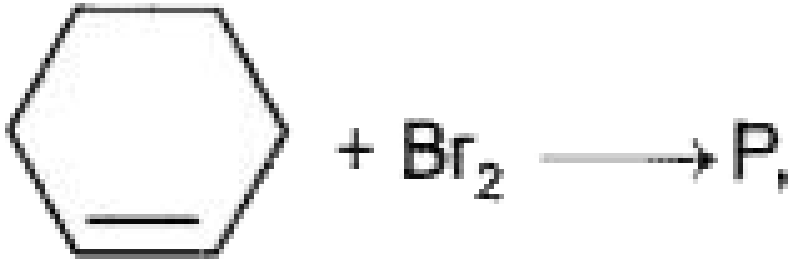
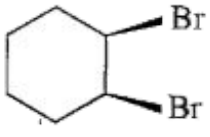
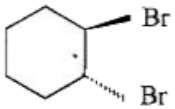


16. , P will have configuration:

A. 

B. 

C. both true

D. None is true

Answer:

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17. The reagents required to convert acetylene into ethylene is

A. Na, $NH_3(I)$

B. H_2, Pd, $BaSO_4$ quinoline

C. H_2 / Ni

D. Na, C_2H_5OH

Answer:

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18. The reagents required to convert ethyl benzene into $C_6H_5C \equiv CH$ are

A. CI_2, $AICI_3$, $NaNH_2$

B. CI_2 light, Ac KOH, CI_2, $NaNH_2$

C. CI_2, light, Aq. KOH, $NaNH_2$

D. CI_2, $AICI_3$, Alc KOH, CI_2NaNH$_2$

Answer:

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19. The reagents required to convert $C_6H_5 - C \equiv CH$ into $C_6H_5CH_2CH_2OH$ are

A. Na/$liQNH_3$, H_2O, H_2SO

B. Na, $liQNH_3B_2H_6$, H_2O_2, $\overline{OH}$

C. H_2 lindlar catalyst, B_2H_6, H_2O_2, $\overline{OH}$

D. H_2O, $HgSO_4$, H_2SO_4, $LiAIH_4$

Answer:

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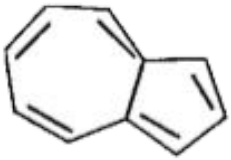
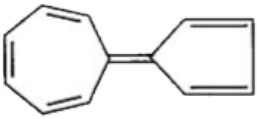
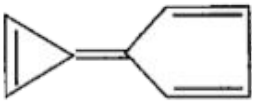
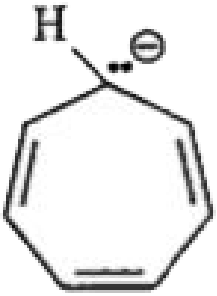
20. Which among the following is aromatic?

A. 

B. 

C. 

D. 

Answer:

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21. The decreasing deactivating ability of the following groups is

$$\underset{P}{-\overset{\oplus}{N}(CH_3)_3} \quad \underset{Q}{-NO_2} \quad \underset{R}{-CF_3} \quad \underset{S}{-NH_3^+}$$

A. P gt S gt Q gt R

B. R gt Q gt S gt P

C. P gt Q gt R gt S

D. Q gt S gt R gt P

Answer:

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22. The reaction leading to formation of m-chloro toluene are

A. $\text{Toluene} \xrightarrow[2)\ \text{sunlight}]{1)Cl_2\text{excess}} A \xrightarrow[AlCl_3]{Cl_2} B \xrightarrow{Zn,\ HCl}$

B. $\text{Toluene} \xrightarrow[2)\ AlCl_3]{1)\ Cl_2} A \xrightarrow[AlCl_3]{Cl_2}$

C. Toluene under go etard reaction,then react with Cl_2, $AlCl_3$. then undergo clemesion reduction.

D. Chlorobenzene $\rightarrow \xrightarrow[AICI_3]{CH_3CI}$

Answer:

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23. Which one of the following is most stable? : $CH \equiv \overset{\cdot\cdot}{C}^{\Theta}$, $CH_2 = \overset{\cdot\cdot}{C}H^{\Theta}, CH_3 - \overset{\cdot\cdot}{C}H_2^{\Theta}, CH_3 - O^{\Theta}$

A. $CH \equiv \overset{\cdot\cdot}{C}^{\Theta}$

B. $CH_2 = \overset{\cdot\cdot}{C}H^{\Theta}$

C. $CH_3 - \overset{\cdot\cdot}{C}H_2^{\Theta}$

D. $CH_3 - O^{\Theta}$

Answer:

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24. Which of the following compounds undergoes dehydrohalogenation most easily on heating with alc. KOH?

A. $CH_3 - \underset{CH_3}{\underset{|}{C}}H - CH_2 - CH_2 - Br$

B. $CH_3 - \underset{Br}{\underset{|}{C}}H - CH_2 - CH_3$

C. $CH_3 - CH_2 - CH_2 - Br$

D. $(CH_3)_3C - CH_2 - Br$

Answer:

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25.

$$CH_3 - \underset{Br}{\underset{|}{C}}H - CH_2 - CH_3 \xrightarrow[\Delta_1 HBr]{\text{alc.KOH}} CH_3 - CH = \underset{I}{C}H - CH_3 + CH_2 =$$

Which among the following statements is not true regarding the reaction?

A. I and II are position isomers and are formed in unequal amounts. Hence this is a regioselective reaction

B. I and II contains the same number of sp^3 and sp^2 carbon atoms

C. Reaction obeys Zaytzeffs rule

D. Product I is a mixture of two stereoisomers formed in unequal amounts. Hence this is a stereospecific reaction.

Answer:

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Level Ii

1. Identify the incorrect statement : C_7H_{16} has nine structural isomers, An alkane of molecular mass 100 can have form optically active isomers, A hydrocarbon with molecular mass 156 can be an alkane, Methane cannot be prepared by Sabatier- Senderen's reduction

A. C_7H_{16} has nine structural isomers

B. An alkane of molecular mass 100 can have form optically active isomers

C. A hydrocarbon with molecular mass 156 can be an alkane

D. Methane cannot be prepared by Sabatier- Senderen's reduction

Answer:

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2. Which among the following is the best method for the preparation of pure propane?

A. $CH_3 - CH_2 - CH_2 - COOH \xrightarrow[\Delta]{NaOH/CaO}$

B. $(CH_3 - CH_2)_2CuLi + CH_3Br \rightarrow$

C. $CH_3 - CH_2 - I + CH_3 - I \xrightarrow{Na/ether}$

D. $CH_3 - CH_2 - I + CH_3 - I \xrightarrow[Methanol]{Zn}$

Answer:

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3. A mixture of tert - Butyl chloride and Ethyl chloride is treated with sodium in ether medium. The main products are :

$$CH_3-\overset{CH_3}{\underset{|}{C}}=CH_2+CH_2=CH_2,$$

$$CH_3-\underset{CH_3}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}}-\underset{CH_3}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}}-CH_3+CH_2=CH_2,$$

$$CH_3-\overset{CH_3}{\underset{|}{C}}=CH_2+CH_3-CH_2-CH_2-CH_3,$$

$$CH_3-\underset{CH_3}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}}-CH_2-CH_3+CH_3-CH_2-CH_2-CH_3$$

A. $CH_3-\overset{CH_3}{\underset{|}{C}}=CH_2+CH_2=CH_2$

B. $CH_3-\underset{CH_3}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}}-\underset{CH_3}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}}-CH_3+CH_2=CH_2$

C. $CH_3-\overset{CH_3}{\underset{|}{C}}=CH_2+CH_3-CH_2-CH_2-CH_3$

D. $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - CH_2 - CH_3 + CH_3 - CH_2 - CH_2 - CH_3$

Answer:

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4. Identify the wrong statement

A. Butyl magnesium bromide reacts with isobutyl alcohol to form butane

B. Boiling points of the following compounds increase in the order

$CH_3 - CH - CH_3 < CH_3 - CH_2 - CH_2 - CH_3 <$

$CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - CH_3 < CH_3 - \underset{\underset{CH_3}{|}}{C}H - CH_2 - CH_3 < CH_3 - (CH_2)_3C$

C. Main constituents of LPG are isobutane and butane

D. Only three optically active compounds are obtained when pentane in subjected to monochlorination

Answer:

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5. The acid which undergoes fastest decarboxylation with soda lime among the following is

A. CH_3COOH

B. $\underset{\underset{NO_2}{|}}{CH_2}COOH$

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

D. $CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-COOH$

Answer:

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6. Which of the following alkenes does not exhibit geometrical isomerism?

A. 2-methylbut-2-ene

B. But-2-ene

C. 2,3-Dichlorobut-2-ene

D. 1-chloropent-1-ene

Answer:

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7. Identify the false statement

A. When 1 -chlorobutane is heated with alc KOH, the alkene formed is But-1-ene

B. When Butan-1-ol is heated with excess con. H_2SO_4, the major product formed is But-1-ene

C. When neopentyl alcohol is heated with excess con. H_2SO_4 the major product is 2- methylbut-2-ene

D. When 2- chlorobutane is heated with alc KOH, the major product is trans-But-2-ene

Answer:

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8. In which of the following reactions the major product given is not correct?

A. $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - CH_2 - OH \xrightarrow[\Delta]{\text{Con.}H_2SO_4} CH_3 - \overset{\overset{CH_3}{|}}{C} = CH - CH_3$

B. $CH_3 - \underset{\underset{CH_3}{|}}{C} - CH = CH_2 + HBr \rightarrow CH_3 - \overset{\overset{Br}{|}}{\underset{\underset{CH_3}{|}}{C}} - CH_2 - CH_3$

C. $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - CH = CH_2 \xrightarrow[H_2SO_4]{H_2O} CH_3 - \overset{\overset{OH}{|}}{\underset{\underset{CH_3}{|}}{C}} - \overset{\overset{CH_3}{|}}{C}H - CH_3$

D. $CH_3 - \underset{\underset{Br}{|}}{CH} - \underset{\underset{Br}{|}}{CH} - CH_3 \xrightarrow[-2HBr]{2NaNH_2} CH_2 = CH - CH = CH_2$

Answer:

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9. Identify the wrong statement regarding alkenes : Heat of hydrogenation of alkene is inversely proportional to its stability, Catalytic hydrogenation of alkene is a cis addition reaction, Alkenes can be reduced by hydrogen in presence of a homogeneous catalyst, Wilkinsons catalyst, Catalytic hydrogenation is an endothermic process

A. Heat of hydrogenation of alkene is inversely proportional to its stability

B. Catalytic hydrogenation of alkene is a cis addition reaction

C. Alkenes can be reduced by hydrogen in presence of a homogeneous catalyst, Wilkinsons catalyst

D. Catalytic hydrogenation is an endothermic process

Answer:

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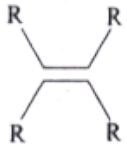
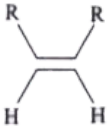
10. Which one of the following alkenes will react fastest with H_2 under catalytic hydrogenation condition?

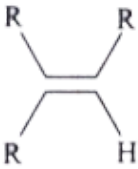
A.



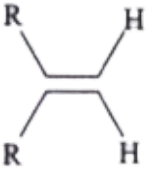
B.



C.



D.



Answer:

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11. To which of the following compounds HBr or Br_2 adds most readily? :

$CH_2 = CH_2$, $CH_3 - CH = CH_2$, $CH_3 - CH = CH - CH_3$,

$CH_3 - \underset{CH_3}{\overset{|}{C}} = CH - CH_3$

A. $CH_2 = CH_2$

B. $CH_3 - CH = CH_2$

C. $CH_3 - CH = CH - CH_3$

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

Answer:

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12. Identify the wrong statement regarding addition of Br_2 / CCl_4 to alkene : Decolourisation of Br_2 / CCl_4 without liberation of HBr is a sure

test for unsaturation, It is an electrophilic addition, It is an anti addition reaction, None of the steps in the reaction mechanism involves attack by a nucleophile.

A. Decolourisation of Br_2/CCI_4 without liberation of HBr is a sure test for unsaturation

B. It is an electrophilic addition

C. It is an anti addition reaction

D. None of the steps in the reaction mechanism involves attack by a nucleophile.

Answer:

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13. In which of the following reaction the major product given is correct?

A.

$$CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{C} = CH_2 + HBr \rightarrow CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{CH} - CH_2 -$$

B. $CH_3 - CH = CH_2 + HBr \xrightarrow[\text{Peroxide}]{\text{Organic}} CH_3 - \underset{\underset{Br}{|}}{CH} - CH_3$

C. $CH_3 - CH = CH_2 + HI \xrightarrow[\text{Peroxide}]{\text{Organic}} CH_3 - CH_2 - CH_2 - I$

D. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH = CH_2 + HBr \rightarrow CH_3 - \overset{\overset{Br}{|}}{\underset{\underset{CH_3}{|}}{C}} - CH_2 - CH_3$

Answer:

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14. An alkene on reductive ozonolysis gives $CH_2(CHO)_2$. The alkene is

A. Hexa - 2, 4 - diene

B. Cyclohexa - 1, 3 - diene

C. Cyclohexa - 1, 4 - diene

D. Hexa - 1, 4 - diene

Answer:

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15. Ozonolysis of an organic compound gives formaldehyde as one of the products. This confirm the presence of

A. two ethylenic double bonds

B. a vinyl group

C. an isopropyl group

D. an acetylenic triple bond

Answer:

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16. Oxidation of an alkene X gives a diol and further oxidation gives a diketone. Which of the following is X

A. $(CH_3)_2C = C(CH_3)_2$

B. $CH_3 = CH = C(CH_3)_2$

C. $(CH_3)_2CH - CH = CH_2$

D. $C_6H_5 - CH = CH - C_6H_5$

Answer:

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17. Identify the wrong statements

A. $CH_3 - \overset{\overset{C_2H_5}{|}}{\underset{\underset{CH=CH_2}{|}}{C}} - COOH$ on decarboxylation with soda lime gives a racemic mixture

B. $CH_3 - \overset{\overset{C_2H_5}{|}}{\underset{\underset{CH=CH_2}{|}}{C}} - H$ gives a mixture of two diastereomers on treatment with HBr

C. $CH_3 - CH_2 - CH = CH_2 \xrightarrow[hv]{NBS} A \xrightarrow[\Delta]{\text{Alc.KOH}} B$. B is Buta-1, 3-diene

D. Ethylene bromide can be converted to ethene by Na/ether, Zn/methanol or Mg/ether

Answer:

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18.

A and B respectively are

A. 

B. 

C. 

D. 

Answer:

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19. tert-butyl chloride can be converted to isobutene by

A. Alc KOH

B. Na/ether

C. $LiAIH_4$

D. All

Answer:

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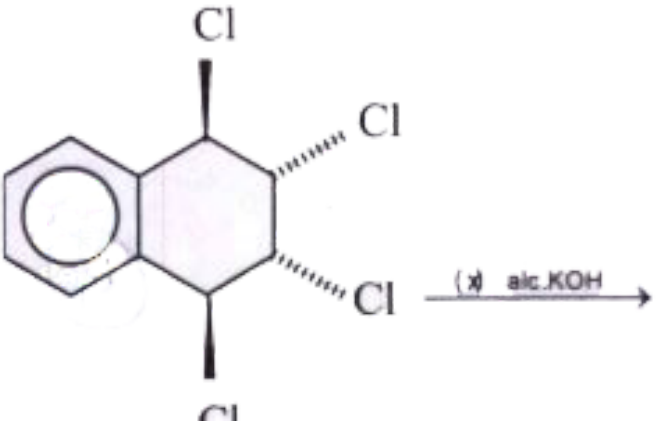
20. For the following reaction



the moles of (x) of alc.KOH consumed

A. 0

B. 1

C. 2

D. 3

Answer:

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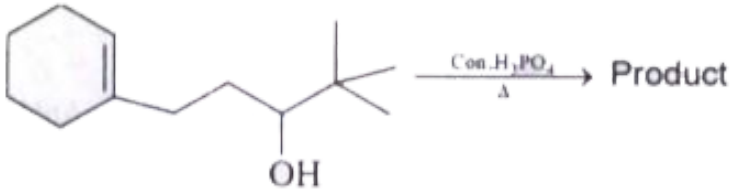
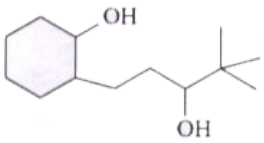
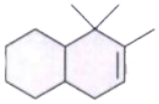
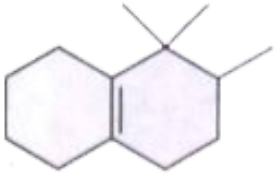


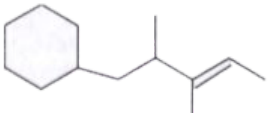
21.

Which of the following will be the product

A. 

B. 

C. 

D. 

Answer:

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22. Which among the following is not a nucleophilic addition reaction?

A. $CH_3 - C \equiv CH + H_2O \xrightarrow[65^\circ C]{H^+ . Hg^{2+}} CH_3 - CO - CH_3$

B. $CH \equiv CH + CH_3 . COOH \xrightarrow[65^\circ C]{Hg^{2+}} CH_3 - COO - CH = CH_2$

C. $CH \equiv CH + HCN \xrightarrow{Ba(CN)_2} CH_2 = CH - CN$

D. $CH \equiv CH + 2CI_2 \rightarrow CI_2CH - CHCI_2$

Answer:

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23. $CH_3 - C \equiv C - CH_2 - CH_3 \xrightarrow[2) H_2O_2 / OH]{1) BH_3} X$. The main product X is

: 3 - Methylbutanone, Pentanal, 3- Methytbutanal, Pentan - 2 - one

A. 3 - Methylbutanone

B. Pentanal

C. 3- Methytbutanal

D. Pentan - 2 - one

Answer:

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24. Butanone is obtained as main product from which of the following reactions?

1. $CH_3 - C \equiv C - CH_3 \xrightarrow[2)H_2O_2/OH^-]{1)BH_3}$

2. $CH_3 - C \equiv C - CH_3 \xrightarrow[Hg^{2+},65^\circ C]{dilH_2SO_4}$

3. $CH_3 - CH_1 - C \equiv CH \xrightarrow[Hg^{2+},65^\circ C]{dilH_2SO_4}$

4. $CH_3 - CH_2 - C \equiv CH \xrightarrow[2)H_2O_2/OH^-]{1)BH_3}$ 1, 2, 3, 4 ; 2, 3, 4 ; 1, 3, 4 ; 1, 2, 3

A. 1, 2, 3, 4

B. 2, 3, 4

C. 1, 3, 4

D. 1, 2, 3

Answer:

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25. Identify the wrong statement : On warming with Ag powder chloroform is converted to ethyne, But-1-yne and But-2-yne can be distinguished by treatment with ammoniacal Cu_2CI_2 or $AgNO_3$, Lewisite is prepared from ethyne, Neoprene is a polymer of isoprene

A. On warming with Ag powder chloroform is converted to ethyne

B. But-1-yne and But-2-yne can be distinguished by treatment with ammoniacal Cu_2CI_2 or $AgNO_3$

C. Lewisite is prepared from ethyne

D. Neoprene is a polymer of isoprene

Answer:

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26. Identify the wrong statement : The reagent which converts But-1-yne to But-2-yne is ale. KOH, The reagent which converts But-2-yne to But-1-yne is $NaNH_2$, Catalyst used in the dimerisation of acetylene in the preparation of chloroprene in aq. NH_4CI containing $CuCI_2$, When 2, 3-Dibromobutane is treated with ale.KOH the product formed is Buta-1, 3-diene

A. The reagent which converts But-1-yne to But-2-yne is ale. KOH

B. The reagent which converts But-2-yne to But-1-yne is $NaNH_2$

C. Catalyst used in the dimerisation of acetylene in the preparation of chloroprene in aq. NH_4CI containing $CuCI_2$

D. When 2, 3-Dibromobutane is treated with ale.KOH the product formed is Buta-1, 3-diene

Answer:

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27. Identify the false statement

A. $C-C, C=C$ and $C \equiv C$ bond energies are about 350, 680 and 835 KJ mol $^{-1}$ respectively

B. Carbon-Carbon bond length in the following molecules is in the order $C_2H_6 > C_6H_6 > C_2H_4 > C_2H_2$

C. There are six sp^2 hybrid orbitals in allene

D. $C-H$ bond energy is in the order $^{30}C-H > ^{20}C-H > ^{10}C-H$

Answer:

Watch Video Solution

28. Benzene can be directly obtained from

A. Acetylene

B. Phenol

C. Chlorobenzene

D. All the above

Answer:

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29. In the reaction $C_6H_5 - N_2^{\oplus}Cl^{\odot} \xrightarrow[NaOH]{Na_2SnO_2} X,$ X is

A. $C_6H_5 - OH$

B. $C_6H_5 - Sn - C_6H_5$

C. C_6H_6

D. $C_6H_5 - Cl$

Answer:

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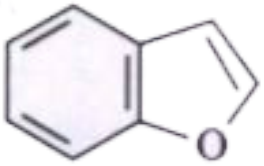
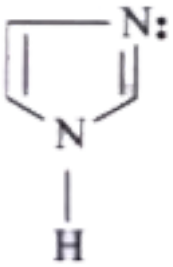
30. Which among the following is aromatic?

A. 

B. 

C. 

D. All

Answer:

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31. Among the following statements on the nitration of aromatic compounds, the false one is

A. The rate of nitration of benzene is almost the same as that of hexadeutrobenzene

B. The rate of nitraiton of toluene is greater than that of benzene

C. The rate of nitration of benzene is greater than that of hexadeutrobenzene

D. Nitration is an electrophilic substitution reaction

Answer:

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32. Identify the wrong statement : Benzene is reduced by $Na/liqNH_3$ in the presence of ethanol to cyclohexa - 1, 3 - diene, When heated with oxygen in presence of V_2O_5 benzene is oxidised to maleic anhydride,

Toluene on ozonolysis gives a mixture of glyoxal and methyl glyoxal, Ethyl benzene on oxidation with hot $KMnO_4/OH^-$ followed by acidification gives benzoic acid

A. Benzene is reduced by $Na/liqNH_3$ in the presence of ethanol to cyclohexa - 1, 3 - diene

B. When heated with oxygen in presence of V_2O_5 benzene is oxidised to maleic anhydride

C. Toluene on ozonolysis gives a mixture of glyoxal and methyl glyoxal

D. Ethyl benzene on oxidation with hot $KMnO_4/OH^-$ followed by acidification gives benzoic acid

Answer:

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33. Identify the wrong statement

A. Reactivity of the following compounds towards electrophilic substitution Is Toluene gt Benzene gt Chlorobenzene gt Nitrobenzene

B. When benzene is treated with $CHCI_3$ in in presence of $AICI_3$ the product formed in $(C_6H_5)_3CH$.

C. C_6D_6 can be prepared by treating C_6H_6 with con. D_2SO_4

D. $-NHCOCH_3$ group is o, p-directing while - $\mathrm{CCl_3}$ and $-NO$ group are metadirecting towards electrophilic substitution

Answer:

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34. The compound X produces methane when treated with water. The compound X is

A. Calcium carbide

B. Aluminium carbide

C. Calcium phosphide

D. Aluminium nitride

Answer:

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35. Cis-But-2-ene is treated with Br_2 / CCl_4. The product is

A. Meso form of 2, 3-Dibromobutane

B. Racemic form of 2, 3-Dibromobutane

C. 1, 4-Dibromobutane

D. Racemic-2-Bromobutane

Answer:

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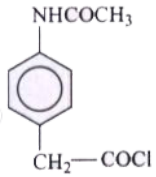
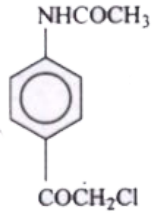
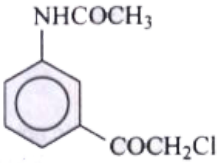
36. Predict the products of the following reactions



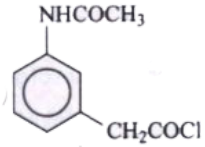
A.



B.



C.

D. 

Answer:

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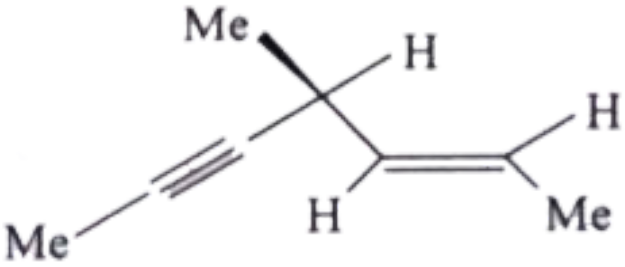
37. 

Hydrogenation of the compound in the presence of poisoned Pd catalyst gives

A. An optically active compound

B. An optically inactive compound

C. A racemic mixture

D. A diastereomeric mixture

Answer:

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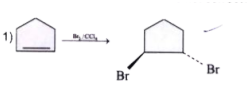
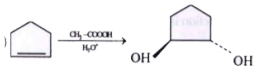
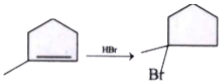
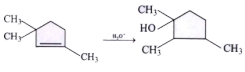
38. 'Which of the following statement is not correct?

A. 

B. 

C. 

D. 

Answer:

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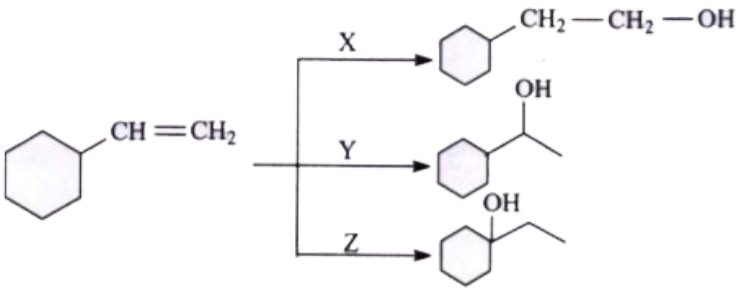

39.

X, Y, Z reaction are

A. Simple hydration reaction

B. Hydroboration oxidation, hydration and oxymercuration demercuration

C. Hydroboration oxidation, oxymercuration demercuration and hydration

D. Oxymercuration demercuration, hydroboration oxidation and hydration

Answer:

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40. $CCl_3CH = CH_2 \xrightarrow{Cl_2 + H_2O}$ P, major product 'P' is

A. $CCl_3\underset{\underset{OH}{|}}{CH}CH_2Cl$

B. $CCl_3\underset{\underset{Cl}{|}}{C}HCH_2OH$

C. $CCl_3\underset{\underset{Cl}{|}}{C}H\underset{\underset{Cl}{|}}{C}H_2$

D. $CCl_3\underset{\underset{OH}{|}}{C}H\underset{\underset{OH}{|}}{C}H_2$

Answer:

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41. How many isomers exist with the formula C_4H_6 ? 2, 3, 4, 9

A. 2

B. 3

C. 4

D. 9

Answer:

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42. Which is wrong about conformation ?

A. A change in conformation of a molecule may result in a change in its configuration

B. Cyclohexane is the most stable cycloalkane and chair form in its most stable conformation

C. Dihedral angle in eclipsed conformation of ethane is zero

D. Energy difference between eclipsed and staggered conformations of ethane is $12.5\mathrm{KJ\ mol}^{-1}$

Answer:

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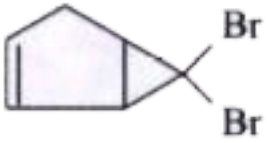
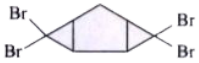
43. 

The major product of reaction is

A. 

B. 

C. 

D. 

Answer:

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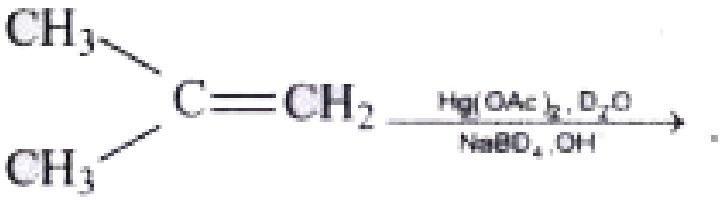
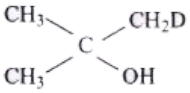
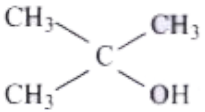
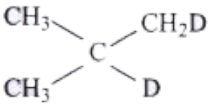


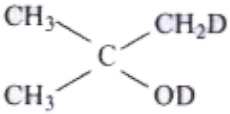
44.

Major product. The major product of reaction is

A. 

B. 

C. 

D. 

Answer:

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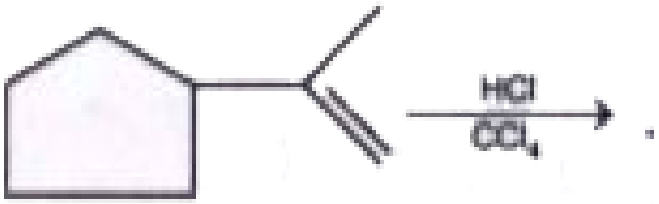
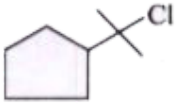
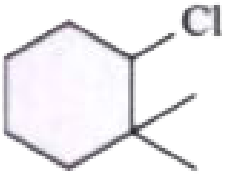
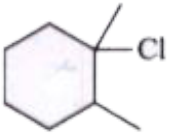


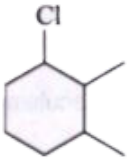
45.

Major product. The major product of reaction is

A.


B.


C.


D.


Answer:

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46. Assertion: Friedel-Crafts alkylation and acylation of benzaldehyde do not take place .

Reason : Under the above reaction conditions aldehyde group gives addition reaction. : If both assertion and reason are correct and reason is the correct explanation of assertion., Both assertion and reason are correct but reason is not the correct explanation of assertion, If assertion is correct and reason is not correct, Assertion is wrong and reason is correct

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

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

C. If assertion is correct and reason is not correct

D. Assertion is wrong and reason is correct

Answer:

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47. Assertion : Addition of HBr in the presence of peroxide on 1-methylcyclopentene gives four optical isomers as major product.

Reason : The major product contains two different chiral carbon atom

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

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

C. If assertion is correct and reason is not correct

D. Assertion is wrong and reason is correct

Answer:

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48. Assertion : Addition of HBr to s-form of 3-bromopent-1-ene gives two optical isomers as products

Reason : The products contains two different chiral carbon atoms, one of them being formed during electrophilic addition of HBr

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

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

C. If assertion is correct and reason is not correct

D. Assertion is wrong and reason is correct

Answer:

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Level I

1. The compound which contains all the four $1^\circ, 2^\circ, 3^\circ, 4^\circ$ carbon atoms is

A. 2,3-Dimethylpentane

B. 2,2,4-trimethylpentane

C. 2,3,4-Trimethylpentane

D. 3,3-Dimethylpentane

Answer: B

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2. Indicate the expected structure of the organic product when ethyl magnesium bromide is treated with heavy water (D_2O).

A. $C_2H_5 - C_2H_5$

B. C_2H_5OD

C. C_2H_6

D. C_2H_5D

Answer: D

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3. On mixing a certain alkane with chlorine, and irradiating it with ultraviolet light, it forms only one monochloroalkane. This alkane could be

A. Neopentane

B. Propane

C. Pentane

D. Isopentane

Answer: A

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4. Which of the following product is obtained at cathode during Kolbe's electrolysis of $RCOO^{-}Na^{+}$ (aq.)?

A. Alkane

B. Sodium

C. Hydrogen

D. Sodium hydroxide

Answer: C

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5. Ozonolysis of 2, 3-dimethyl-1-butene followed by reduction with zinc and water gives.

A. Methanoic acid and 3-methyl-2-butanone

B. Methanal and 3-methyl-2-butanone

C. Methanal and 2-methyl-3-butanone

D. None of these

Answer: B

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6. Position of double bond in alkenes is identified by

A. Bromine water

B. Ammoniacal silver nitrate solution

C. Ozonolysis

D. Baeyer's reagent

Answer: C

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7. Which of the following can be used for the preparation of propane?

$CH_3CH = CH_2 \xrightarrow[(ii)\,H_2O_2/NaOH]{(i)\,B_2H_6}$, $CH_3CH_2CH_2Cl \xrightarrow[(ii)\,H_2O]{(i)\,\text{Mg/ether}}$,

$CH_3CH_2CH_2I \xrightarrow[150^\circ C]{\text{HI./Heat}}$, $CH_3CH_2CH_2COONa \xrightarrow[\text{Heat}]{NaOH\,(CaO)}$

A. $CH_3CH = CH_2 \xrightarrow[(ii)\,H_2O_2/NaOH]{(i)\,B_2H_6}$

B. $CH_3CH_2CH_2Cl \xrightarrow[(ii)\,H_2O]{(i)\,\text{Mg/ether}}$

C. $CH_3CH_2CH_2I \xrightarrow[150^\circ C]{\text{HI./Heat}}$

D. $CH_3CH_2CH_2COONa \xrightarrow[\text{Heat}]{NaOH\,(CaO)}$

Answer: D

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8. The product obtained on heating n-heptane with $Cr_2O_3.Al_2O_3$ at $600^\circ C$ is

A. cyclohexane

B. cyclohexene

C. benzene

D. toluene

Answer: D

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9. Wurtz reaction converts alkyl halide into alkane when it is made to react with

A. Na in alcohol

B. Na in dry ether

C. Zn in alcohol

D. Zn in dry ether

Answer: B

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10. Which one of the following is expected to have minimum boiling point?

A. n-Butane

B. n-Pentane

C. 2-Methylbutane

D. 2,2-Dimethylpropane

Answer: D

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11. The relative stability of the three isomers of pentane, namely, n-pentane, isopentane and neopentane follows the order

A. n-pentane $>$ isopentane $>$ neopentane

B. n-pentane $>$ neopentane $>$ isopentane

C. neopentane $>$ isopentane $>$ n-pentane

D. neopentane $>$ n-pentane $>$ isopentane

Answer: C

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12. A single substitution of H atom in an alkane of molar mass $72\ \mathrm{g\ mol^{-1}}$ by chlorine produces only one product. The alkane is

A. n-pentane

B. 2-methylbutane

C. 2,2-dimethylpropane

D. n-butane

Answer: C

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13. Chlorination of n-butane produces

A. 1-chlorobutane as the chief product

B. 2-chlorobutane as the chief product

C. 1-chlorobutane more than 2-chlorobutane

D. 2-chlorobutane more than 1-chlorobutane

Answer: D

Watch Video Solution

14. Which of the following molecules has the minimum bond energy of the indicated C-H bond?

A. $CH_3 - H$

B. $CH_3CH_2 - H$

C. $(CH_3)_2CH - H$

D. $(CH_3)_3C - H$

Answer: D

Watch Video Solution

15. Which of the following conformations of cyclohexane is most stable?

A. Chair

B. Boat

C. Twist-boat

D. Half-chair

Answer: A

Watch Video Solution

16. n-Propyl bromide on treatment with ethanolic potassium hydroxide produces

A. propane

B. propene

C. propyne

D. propanol

Answer: B

Watch Video Solution

17. The dehydration of 2 methylbutanol with concentrated H_2SO_4 produces .

A. 2-methylbutene as the major product

B. 2-methylbut-2-ene as the major product

C. 1-pentene

D. pent-2-ene

Answer: B

Watch Video Solution

18. The addition of HCl in the presence of peroxide does not follow anti-Markovnikov's rule because

A. HCl bond is too strong to be broken homolytically

B. Cl atom is not reactive enough to add on to a double bond

C. Cl combines with H to give back HCl

D. HCl is a reducing agent

Answer: A

Watch Video Solution

19. When ethene reacts with bromine in aqueous sodium chloride solution, the product(s) obtained is (are)

A. ethylene dibromide only

B. ethylene dibromide and 1-bromo-2-chloroethane

C. 1-bromo-2-chloroethane only

D. ethylene dichloride only

Answer: B

Watch Video Solution

20. The treatment of $CH_3\underset{\underset{CH_3}{|}}{C}=CH_2$ with $NaIO_4$ or boiling $KMnO_4$ produces

A. $CH_3COCH_3 + CH_2O$

B. $CH_3CHO + CH_3CHO$

C. $CH_3COCH_3 + CO_2$

D. $CH_3COCH_3 + HCOOH$

Answer: C

View Text Solution

21. An alkene on oxidative ozonolysis gives adipic acid. The alkene is:

A. cyclohexene

B. 1-methylcyclopentene

C. 1,2-dimethylcyclobutene

D. 3-hexene

Answer: A

Watch Video Solution

22. Which of the following hydrocarbons has the lowest dipole moment?

A. 

B. $CH_3C = CCH_3$

C. $CH_3CH_2C \equiv CH$

D. $CH_2 = CH - C \equiv CH$

Answer: B

Watch Video Solution

23. Identify a reagent from the following list which can easily distinguish between 1-butyne and 2-butyne.

A. bromine, CCl_4

B. H_2 , Lindlar catalyst

C. dilute H_2SO_4, $HgSO_4$

D. ammoniacal Cu_2Cl_2 solution

Answer: D

Watch Video Solution

24. The addition of water to propyne in the presence of $HgSO_4 - H_2SO_4$ produces

A. $CH_3CH = CHOH$

B. CH_3COCH_3

C. $CH_3CH_2CH_2OH$

D. CH_3CHO

Answer: B

Watch Video Solution

25. The reduction of an alkyne to alkene using Lindlar catalyst results into

A. cis addition of hydrogen atoms

B. trans addition of hydrogen atorns

C. a mixture obtained by cis and trans additions of hydrogen in equimolar amounts.

D. a mixture obtained by cis and trans additions of hydrogen atoms in unequal amounts

Answer: A

View Text Solution

26. The treatment of $CH_3CH_2C \equiv CCH_2CH_2CH_3$ with $KMnO_4$ under neutral conditions at room temperature gives

A. $CH_3CH_2\underset{\underset{OH}{|}}{C}H - \underset{\underset{OH}{|}}{C}H - CH_2CH_2CH_3$

B. $CH_3CH_2\underset{\underset{OH}{|}}{C}H - \underset{\underset{O}{||}}{C} - CH_2CH_2CH_3$

C. $CH_3CH_2 - \underset{\underset{O}{||}}{C} - - \underset{\underset{O}{||}}{C} - CH_2CH_2CH_3$

D. $CH_3CH_2COOH + CH_3CH_2CH_2COOH$

Answer: C

View Text Solution

27. Which statement is correct?

A. Low chemical reactivity of alkanes is due to strong C-Cand C-H bonds.

B. Alkanes show characteristic substitution reactions because they are saturated

C. Reaction of alkanes with fluorine is explosive even in dark

D. All of the above

Answer: D

Watch Video Solution

28. Which of the following species is aromatic?

A. cyclopropenyl cation

B. cyclobutadiene

C. cyclopentadiene

D. cyclopropane

Answer: A

Watch Video Solution

29. The reaction of toluene with chlorine in presence of ferric chloride gives predominantly

A. benzoyl chloride

B. m-chlorotoluene

C. benzyl chloride

D. o-and p-chlorotoluene

Answer: D

Watch Video Solution

30. The correct sequence of activating power of a group in benzene is

A. $-NH_2 > -NHCOCH_3 > -CH_3$

B. $-NH_2 < -NHCOCH_3 < -CH_3$

C. $-NH_2 > -NHCOCH_3 < -CH_3$

D. $-NH_2 < -NHCOCH_3 > -CH_3$

Answer: A

Watch Video Solution

31. When alcoholic solution of ethylene dibromide is heated with granulated zinc, the compound formed is:

A. ethane

B. ethylene

C. butane

D. isobutane

Answer: B

Watch Video Solution

32. Which of the following yields both alkane and alkene?

A. Williamson's synthesis

B. Kolbe's electrolytic method

C. Wittig reaction

D. Sandmeyer's reaction

Answer: B

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33. Out of the five isomeric hexanes, the isomer that can give two monochlorinated compounds is

A. 2,3-Dimethyl butane

B. 2,2-Dimethyl butane

C. 2,2-Dimethyl pentane

D. n-Hexane

Answer: A

Watch Video Solution

34. The structure of alkane with molecular formula C_8H_{18} that has only $1^\circ H$ atoms is:

A. 2,2,3,3-Tetramethylbutane

B. 2,2,3-Trimethylpentane

C. 2,2,4-Trimethylpentane

D. 2,3,3-Trimethylpentane

Answer: A

Watch Video Solution

35. Which of the following will have lower pK_a value?

A. H

B. H_b

C. H_c

D. H_d

Answer: A

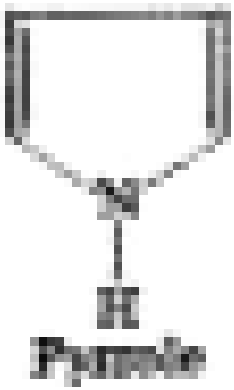
View Text Solution

36. Which of the following is non-aromatic in nature?

A.

B.

C.



D.

Answer: B

Watch Video Solution

37. Which statement is correct about cyclopentadienyl anion (I) and benzene (II)?

A. Both (I) and (II) are aromatic but (II) is more stable than (I)

B. Both (I) and (II) are aromatic and have the same stability

C. (II) is more aromatic and more stable than (I) and it is non-aromatic

D. (I) is more stable than (II) though both are aromatic.

Answer: A

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38. 

Which reagent cannot be used for the above conversion?

A. 

B. Et_3N

C. $POCl_3$

D. NH_3

Answer: C

View Text Solution

39. The compound 1, 2-butadiene has:

A. only sp-hybridised carbon atoms

B. only sp^2-hybridised carbon atoms

C. both sp-and sp^2-hybridised carbon atoms

D. sp-, sp^2- and sp^3- hybridised carbon atoms

Answer: D

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40. Which one of the following alkenes will react fastest with H_2 under catalytic hydrogenation condition?

A. 

B. 

C. 

D. 

Answer: A

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41. 2-Hexyne gives trans-2-hexene on treatment with:

A. Li / NH_3

B. $Pd / BaSO_4$

C. $LiAlH_4$

D. Pt / H_2

Answer: A

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42. Oxidation of naphthalene by acidic $KMnO_4$ gives:

A. toluene

B. benzaldehyde

C. phthalic acid

D. benzoic acid

Answer: C

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43. Which of the following has maximum resonance energy?

A. Anthracene

B. Benzene

C. Naphthalene

D. Phenanthrene

Answer: D

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44. The synthesis of 3-octyne is achieved by adding a bromoalkane into a mixture of sodium amide and alkyne. The bromoalkane and alkyne, respectively, are

A. $BrCH_2CH_2CH_2CH_2CH_3$ and $CH_3CH_2C \equiv CH$

B. $BrCH_2CH_2CH_3$ and $CH_3CH_2CH_2C \equiv CH$

C. $BrCH_2CH_2CH_2CH_2CH_3$ and $CH_3C \equiv CH$

D. $BrCH_2CH_2CH_2CH_3$ and $CH_3CH_2C \equiv CH$

Answer: B

Watch Video Solution

45. On passing benzene vapour through a red hot tube at $700 - 800^\circ C$ or through molten lead we get:

A. diphenyl

B. phenol

C. toluene

D. benzaldehyde

Answer: A

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46. The compound which contains all the four $1^\circ, 2^\circ, 3^\circ, 4^\circ$ carbon atoms is

A. 2,3-Dimethylpentane

B. 2,2,4-trimethylpentane

C. 2,3,4-Trimethylpentane

D. 3,3-Dimethylpentane

Answer: B

Watch Video Solution

47. Indicate the expected structure of the organic product when ethyl magnesium bromide is treated with heavy water (D_2O).

A. $C_2H_5 - C_2H_5$

B. C_2H_5OD

C. C_2H_6

D. C_2H_5D

Answer: D

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48. On mixing a certain alkane with chlorine, and irradiating it with ultraviolet light, it forms only one monochloroalkane. This alkane could be

A. Neopentane

B. Propane

C. Pentane

D. Isopentane

Answer: A

Watch Video Solution

49. Which of the following product is obtained at cathode during Kolbe's electrolysis of $RCOO^{-}Na^{+}$ (aq.)?

A. Alkane

B. Sodium

C. Hydrogen

D. Sodium hydroxide

Answer: C

Watch Video Solution

50. Ozonolysis of 2, 3-dimethyl-1-butene followed by reduction with zinc and water gives.

A. Methanoic acid and 3-methyl-2-butanone

B. Methanal and 3-methyl-2-butanone

C. Methanal and 2-methyl-3-butanone

D. None of these

Answer: B

Watch Video Solution

51. Position of double bond in alkenes is identified by

A. Bromine water

B. Ammoniacal silver nitrate solution

C. Ozonolysis

D. Baeyer's reagent

Answer: C

Watch Video Solution

52. Which of the following can be used for the preparation of propane?

$CH_3CH=CH_2 \xrightarrow[(ii)\,H_2O_2/NaOH]{(i)\,B_2H_6}$, $CH_3CH_2CH_2Cl \xrightarrow[(ii)\,H_2O]{(i)\,\text{Mg/ether}}$,

$CH_3CH_2CH_2I \xrightarrow[150^\circ C]{\text{HI./Heat}}$, $CH_3CH_2CH_2COONa \xrightarrow[\text{Heat}]{NaOH\,(CaO)}$

A. $CH_3CH=CH_2 \xrightarrow[(ii)\,H_2O_2/NaOH]{(i)\,B_2H_6}$

B. $CH_3CH_2CH_2Cl \xrightarrow[(ii)\,H_2O]{(i)\,Mg/\text{ether}}$

C. $CH_3CH_2CH_2I \xrightarrow[150^\circ C]{HI/\text{Heat}}$

D. $CH_3CH_2CH_2COONa \xrightarrow[\text{Heat}]{NaOH\,(CaO)}$

Answer: D

Watch Video Solution

53. The product obtained on heating n-heptane with Cr_2O_3. Al_2O_3 at $600^\circ C$ is

A. cyclohexane

B. cyclohexene

C. benzene

D. toluene

Answer: D

Watch Video Solution

54. Wurtz reaction converts alkyl halide into alkane when it is made to react with

A. Na in alcohol

B. Na in dry ether

C. Zn in alcohol

D. Zn in dry ether

Answer: B

Watch Video Solution

55. Which one of the following is expected to have minimum boiling point?

A. n-Butane

B. n-Pentane

C. 2-Methylbutane

D. 2,2-Dimethylpropane

Answer: D

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56. The relative stability of the three isomers of pentane, namely, n-pentane, isopentane and neopentane follows the order

A. n-pentane $>$ isopentane $>$ neopentane

B. n-pentane $>$ neopentane $>$ isopentane

C. neopentane $>$ isopentane $>$ n-pentane

D. neopentane $>$ n-pentane $>$ isopentane

Answer: C

Watch Video Solution

57. A single substitution of H atom in an alkane of molar mass $72\ \mathrm{g\ mol^{-1}}$ by chlorine produces only one product. The alkane is

A. n-pentane

B. 2-methylbutane

C. 2,2-dimethylpropane

D. n-butane

Answer: C

Watch Video Solution

58. Chlorination of n-butane produces

A. 1-chlorobutane as the chief product

B. 2-chlorobutane as the chief product

C. 1-chlorobutane more than 2-chlorobutane

D. 2-chlorobutane more than 1-chlorobutane

Answer: D

Watch Video Solution

59. Which of the following molecules has the minimum bond energy of the indicated C-H bond?

A. $CH_3 - H$

B. $CH_3CH_2 - H$

C. $(CH_3)_2CH - H$

D. $(CH_3)_3C - H$

Answer: D

Watch Video Solution

60. Which of the following conformations of cyclohexane is most stable?

A. Chair

B. Boat

C. Twist-boat

D. Half-chair

Answer: A

Watch Video Solution

61. n-Propyl bromide on treatment with ethanolic potassium hydroxide produces

A. propane

B. propene

C. propyne

D. propanol

Answer: B

Watch Video Solution

62. The dehydration of 2 methylbutanol with concentrated H_2SO_4 produces .

A. 2-methylbutene as the major product

B. 2-methylbut-2-ene as the major product

C. 1-pentene

D. pent-2-ene

Answer: B

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63. The addition of HCl in the presence of peroxide does not follow anti-Markovnikov's rule because

A. HCl bond is too strong to be broken homolytically

B. Cl atom is not reactive enough to add on to a double bond

C. Cl combines with H to give back HCI

D. HCl is a reducing agent

Answer: A

Watch Video Solution

64. When ethene reacts with bromine in aqueous sodium chloride solution, the product(s) obtained is (are)

A. ethylene dibromide only

B. ethylene dibromide and 1-bromo-2-chloroethane

C. 1-bromo-2-chloroethane only

D. ethylene dichloride only

Answer: B

Watch Video Solution

65. The treatment of $CH_3\underset{\underset{CH_3}{|}}{C}=CH_2$ with $NaIO_4$ or boiling $KMnO_4$ produces

A. $CH_3COCH_3 + CH_2O$

B. $CH_3CHO + CH_3CHO$

C. $CH_3COCH_3 + CO_2$

D. $CH_3COCH_3 + HCOOH$

Answer: C

Watch Video Solution

66. An alkene on oxidative ozonolysis gives adipic acid. The alkene is:

A. cyclohexene

B. 1-methylcyclopentene

C. 1,2-dimethylcyclobutene

D. 3-hexene

Answer: A

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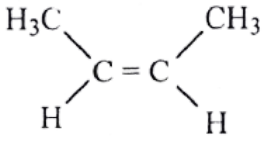
67. Which of the following hydrocarbons has the lowest dipole moment?

A. 

B. $CH_3C \equiv CCH_3$

C. $CH_3CH_2C \equiv CH$

D. $CH_2 = CH - C \equiv CH$

Answer: B

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68. Identify a reagent from the following list which can easily distinguish between 1-butyne and 2-butyne.

A. bromine, CCl_4

B. H_2 Lindlar catalyst

C. dilute H_2SO_4, $HgSO_4$

D. ammoniacal Cu_2Cl_2 solution

Answer: D

Watch Video Solution

69. The addition of water to propyne in the presence of $HgSO_4 - H_2SO_4$ produces

A. $CH_3CH = CHOH$

B. CH_3COCH_3

C. $CH_3CH_2CH_2OH$

D. CH_3CHO

Answer: B

Watch Video Solution

70. The reduction of an alkyne to alkene using Lindlar catalyst results into

A. cis addition of hydrogen atoms

B. trans addition of hydrogen atoms

C. a mixture obtained by cis and trans additions of hydrogen in equimolar amounts.

D. a mixture obtained by cis and trans additions of hydrogen atoms in unequal amounts.

Answer: A

Watch Video Solution

71. The treatment of $CH_3CH_2C \equiv CCH_2CH_2CH_3$ with $KMnO_4$ under neutral conditions at room temperature gives

A. $CH_3CH_2\underset{\underset{OH}{|}}{C}H - \underset{\underset{OH}{|}}{C}HCH_2CH_2CH_3$

B. $CH_3CH_2\underset{\underset{OH}{|}}{C}H-\underset{\underset{O}{||}}{C}-CH_2CH_2CH_3$

C. $CH_3CH_2\underset{\underset{O}{||}}{C}-\underset{\underset{O}{||}}{C}-CH_2CH_2CH_3$

D. $CH_3CH_2COOH+CH_3CH_2CH_2COOH$

Answer: C

Watch Video Solution

72. Which statement is correct?

A. Low chemical reactivity of alkanes is due to strong C-C and C-H bonds.

B. Alkanes show characteristic substitution reactions because they are saturated

C. Reaction of alkanes with fluorine is explosive even in dark

D. All of the above

Answer:

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73. Which of the following species is aromatic?

A. cyclopropenyl cation

B. cyclobutadiene

C. cyclopentadiene

D. cyclopropane

Answer: A

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74. The reaction of toluene with chlorine in presence of ferric chloride gives predominantly

A. benzoyl chloride

B. m-chlorotoluene

C. benzyl chloride

D. o-and p-chlorotoluene

Answer: D

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75. The correct sequence of activating power of a group in benzene is

A. $-NH_2 > -NHCOCH_3 > -CH_3$

B. $-NH_2 < -NHCOCH_3 < -CH_3$

C. $-NH_2 > -NHCOCH_3 < -CH_3$

D. $-NH_2 < -NHCOCH_3 > -CH_3$

Answer: A

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76. When alcoholic solution of ethylene dibromide is heated with granulated zinc, the compound formed is:

A. ethane

B. ethylene

C. butane

D. isobutane

Answer: B

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77. Which of the following yields both alkane and alkene?

A. Williamson's synthesis

B. Kolbe's electrolytic method

C. Wittig reaction

D. Sandmeyer's reaction

Answer: B

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78. Out of the five isomeric hexanes, the isomer that can give two monochlorinated compounds is

A. 2,3-Dimethyl butane

B. 2,2-Dimethyl butane

C. 2,2-Dimethyl pentane

D. n-Hexane

Answer: A

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79. The structure of alkane with molecular formula C_8H_{18} that has only $1^\circ H$ atoms is:

A. 2, 2, 3, 3 -Tetramethylbutane

B. 2, 2, 3-Trimethylpentane

C. 2, 2, 4-Trimethylpentane

D. 2, 3, 3-Trimethylpentane

Answer: A

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80. Which of the following will have lower pK_a value?

A. H_a

B. H_b

C. H_c

D. H_d

Answer: A

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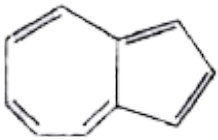
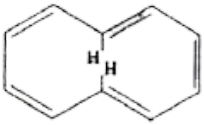
81. Which of the following is non-aromatic in nature?

A.



Azulene

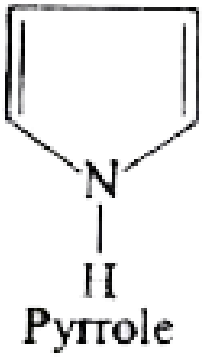
B.



[10]-Annulene

C.

Furan

D. 

Answer: B

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82. Which statement is correct about cyclopentadienyl anion (I) and benzene (II)?

A. Both (I) and (II) are aromatic but (II) is more stable than (I)

B. Both (I) and (II) are aromatic and have the same stability

C. (II) is more aromatic and more stable than (I) and it is non-aromatic

D. (I) is more stable than (II) though both are aromatic.

Answer: A

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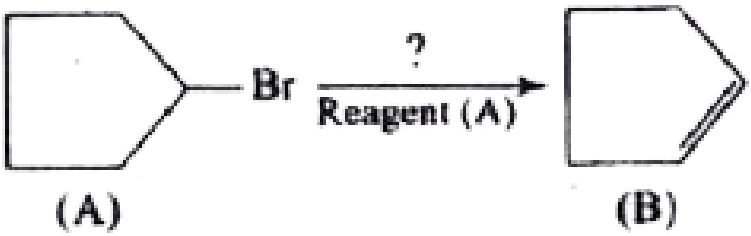
83. 

. Which reagent cannot be used for the above conversion?

A. 

B. Et_3N

C. $POCl_3$

D. NH_3

Answer: C

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84. The compound 1, 2-butadiene has:

A. only sp-hybridised carbon atoms

B. only sp^2-hybridised carbon atoms

C. both sp-and sp^2-hybridised carbon atoms

D. $sp-$, sp^2- and sp^3- hybridised carbon atoms

Answer: D

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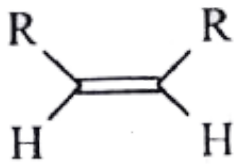
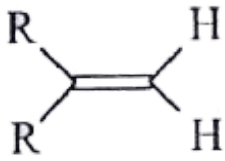
85. Which one of the following alkenes will react fastest with H_2 under catalytic hydrogenation condition?

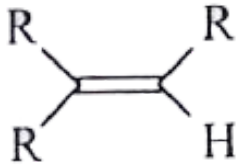
A.



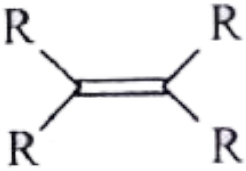
B.



C.



D.



Answer: A

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86. 2-Hexyne gives trans-2-hexene on treatment with:

A. Li / NH_3

B. $Pd / BasO_4$

C. $LiAlH_4$

D. Pt / H_2

Answer: A

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87. Oxidation of naphthalene by acidic $KMnO_4$ gives:

A. toluene

B. benzaldehyde

C. phthalic acid

D. benzoic acid

Answer: C

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88. Which of the following has maximum resonance energy?

A. Anthracene

B. Benzene

C. Naphthalene

D. Phenanthrene

Answer: D

Watch Video Solution

89. The synthesis of 3-octyne is achieved by adding a bromoalkane into a mixture of sodium amide and alkyne. The bromoalkane and alkyne, respectively, are

A. $BrCH_2CH_2CH_2CH_2CH_3$ and $CH_3CH_2C \equiv CH$

B. $BrCH_2CH_2CH_3$ and $CH_3CH_2CH_2C \equiv CH$

C. $BrCH_2CH_2CH_2CH_2CH_3$ and $CH_3C \equiv CH$

D. $BrCH_2CH_2CH_2CH_3$ and $CH_3CH_2C \equiv CH$

Answer: B

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90. On passing benzene vapour through a red hot tube at $700 - 800^{\circ} C$ or through molten lead we get:

A. diphenyl

B. phenol

C. toluene

D. benzaldehyde

Answer: A

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Level Ii

1. In reaction , $CH_2 = CH_2 \xrightarrow{\text{Hypochlorous acid}} A \xrightarrow{B} \begin{matrix} CH_2OH \\ | \\ CH_2OH \end{matrix}$, then A and B are :

A. CH_3CH_2Cl and NaOH

B. $CH_3 - CH_3$ and KOH

C. CH_3CH_2OH and HCl

D. $CH_2OH - CH_2Cl$ and aq. $NaHCO_3$

Answer: D

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2. Which of the following is the predominate product in the reaction of HOBr with propene?

A. 2-bromopropan-1-ol

B. 3-bromopropan-1-ol

C. 2-bromopropan-2-ol

D. 1-bromopropan-2-ol

Answer: D

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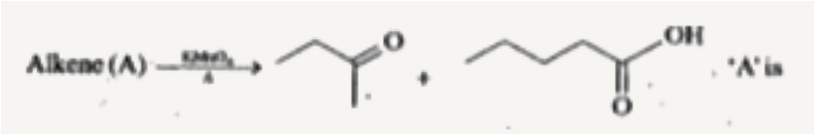
3. 

A. 

B. 

C. 

D. 

Answer: A

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4. $CH_3 - CH = CH_2 + NOCl \rightarrow P$. Identify the adduct.

A. $CH_3 - \underset{Cl}{CH} - \underset{NO}{CH_2}$

B. $CH_3 - \underset{NO}{CH} - \underset{Cl}{CH_2}$

C. $CH_3 - CH_2 - \underset{Cl}{\overset{NO}{\underset{|}{\overset{|}{C}}}}H$

D. $\underset{NO}{\underset{|}{C}}H_2 - CH_2 - \underset{Cl}{\underset{|}{CH_2}}$

Answer: B

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5. Which among the following is aromatic?

A. 

B. 

C. 

D. 

Answer: D

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6. In the following sequence of reactions: Toluene $\xrightarrow{KMnO_4} A \xrightarrow{SOCl_2} B \xrightarrow[BaSO_4]{H_2/Pd} C$, the product C is

A. $C_6H_5CH_3$

B. $C_6H_5CH_2OH$

C. C_6H_5CHO

D. C_6H_5COOH

Answer: C

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7. Addition of HBr on $CH \equiv C - CH_2 - CH = CH_2$ and $CH \equiv C - CH = CH_2$ separately gives :

A. $CH \equiv C - CH_2 - CHBr - CH_3$ and $CH_2 = \underset{\underset{Br}{|}}{C} - CH = CH_2$

B. $CH_2 = \underset{\underset{Br}{|}}{C} - CH_2 - CHBr - CH_2$ and $CH_2 = \underset{\underset{Br}{|}}{C} - CH = CH_2$

C. $CH \equiv C - CH_2 - \underset{\underset{Br}{|}}{CH} - CH_3$ and $CH \equiv C - \underset{\underset{Br}{|}}{CH} - CH_3$

D. None of these

Answer: A

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8. The hydrocarbon which decolourises alkaline $KMnO_4$ solution, but does not give any precipitate with ammoniacal silver nitrate is:

A. methane

B. acetlyene

C. ethane

D. ethylene

Answer: D

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9. In the complete combustion of C_nH_{2n+2} , the number of oxygen moles required is:

A. $\left(\frac{n}{2}\right)O_2$

B. $\left(\frac{n+1}{2}\right)O_2$

C. $\left(\frac{3n+1}{2}\right)O_2$

D. $\left(\frac{n+2}{2}\right)O_2$

Answer: C

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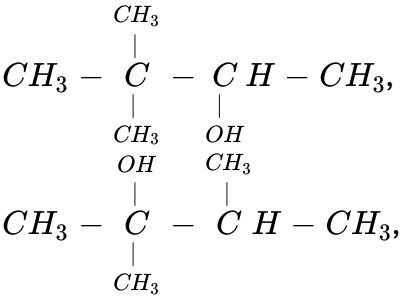
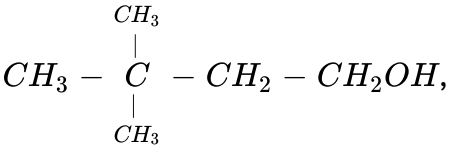
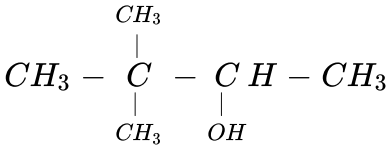
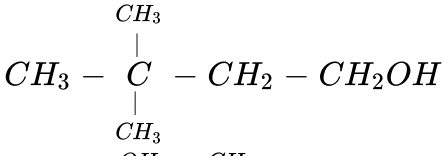
10. The product of following reaction is

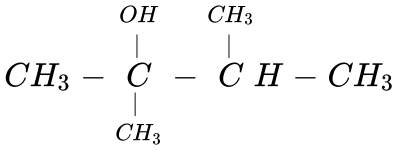
$$CH_3-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}}-CH=CH_2 \xrightarrow[(ii)\,NaBH_4+NaOH]{(i)\,Hg(CH_3COO)_2,THF}$$:

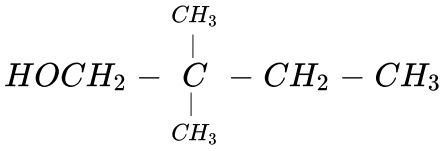




A. 

B. 

C. 

D. 

Answer: A

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11. The compound X(C_5H_8) reacts with ammoniacal $AgNO_3$ to give a white precipitate and reacts with excess of $KMnO_4$ to give the acid, $(CH_3)_2CH-COOH$. Therefore, X is:

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

B. $CH_3(CH_2)_2C \equiv CH$

C. $(CH_3)_2CHC \equiv CH$

D. $(CH_3)_2C = C = CH_2$

Answer: C

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12. What volume of CH_4 at NTP is formed when 20.5.g of CH_3COONa is treated with sodalime?

A. 4.4 litre

B. 2.2 litre

C. 3.2 litre

D. 5.6 litre

Answer: D

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13. Propene, $CH_3 - CH = CH_2$ can be converted into 1-propanol by oxidation. Which set of reagents among the following is ideal to effect the conversion?

A. Alkaline $KMnO_4$

B. B_2H_6 and alk. H_2O_2

C. O_3/ zinc dust

D. $OsO_4 / CHCl_3$

Answer: B

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14. Identify 'X' in the reaction : $Br - CH_2 - \underset{CH_2Br}{\overset{CH_2Br}{\overset{|}{\underset{|}{C}}}} - CH_2Br \xrightarrow{Zn / \Delta} X$, X is

A. $CH_3 - C = CH_2$
$\quad\quad\quad\;\; |$
$\quad\quad\quad CH = CH_2$

B.

C.

D. $CH_3C \equiv C - CH = CH_2$

Answer: B

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15. An alkene, obtained by the dehydration of an alcohol, on ozonolysis gives acetaldehyde only as the product. The alcohol is:

A. $CH_3CH_2CH_2OH$

B. CH_3CH_2OH

C. $CH_3CH = CHCH_2OH$

D. $CH_3CH_2\underset{\underset{OH}{|}}{C}HCH_3$

Answer: D

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16. Which compound on reductive ozonolysis forms only glyoxal?

A. Ethyne

B. Ethene

C. Ethane

D. 1,3-butadiene

Answer: A

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17. 10 ml of a certain hydrocarbon require 55 mL of oxygen for complete combustion and the volume of CO_2 produced is 40 mL. What is the formula of hydrocarbon?

A. C_4H_6

B. C_2H_4

C. CH_4

D. C_2H_6

Answer: A

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18. During ozonolysis of $CH_2 = CH_2$ if hydrolysis is made in absence of Zn dust the products formed are:

A. HCHO

B. HCOOH

C. CH_3OH

D. CH_2OHCH_2OH

Answer: B

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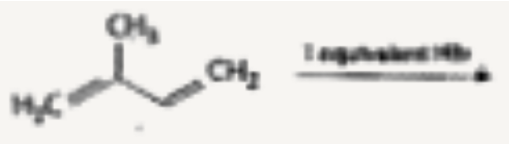
19. In the following reaction , the major product is



A. 

B. 

C. 

D. 

Answer: D

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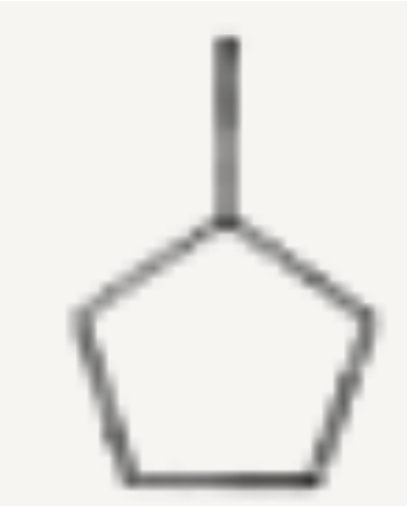
20. 

$\xrightarrow{Br_2/hv} X \xrightarrow{\text{Alc. KOH}} Y \xrightarrow{\text{HBr/Peroxide}} Z$. The compound Z is

A. 

B. 

C. 

D. 

Answer: C

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21. The compound (i) decolourises $KMnO_4$ (ii) forms ozonide with ozone and (iii) undergoes polymerization. It will be :

A. C_6H_6

B. C_3H_8

C. C_2H_4

D. C_2H_6

Answer: C

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22. A hydrocarbon X adds on one mole of hydrogen to give hydrocarbon and decolourised bromine water. X reacts with $KMnO_4$ in presence of acid to give two mole of the same carboxylic acid. The structure of X is :

A. $CH_3CH = CHCH_2CH_2CH_3$

B. $CH_3CH_2CH = CHCH_2CH_3$

C. $CH_3CH_2CH_2 - CH = CHCH_3$

D. $CH_2 = CH - CH_2CH_2CH_3$

Answer: B

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23. Which of the following molecules/species are aromatic in character?

A. 

B. 

C. 

D. 

Answer: C

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24. In the reaction, $C_6H_5CH_3 \xrightarrow{\text{Oxidation}} A \xrightarrow{\text{NaOH}} B \xrightarrow[\Delta]{\text{Soda lime}} C$ the product C is :

A. C_6H_5OH

B. C_6H_6

C. C_6H_5COONa

D. C_6H_5ONa

Answer: B

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25. Benzene contains double bonds but does not give addition reactions because:

A. double bonds in benzene are strong

B. double bonds change their position rapidly

C. resonance lowers the energy of benzene molecule and leads to greater stabilisation

D. none of the above

Answer: C

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26. The reaction of $C_6H_5CH=CHCH_3$ with HBr produces:

$C_6H_5\underset{\underset{Br}{|}}{C}HCH_3, C_6H_5CH_2CH_2CH_3Br, C_6H_5\underset{\underset{Br}{|}}{C}HCH_2CH_3$

A. $C_6H_5\underset{\underset{Br}{|}}{C}HCH_3$

B. $C_6H_5CH_2CH_2CH_3Br$

C. 

D. $C_6H_5\underset{\underset{Br}{|}}{C}HCH_2CH_3$

Answer: D

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27. Which product is formed when the following compound is treated with Br_2 in the presence of $FeBr_3$?

A. 

B. 

C. 

D. 

Answer: C

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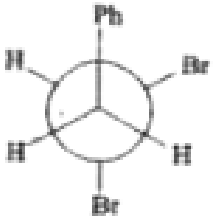
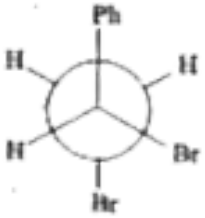
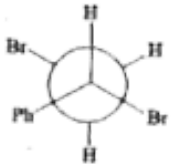
28. The most stable conformation of the products of following reaction is :

A. 

B. 

C. 

D. 

Answer: C

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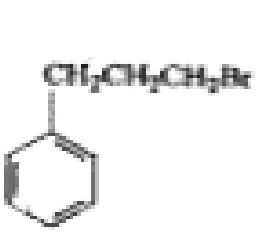
29. Provide the structure of the major products from the following

reaction



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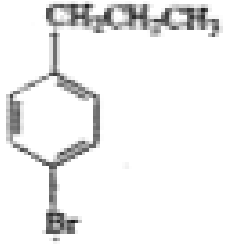

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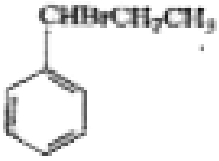
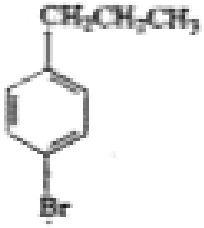


A.

B. 

C. 

D. 

Answer: D

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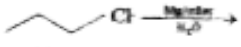
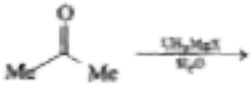
30. Which of the following reactions will not give propane ?

A. 

B. 

C. 

D. 

Answer: D

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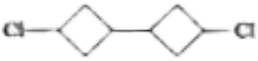
31. Identify the product formed when formaldehyde reacts with NH_3. Write the use of the compound formed.

A. 

B. 

C. 

D. 

Answer: C

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32. Out of the following compounds , I)Pent-1-ene , II)Pent-2-ene , III)2-Methyl but-1-ene , IV) 2-Methyl but-2-ene . Which pair has the lowest and the highest heats of combustion , respectively ?

A. (IV) and (I) respectively

B. (I) and (IV) respectively

C. (II) and (III) respectively

D. (III) and (II), respectively

Answer: A

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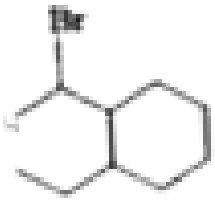
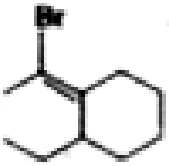
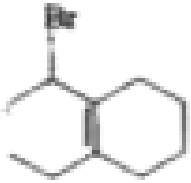
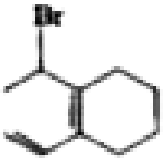
33. Which of the following will undergo faster dehydrobromination ?

A. 

B. 

C. 

D. 

Answer: D

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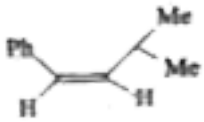
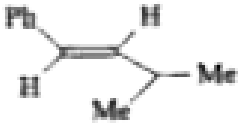
34. 

A. 

B. 

C. 

D. All

Answer: C

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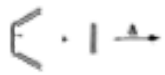
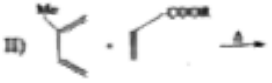
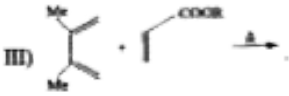
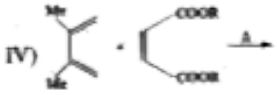
35. Give the decreasing order of reactivity of Diels-Alder reactions for the following :

I) 

II) 

III) 

IV) 

A. $(I) > (II) > (III) > (IV)$

B. $(IV) > (III) > (II) > (I)$

C. $(IV) > (III) > (I) > (II)$

D. $(II) > (I) > (III) > (IV)$

Answer: B

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36. 2-Phenyl propene on acidic hydration gives :

A. 2-phenyl-2-propanol

B. 2-phenyl-1-propanol

C. 3-phenyl-1-propanol

D. 1-phenyl-2-propanol

Answer: A

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37.

The product (Y) is

A.

B.

C.

D.

Answer: B

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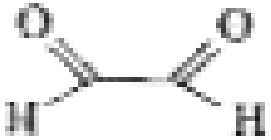
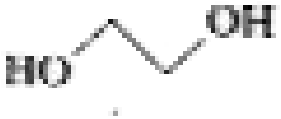
38. $H - \equiv - H \xrightarrow[(ii)\, H_2O / Zn]{(i)\, O_3} (X) \xrightarrow{Zn / CH_3COOH} (Y)$. Compound (Y) :



, $Me - COOH$,



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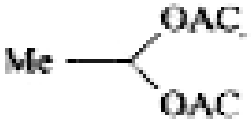
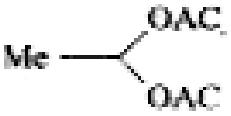


A.

B. Me-COOH

C. 

D. 

Answer: C

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39. What product would you expect from addition of deuterium chloride to 2-cyclohexyl-4-methyl-2-pentene ?

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40. In reaction,

$$CH_2 = CH_2 \xrightarrow{\text{Hypochlorous acid}} A \xrightarrow{B} \begin{matrix} CH_2OH \\ | \\ CH_2OH \end{matrix},$$

, then A and B

are:

A. CH_3CH_2Cl and $NaOH$

B. $CH_3 - CH_3$ and KOH

C. CH_3CH_2OH and HCl

D. $CH_2OH - CH_2Cl$ and $aq. NaHCO_3$

Answer: D

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41. Which of the following is the predominate product in the reaction of HOBr with propene?

A. 2-bromopropan-1-ol

B. 3-bromopropan-1-ol

C. 2-bromopropan-2-ol

D. 1-bromopropan-2-ol

Answer: D

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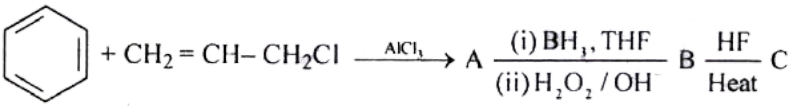
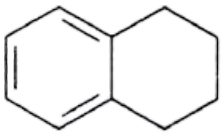
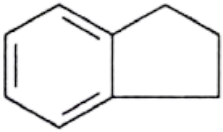
42. Identify 'C' in the following reaction:



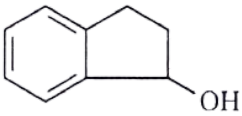
A.



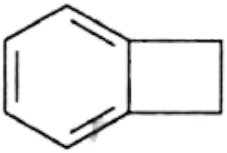
B.



C.



D.



Answer: B

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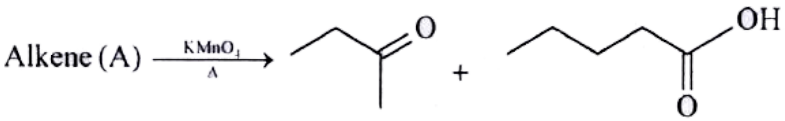
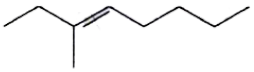
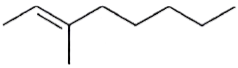
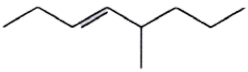
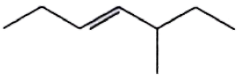
43. 

. 'A' is

A. 

B. 

C. 

D. 

Answer: A

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44. $CH_3 - CH = CH_2 + NOCl \rightarrow P$. Identify the adduct.

A. $CH_3 - \underset{\underset{Cl}{|}}{CH} - \underset{\underset{NO}{|}}{CH_2}$

B. $CH_3 - \underset{\underset{NO}{|}}{CH} - \underset{\underset{\underset{NO}{|}}{Cl}}{CH_2}$

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

D. $\underset{\underset{NO}{|}}{CH_2} - CH_2 - \underset{\underset{Cl}{|}}{CH_2}$

Answer: B

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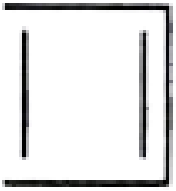
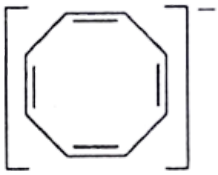
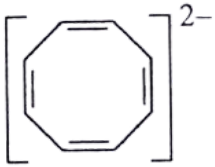
45. Which among the following is aromatic?



A.

B. 

C. 

D. 

Answer: D

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46. In the following sequence of reactions: Toluene $\xrightarrow{KMnO_4} A \xrightarrow{SOCl_2} B \xrightarrow[BaSO_4]{H_2/Pd} C$, the product C is

A. $C_6H_5CH_3$

B. $C_6H_5CH_2OH$

C. C_6H_5CHO

D. C_6H_5COOH

Answer: C

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47. Addition of HBr on $CH \equiv C - CH_2 - CH = CH_2$ and $CH \equiv C - CH = CH_2$ separately gives :

A. $CH \equiv C - CH_2 - CHBr - CH_3$ and $CH_2 = \underset{\underset{Br}{|}}{C} - CH = CH_2$

B. $CH = \underset{\underset{Br}{|}}{C} - CH_2 - CHBr - CH_2$ and $CH_2 = \underset{\underset{Br}{|}}{C} - CH = CH_2$

C. $CH \equiv C - CH_2 - \underset{\underset{Br}{|}}{CH} - CH_3$ and $CH_2 \equiv C - \underset{\underset{Br}{|}}{CH} = CH_3$

D. None of these

Answer: A

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48. The hydrocarbon which decolourises alkaline $KMnO_4$ solution, but does not give any precipitate with ammoniacal silver nitrate is:

A. benzene

B. acetlyene

C. propyne

D. butyne-2

Answer: D

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49. In the complete combustion of C_nH_{2n+2} , the number of oxygen moles required is:

A. $\left(\frac{n}{2}\right)O_2$

B. $\left(\frac{n+1}{2}\right)O_2$

C. $\left(\frac{3n+1}{2}\right)O_2$

D. $\left(\frac{n+2}{2}\right)O_2$

Answer: C

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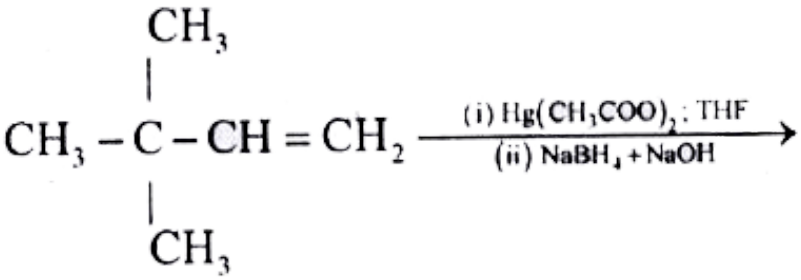
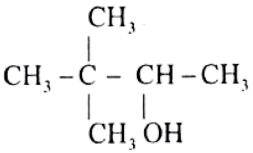
50. The product of following reaction is



A.



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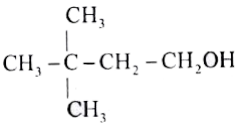

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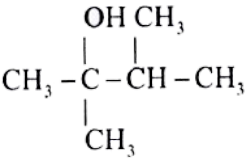
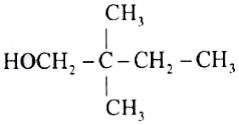


D. 

Answer: A

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51. The compound X(C_5H_8) reacts with ammoniacal $AgNO_3$ to give a white precipitate and reacts with excess of $KMnO_4$ to give the acid, $(CH_3)_2CH-COOH$. Therefore, X is:

A. $CH_2=CH-CH-CH_3$

B. $CH_3(CH_2)_2C\equiv CH$

C. $(CH_3)_2CHC\equiv CH$

D. $(CH_3)_2C=C=CH_2$

Answer: C

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52. What volume of CH_4 at NTP is formed when 20.5.g of CH_3COONa is treated with sodalime?

A. 4.4 litre

B. 2.2 litre

C. 3.2 litre

D. 5.6 litre

Answer: D

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53. Propene, $CH_3 - CH = CH_2$ can be converted into 1-propanol by oxidation. Which set of reagents among the following is ideal to effect the conversion?

A. Alkaline $KMnO_4$

B. B_2H_6 and $alk.\ H_2O_2$

C. O_3 / zinc dust

D. $OsO_4 / CHCl_3$

Answer: B

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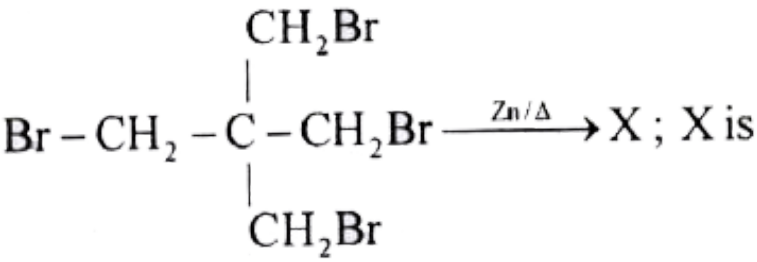
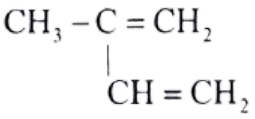
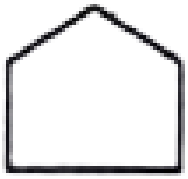
54. Identify 'X' in the reaction:



A. 

B. 

C. 

D. $CH_3C \equiv C - CH = CH_2$

Answer: B

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55. An alkene, obtained by the dehydration of an alcohol, on ozonolysis gives acetaldehyde only as the product. The alcohol is:

A. $CH_3CH_2CH_2OH$

B. CH_3CH_2OH

C. $CH_3CH = CHCH_2OH$

D. $CH_3CH_2\underset{\underset{OH}{|}}{C}HCH_3$

Answer: D

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56. Which compound on reductive ozonolysis forms only glyoxal?

A. Ethyne

B. Ethene

C. Ethane

D. 1,3-butadiene

Answer: A

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57. 10 ml of a certain hydrocarbon require 55 mL of oxygen for complete combustion and the volume of CO_2 produced is 40 mL. What is the formula of hydrocarbon?

A. C_2H_2

B. C_2H_4

C. CH_4

D. C_2H_6

Answer: A

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58. During ozonolysis of $CH_2 = CH_2$ if hydrolysis is made in absence of Zn dust the products formed are:

A. HCHO

B. HCOOH

C. CH_3OH

D. CH_2OHCH_2OH

Answer: B

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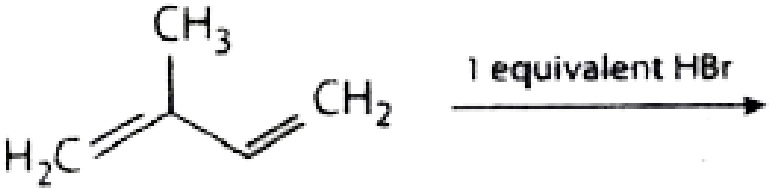
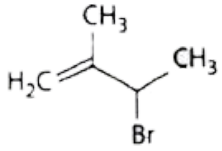
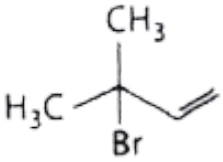
59. In the following reaction, the major product is



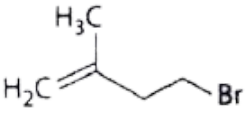
A.



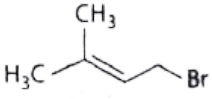
B.



C.



D.



Answer: D

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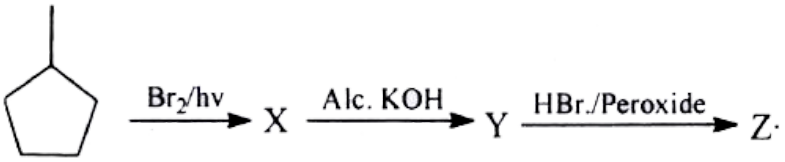
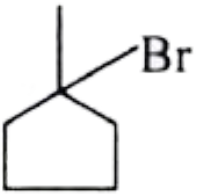
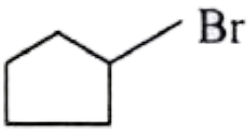
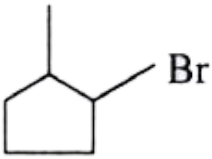
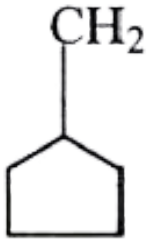


60. . The compound Z is

A. 

B. 

C. 



D.

Answer: C

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61. The compound (i) decolourises $KMnO_4$ (ii) forms ozonide with ozone and (iii) undergoes polymerization. It will be :

A. C_6H_6

B. C_3H_8

C. C_2H_4

D. C_2H_6

Answer: C

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62. A hydrocarbon X adds on one mole of hydrogen to give hydrocarbon and decolourised bromine water. X reacts with $KMnO_4$ in presence of acid to give two mole of the same carboxylic acid. The structure of X is :

A. $CH_3CH = CHCH_2CH_2CH_3$

B. $CH_3CH_2CH = CHCH_2CH_3$

C. $CH_3CH_2CH_2 - CH = CHCH_3$

D. $CH_2 = CH - CH_2CH_2CH_3$

Answer: B

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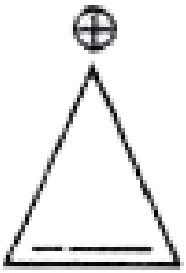
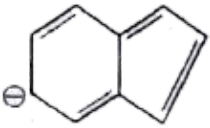
63. Which of the following molecules/species are aromatic in character?

A. 

B. 

C. 

D. 

Answer: C

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64. In the reaction, $C_6H_5CH_3 \xrightarrow{\text{Oxidation}} A \xrightarrow{NaOH} B \xrightarrow[\Delta]{\text{Soda lime}} C$ the product C is :

A. C_6H_5OH

B. C_6H_6

C. C_6H_5COONa

D. C_6H_5Ona

Answer: B

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65. Benzene contains double bonds but does not give addition reactions because:

A. double bonds in benzene are strong

B. double bonds change their position rapidly

C. resonance lowers the energy of benzene molecule and leads to greater stabilisation

D. none of the above

Answer: C

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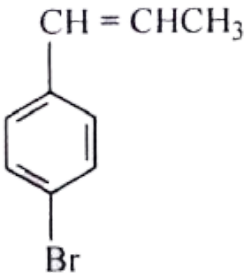
66. The reaction of $C_6H_5CH=CHCH_3$ with HBr produces:

$C_6H_5\underset{\underset{Br}{|}}{C}H_2CHCH_3, C_6H_5CH_2CH_2CH_3Br, C_6H_5\underset{\underset{Br}{|}}{C}HCH_2CH_3$

A. $C_6H_5\underset{\underset{Br}{|}}{C}H_2CHCH_3$

B. $C_6H_5CH_2CH_2CH_2Br$

C. 

D. $C_6H_5\underset{\underset{Br}{|}}{C}HCH_2CH_3$

Answer: D

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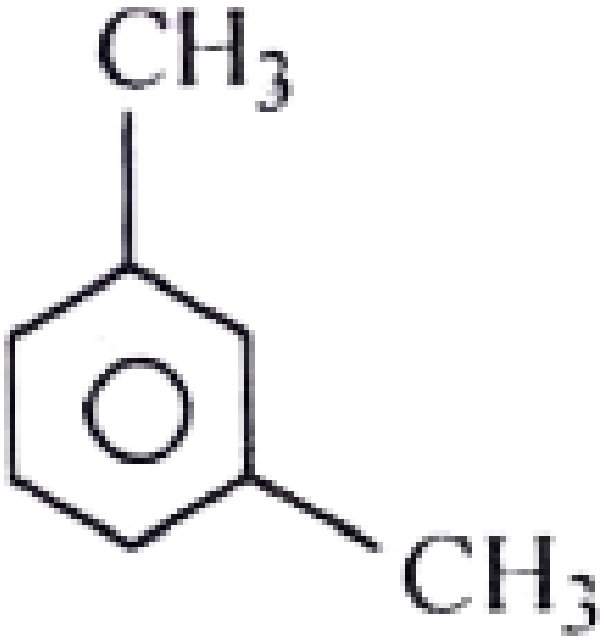
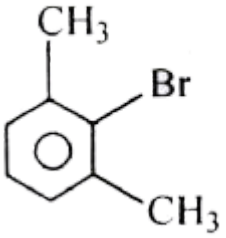
67. Which product is formed when the following compound is treated with Br_2 in the presence of $FeBr_3$?



A.



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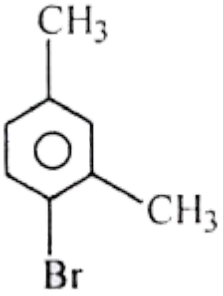
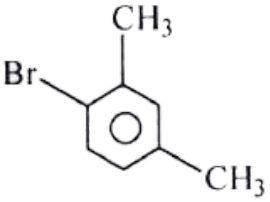
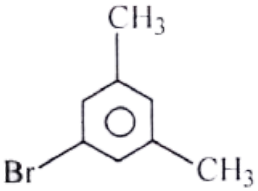


C.



D.



Answer: C

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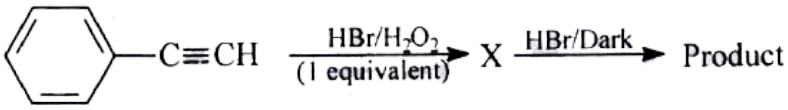
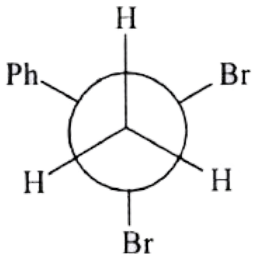
68. The most stable conformation of the product of following reaction is:



A.



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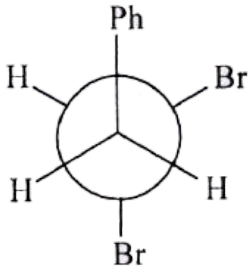

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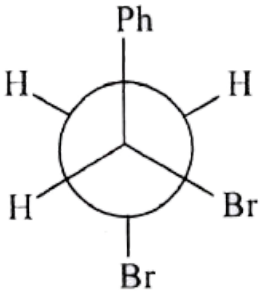

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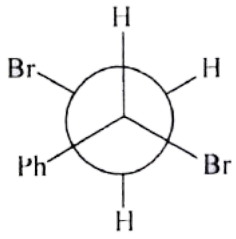

Answer: C

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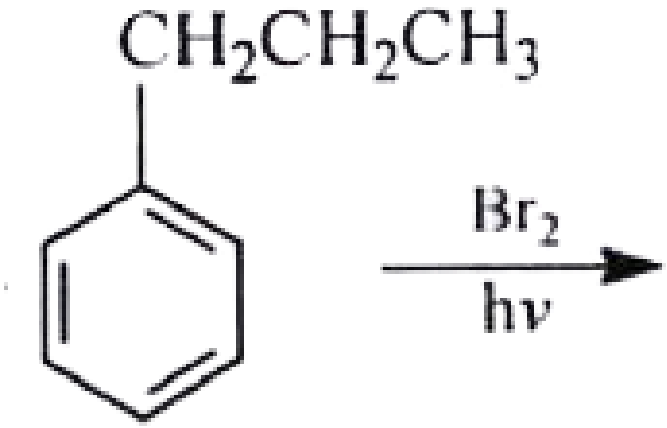
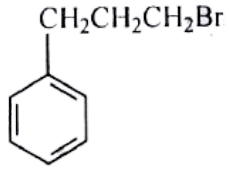
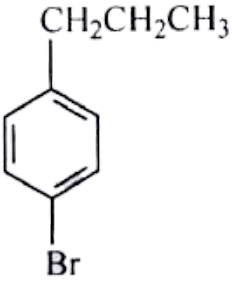
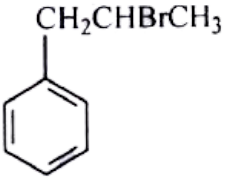
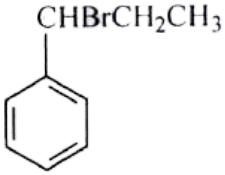
69. Provide the structure of the major product(s) from the following reaction.



A. 

B. 

C. 

D. 

Answer: D

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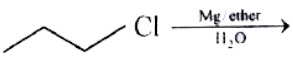
70. Which of the following reactions will not give propane? :



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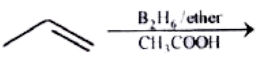

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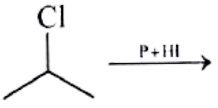

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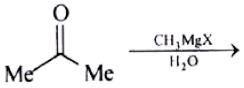
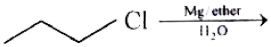
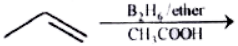
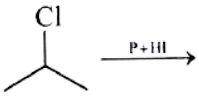
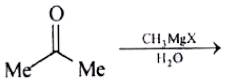


A. 

B. 

C. 

D. 

Answer: D

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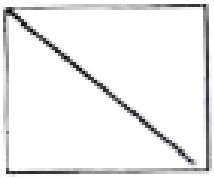
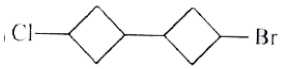
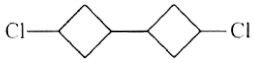
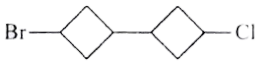
71. What would be the product formed when 1-bromo-3-chlorocyclobutane reacts with two equivalents of metallic sodium in water ?

A. 

B. 

C. 

D. 

Answer: C

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72. Out of the following compounds , I)Pent-1-ene , II)Pent-2-ene , III)2-Methyl but-1-ene , IV) 2-Methyl but-2-ene . Which pair has the lowest and

the highest heats of combustion , respectively ?

A. (IV) and (I), respectively

B. (I) and (IV), respectively

C. (II) and (III), respectively

D. (III) and (II), respectively

Answer: A

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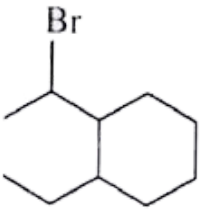
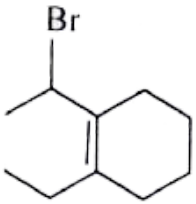
73. Which of the following will undergo faster dehydrobromination ?

A.

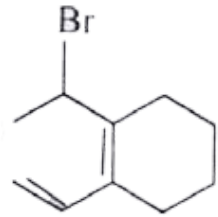


B.

C.



D.



Answer: D

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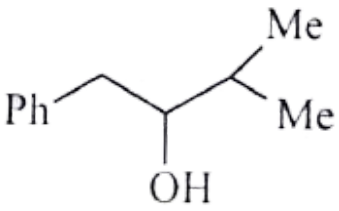
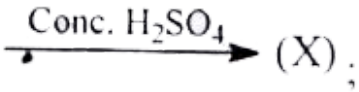
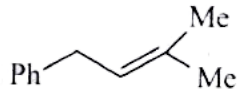
74. Match the following columns





A.



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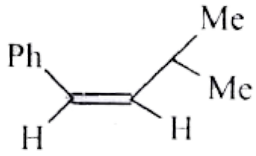
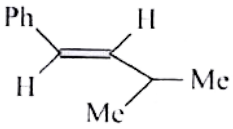


C.



D. All

Answer: C

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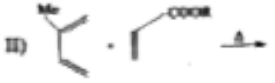
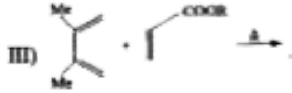
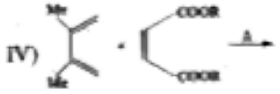
75. Give the decreasing order of reactivity of Diels-Alder reactions for the following :

I) 

II) 

III) 

IV) 

A. $(I) > (II) > (III) > (IV)$

B. $(IV) > (III) > (II) > (I)$

C. $(IV) > (III) > (I) > (II)$

D. $(II) > (I) > (III) > (IV)$

Answer: B

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76. 2-Phenyl propene on acidic hydration gives :

A. 2-phenyl-2-propanol

B. 2-phenyl-1-propanol

C. 3-phenyl-1-propanol

D. 1-phenyl-2-propanol

Answer: A

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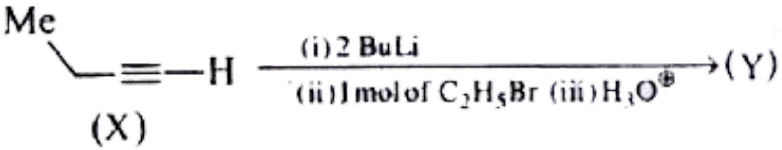
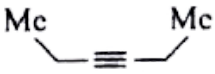
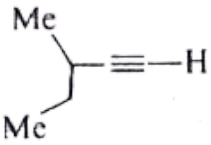
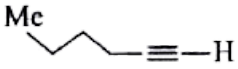
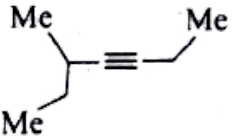


77. The product (Y) is

A. 

B. 

C. 

D. 

Answer: B

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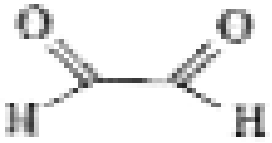
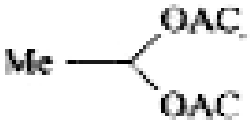
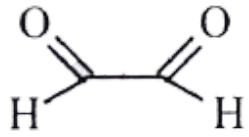
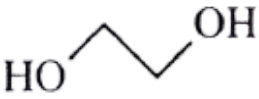
78. $H - \equiv - H \xrightarrow[(ii)\, H_2O / Zn]{(i)\, O_3} (X) \xrightarrow{Zn / CH_3COOH} (Y)$. Compound (Y) :

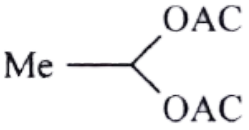
 , $Me - COOH$,  ,



A. 

B. Me - COOH

C. 

D. 

Answer: C

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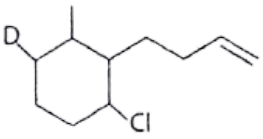
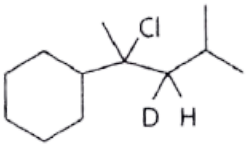
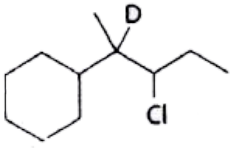
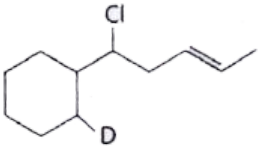
79. What product would you expect from addition of deuterium chloride to 2-cyclohexyl-4-methyl-2-pentene ?

A. 

B. 

C. 

D. 

Answer: B

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Level Ii Assertion Reason Type

1. Assertion : Chair conformation of cyclohexane is more stable than boat conformation.

Reason : In boat form, many hydrogen atoms on adjacent carbon atoms have eclipsed conformation.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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2. Assertion : 2-bromobutane on treatment with alcoholic KOH gives 2-butene.

Reason : Secondary hydrogen is more acidic than primary hydrogen.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: C

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3. Assertion : Ethene as well as benzene are planar molecules.

Reason : All the carbon atoms in ethene as well as benzene are sp^2 hybridized.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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4. Assertion : Benzene does not give addition reactions readily.

Reason : π-electrons are delocalised over the entire skeleton of six carbon atoms

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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5. Assertion : But-1-ene and 2-methylprop-1-ene are position isomers.

Reason : Position isomers have same molecular formula but different arrangement of carbon atoms.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: D

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6. Assertion : With respect to alkenes, the electrophilic addition reaction is reversible.

Reason : Because, the direction of the reaction is controlled by decrease in free energy of the reaction.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

View Text Solution

7. Assertion : Chlorination of methane is a free radical reaction.

Reason : Chlorination of methane takes place in sunlight.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

Watch Video Solution

8. Assertion : trans-2-Butene on reaction with Br_2 gives meso-2,3-dibromobutane.

Reason : The reaction involves syn-addition of bromine.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: C

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9. Assertion : Acetylene on reacting with sodamide gives sodium acetylide and ammonia.

Reason : sp hybridised carbon atoms ofacetylene are considerably electronegative.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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10. Assertion : Friedel-Crafts reaction between benzene and acetic anhydride in the presence of anhydrous $AlCl_3$ yields acetophenone and not poly substituted products.

Reason : Acetophenone formed poisons the catalyst preventing further reaction.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: C

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11. Assertion : Dimethyl sulphide is commonly used for the reduction of an ozonide of an alkene to get the carbonyl compounds.

Reason : It reduces the ozonide giving water soluble dimethyl sulphoxide and excess of it evaporates.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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12. Assertion : The reaction of conc. HNO_3 and conc.H_2SO_4 on nitrobenzene gives m-dinitrobenzene.

Reason : The nitro group in benzene ring decreases the electron density in the benzene ring.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: B

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13. Assertion : Melting point of neopentane is higher than that of n-pentane but the boiling point of n-pentane is higher than that of neopentane.

Reason : Melting point depends upon packing of molecules in the crystal lattice while boiling point depends upon surface area of the molecule.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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14. Assertion : C-H bond in ethyne is shorter than C-H bonds in ethene.

Reason : Carbon atom in ethene is sp hybridised while it is sp^3 in ethyne.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: C

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15. Assertion : Alkynes are more reactive towards nucleophilic addition reaction as compared to alkenes.

Reason : Alkynes contain two pi bonds, while alkenes have only one pi bond.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: B

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16. Assertion : Benzene does not decolourize Br_2-water.

Reason : Benzene is stabilized by resonance due to delocalization of π -electrons.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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17. Assertion : Pent-1-ene and pent-2-ene are position isomers.

Reason : Position isomers differ in the position of functional group or a

substituent.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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18. Assertion : Butane and 2-methylbutane are homologues.

Reason : Butane is a straight chain alkane while 2-methyl-butane is a branched chain alkane.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: B

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19. Assertion : 2,3-dimethyl but-2-ene is more stable than but-2-ene.

Reason : 2,3-dimethyl but-2-ene possesses 12 α-hydrogen atoms whereas but-2-ene possesses only 6α-hydrogen atoms and therefore former shows more pronounced hyperconjugation.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: A

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20. Assertion : Tropylium cation is aromatic in nature.

Reason : The only property that determines its aromatic behaviour is its planar structure.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

C. If Assertion is correct , but Reason is incorrect.

D. If both Assertion and Reason are incorrect .

Answer: C

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Level Iii Single Correct Answer Type

1. Sample of 2,3-dibromo-3-methylpentane is heated with zinc dust. The resulting product is isolated and heated with HI in the presence of phosphorous. Indicate which is the structure that represents the final organic product in the reaction?

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

B. $CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - CH_3$

C. $CH_3 = \underset{\underset{I}{|}}{CH} - \underset{\underset{CH_3}{|}}{CH} - CH_2 - CH_3$

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

Answer: B

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2. A hydrocarbon of formula C_6H_{10} absorbs only one molecule of H_2 upon catalytic hydrogenation. Upon ozonolysis the hydrocarbon yields, $O = \overset{H}{\underset{|}{C}} - CH_2 - CH_2 - CH_2 - CH_2 - \overset{H}{\underset{|}{C}} = O$. The hydrocarbon is:

A. cyclohexane

B. benzene

C. cyclohexene

D. cyclobutane

Answer: C

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3. 2,3-Dimethyl-2-butene can be prepared by heating which of the following compounds with a strong acid?

A. $(CH_3)_2CH-\underset{\underset{CH_3}{|}}{CH}-CH=CH_2$

B. $(CH_3)_3C-CH=CH_2$

C. $(CH_3)_2C=CH-CH_2-CH_3$

D. $(CH_3)_2CH-CH_2-CH=CH_2$

Answer: B

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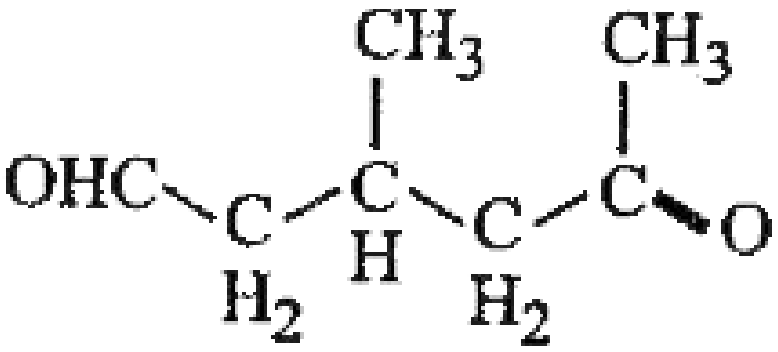
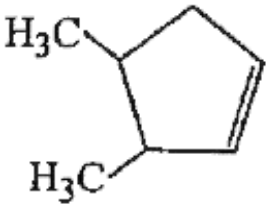
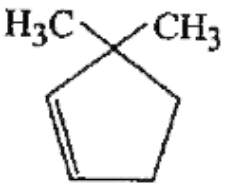
4. A single compound of the structure



is obtainable from ozonolysis of which of the following cyclic compounds?



A.



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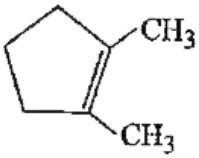
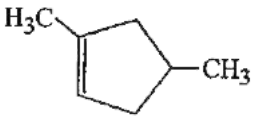


C.

D. 

Answer: D

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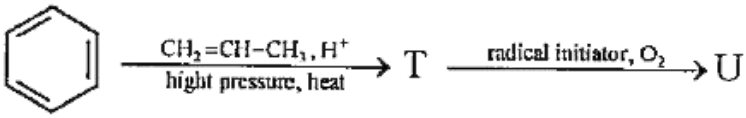
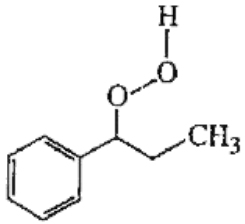
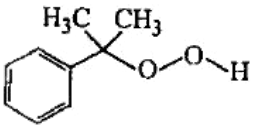
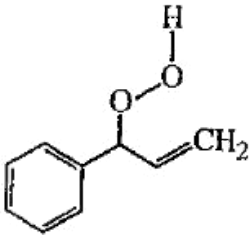
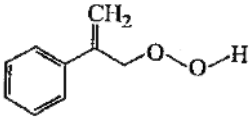
5. The major product 'U' in the following reactions is:



A. 

B. 

C. 

D. 

Answer: B

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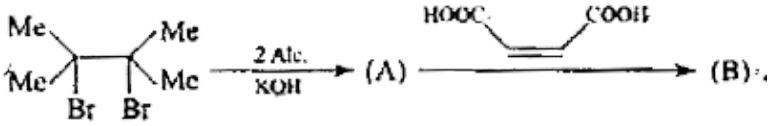
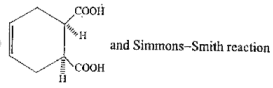
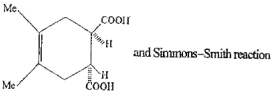
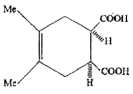
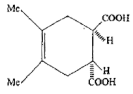
6. 

. Product (B) and name of the reaction in the formation of (B) are:

A. 

B. 

C.  and Diels–Alder reaction

D.  and Diels–Alder reaction

Answer: C

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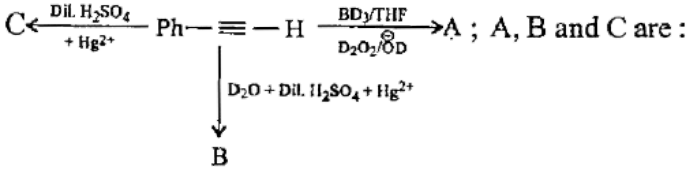
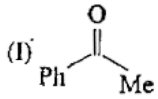
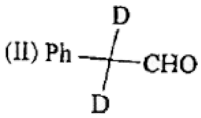
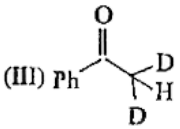
7. Match the following columns









A. (I), (II) and (III)

B. (II), (I), and (III)

C. (II), (III), and (I)

D. (I), (III), and (II)

Answer: C

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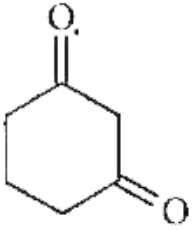
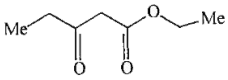
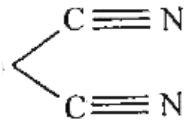
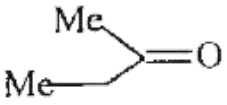
8. Which of the following compounds contain active methylene group?

A. 

B. 

C. 

D. 

Answer: A::B::C

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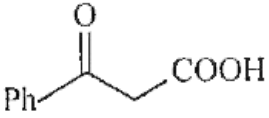
9. Which of the following compounds undergoes easy decarboxylation on heating?



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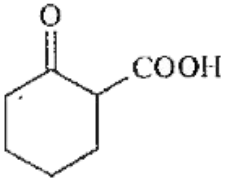

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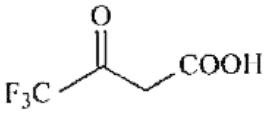

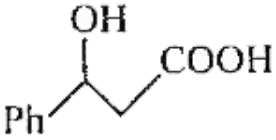

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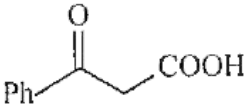
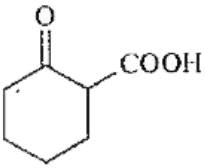
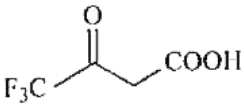
A.



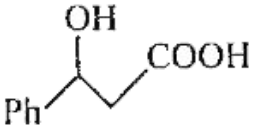
B.



C.



D.



Answer: A::B

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10. Which of the statements are not correct?

A. Alkenes are more reactive than alkynes towards electrophilic addition reaction.

B. Alkynes are more reactive than alkenes towards nucleophilic addition reaction.

C. Towards catalytic hydrogenation, alkynes are more reactive than alkenes.

D. Towards catalytic hydrogenation, alkenes are more reactive than alkynes.

Answer: A::B::C

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11. Which statements are correct about the given reaction?

$$HC \equiv CH \xrightarrow[+Hg^{2+}]{Dil.\ H_2SO_4} CH_3CH = O$$

A. A.C atom accepting the H is reduced, and the C atom forming a bond with OH is oxidised.

B. B. Given reaction is a redox reaction.

C. C. The average oxidation number of the two C atoms in each compound is same (-1).

D. D. The average oxidation number of the two C atoms in each compound is same (-2). The net effect is no change in average oxidation state.

Answer: A::B::C

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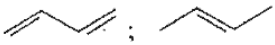
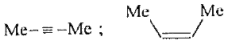
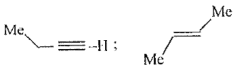
12. $\underset{(A)}{C_4H_6} \xrightarrow[1\text{ mol}]{H_2+Pt} \underset{(B)}{C_4H_8} \xrightarrow{O_3/H_2O}$ Acetic acid. (A) and (B) respectively are:

A. 

B. 

C. 

D. 

Answer: A::C

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13. Some oxidation reactions of methane are given below. Which of them are controlled oxidation reactions?

A. $CH_{4(g)} + 2O_{2(g)} \rightarrow CO_{2(g)} + 2H_2O_{(l)}$

B. $CH_{4(g)} + O_{2(g)} \rightarrow C_{(s)} + 2H_2O_{(l)}$

C. $CH_{4(g)} + O_{2(g)} \xrightarrow{Mo_2O_3} HCHO + H_2O$

D. $2CH_{4(g)} + O_{2(g)} \xrightarrow{Cu/523/100 \text{ atm}} 2CH_3OH$

Answer: C::D

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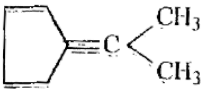
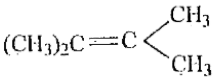
14. Which of the following alkenes on ozonolysis give a mixture of ketones only?

A. $CH_3 - CH = CH - CH_3$

B. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH = CH_2$

C. 

D. 

Answer: C::D

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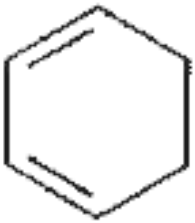
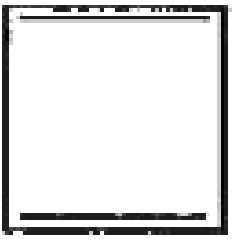
15. Which of the following molecules, in pure form are unstable at room





temperature?

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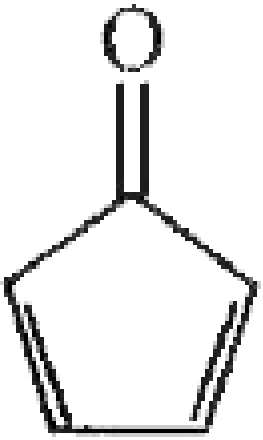

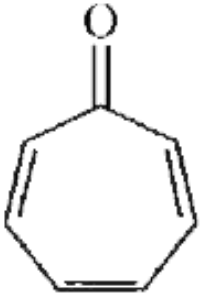

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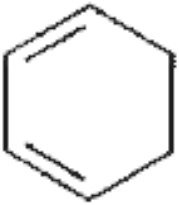
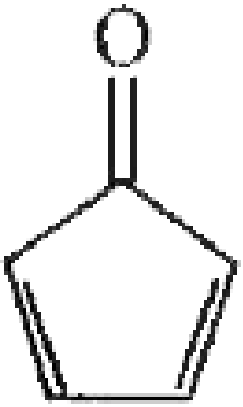
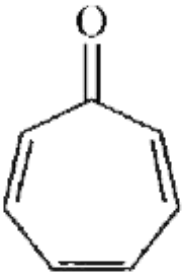


A.

B.



C.



D.

Answer: B::C

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16. Which of the following statements is/are correct?

A. The reductive and oxidative ozonolysis of m-and p-xylenes give the same product

B. The reductive ozonolysis of o-xylene (1,2-dimethyl benzene) gives glyoxal + methylglyoxal + dimethyl glyoxal in 3 : 2 : 1 ratio.

C. The ozonolysis of o-xylene establishes the Kekule's structure of benzene and also proves the existence of resonance in benzene

D. The oxidation of benzene with acidic $KMnO_4$ gives 3 mol oxalic acid.

Answer: A::B::C

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17. Which of the following statements are correct. : Hydrogenation of but-2-yne in the presence of Lindlar's catalyst yields cis-but-2-ene;

Hydrogenation of peni-2-yne in the presence of P-2 catalyst yields trans-pent-2-ene; Hydrogenation of pent-2-yne in the presence of K (potassium) and liquid NH_3 yields trans-pent-2-ene; Hydrogenation of but-2-yne in the presence of $LiAlH_4$ yields cis-but-2-ene

A. Hydrogenation of but-2-yne in the presence of Lindlar's catalyst yields cis-but-2-ene

B. Hydrogenation of peni-2-yne in the presence of P-2 catalyst yields trans-pent-2-ene

C. Hydrogenation of pent-2-yne in the presence of K (potassium) and liquid NH_3 yields trans-pent-2-ene

D. Hydrogenation of but-2-yne in the presence of $LiAlH_4$ yields cis-but-2-ene

Answer: A::C

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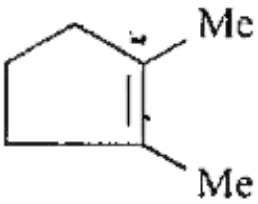
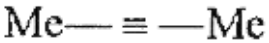
18. Hydroboration oxidation and acid hydration will yield the same





product in case of :

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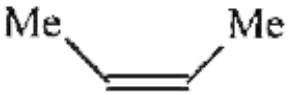

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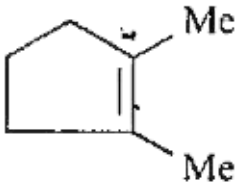
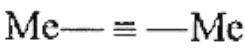
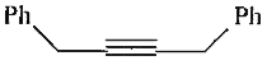


A.



B.

C.



D.

Answer: A::B::C::D

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19. $CH \equiv CH + 2CH_3COOH \xrightarrow[2.\ \Delta\ ,300-400^\circ C]{1.\ Hg^{2+}}$ Products. Products are :

A. $CH_3 - CH(OCOCH_3)_2$

B. CH_3CHO

C. $CH_3 - \overset{O}{\overset{||}{C}} - OCH_3$

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

Answer: B::D

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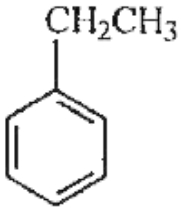
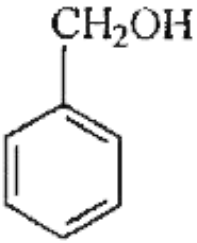
20. Benzoic acid may be prepared by the oxidation of

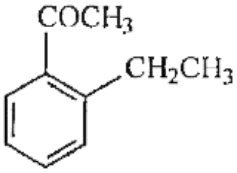
A.



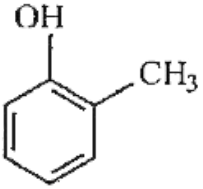
B.



C.



D.



Answer: A::B

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Level Iii Numerical Type

1. How many of the following on reductive ozonolysis will give only glyoxal?

1,3-butadiene, ethylene, acetylene, o-xylene, m-xylene, p-xylene, benzene, cyclobutadiene, cyclooctatetraene.

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2. How many of the following species are aromatic in nature?

cyclopentadienyl cation, cyclopentadienyl anion, tropylium cation, cyclopropenyl cation, furan

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3. Which of the following molecules have zero dipole moment?

cis-1, 2-dichloroethene, trans-1, 2-dichloroethene, trans-2-pentene, cis-2-pentene,

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4. how many alkenes are possible by the dehydrobromination of 3-bromo-3-cyclopentylhexane using alcoholic KOH is .....

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5. An alkyne having molecular mass x $\times$ 10 (A) is treated with Lindlar's catalyst and H_2 to give a compound (B). (B) reacts with HCl to give a compound (C). When (C) reacts with metallic sodium in presence of ether it gives (D). The molecular mass of (D) is 86. What is the value of x?

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6. How many eclipsed conformations are possible in butane?

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7. The number of π-bonds in the product formed by passing acetylene through dilute sulphuric acid containing mercuric sulphate is .....

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8. The number of meta directing groups among the following species are

$-NO_2,\ -SO_3H,\ -Cl,\ -OH,\ -NH_2,\ -CHO$

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Level Iii Matching Column Type

1. Match the following columns

	Column I		Column II
A)	Kolbe's electrolysis	p)	Alkanes
B)	Ozonolysis	q)	Alkenes
C)	Electrophilic substitution	r)	Alkynes
D)	Electrophilic addition	s)	Arenes

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2. Match the following columns

Column I		Column II	
A)	Addition of sulphuric acid to propene	p)	Anti-Markovnikov's addition
B)	Hydroboration-oxidation of propene	q)	Markovnikov's addition
C)	Hydroboration of propene	r)	n-Propyl alcohol
D)	Oxymercuration-demercuration of propene	s)	Isopropyl alcohol

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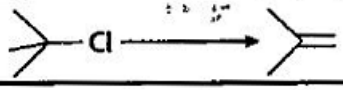
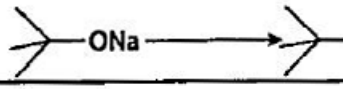
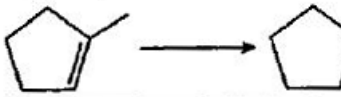
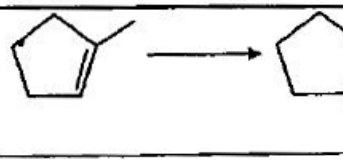
3. Match the chemical conversions in Column I with the appropriate reagents in Column II.

Column I	Column II
A) 	(p) 1. $Hg(OAc)_2$; 2. $NaBH_4$
B) 	(q) NaOEt
C) 	(r) EtBr
D) 	(s) 1. BH_3; 2. $H_2O_2/NaOH$

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4. Match the following columns

Column I		Column II	
Reactions		**Products**	
A)	Pent-2-yne $\xrightarrow[+Hg^{2+}]{\text{Dil. } H_2SO_4}$	p)	Rac-2, 3-Dibromo butane
B)	Pent-2-yne $\xrightarrow[(2)\ H_2O_2 + \overset{\ominus}{O}H]{(1)\ BH_3 + THF}$	q)	Meso-2, 3-Dibromo butane
C)	Pent-2-yne $\xrightarrow[(2)\ H_2O_2 + \overset{\ominus}{O}H]{(1)\ Sia_2BH}$	r)	Pentan-2-one
D)	But-2-yne $\xrightarrow[(2)\ Br_2]{(1)\ H_2 + Ni_2B}$	s)	Pentan-3-one
E)	But-2-yne $\xrightarrow[(2)\ Br_2]{(1)\ Na + EtOH}$		

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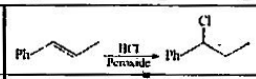
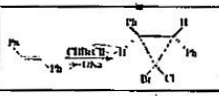
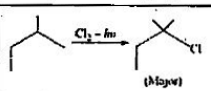
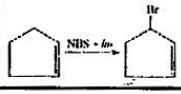
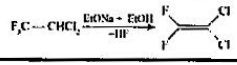
5. Match the following columns

Column I (Reactant, reagent and product)		Column II (Intermediate involved)	
A)		p)	Carbene
B)		q)	Free radical
C)		r)	Carbanion
D)		s)	Carbocation
E)			

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6. Match the following columns

Column I Cyclohexane conformations		Column II Characteristics	
A)	Chair form	p)	Four skew and two eclipsed positions
B)	Boat form	q)	Least stable form
C)	Half chair form	r)	Bond opposition strain
D)	Twist or skew boat form	s)	All (C – H) bonds on adjacent C are in skew position, ie, six skew positions
		t)	Free from angle strain

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Level Iii Statement Type

1. Statement 1 : Addition of bromine to butane gives 1,4-dibromobutane. Statement 2 : Alkanes do not undergo addition reactions. : Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.; Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.; Statement 1 is True, Statement 2 is False.; Statement 1 is False, Statement 2 is True.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: D

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2. Assertion : Chair conformation of cyclohexane is more stable than boat conformation.

Reason : In boat form, many hydrogen atoms on adjacent carbon atoms have eclipsed conformation.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: A

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3. Assertion : Friedel-Crafts reaction between benzene and acetic anhydride in the presence of anhydrous $AlCl_3$ yields acetophenone and not poly substituted products.

Reason : Acetophenone formed poisons the catalyst preventing further reaction.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: C

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4. Assertion : The reaction of conc. HNO_3 and conc.H_2SO_4 on nitrobenzene gives m-dinitrobenzene.

Reason : The nitro group in benzene ring decreases the electron density in the benzene ring.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: B

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5. Assertion : Alkynes are more reactive towards nucleophilic addition reaction as compared to alkenes.

Reason : Alkynes contain two pi bonds, while alkenes have only one pi bond.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: B

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6. Assertion : Butane and 2-methylbutane are homologues.

Reason : Butane is a straight chain alkane while 2-methyl-butane is a branched chain alkane.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: B

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7. Assertion : Melting point of neopentane is higher than that of n-pentane but the boiling point of n-pentane is higher than that of

neopentane.

Reason : Melting point depends upon packing of molecules in the crystal lattice while boiling point depends upon surface area of the molecule.

A. Statement 1 is True, statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement 1 is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement 1.

C. Statement 1 is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: A

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Level Iii Linked Comprehension Type

1. 2-Phenyl propene on acidic hydration gives :

A. 2-phenyl-2-propanol

B. 2-phenyl-1-propanol

C. 3-phenyl-1-propanol

D. 1-phenyl-2-propanol

Answer: A

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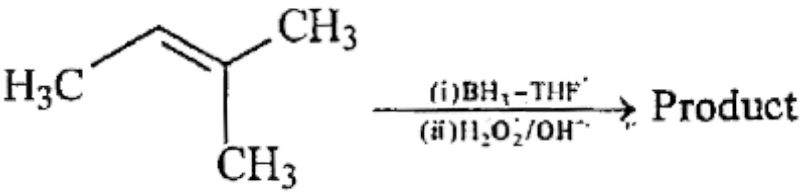
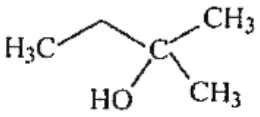
2. Acid catalysed hydration of alkene gives alcohol. In this reaction addition of water takes place according to Markownikoff's rule. Since intermediate carbocation is formed in this reaction, rearrangement of carbocation takes place. In oxymercuration-demercuration reaction hydration of alkene takes place according to Markownikoff's rule. Oxymercuration demercuration is a better process than the catalytic hydration of alkene because in oxymercuration-demercuration, no rearrangement is possible. In hydroboration oxidation, hydration of alkene takes place as if it is according to anti-Markownikoff's addition. In

hydroboration oxidation reaction rearrangement is not possible. Both in oxymercuration-demercuration and hydroboration oxidation intermediate carbocation are not formed.

The product formed in the following reaction is



A.



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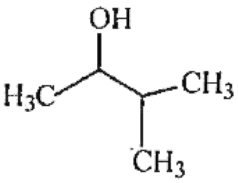
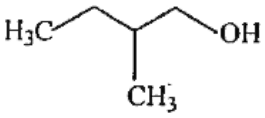
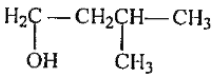


C.



D.



Answer: B

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3. Acid catalysed hydration of alkene gives alcohol. In this reaction addition of water takes place according to Markownikoff's rule. Since intermediate carbocation is formed in this reaction, rearrangement of carbocation takes place. In oxymercuration-demercuration reaction hydration of alkene takes place according to Markownikoff's rule. Oxymercuration demercuration is a better process than the catalytic hydration of alkene because in oxymercuration-demercuration, no rearrangement is possible. In hydroboration oxidation, hydration of alkene takes place as if it is according to anti-Markownikoff's addition. In hydroboration oxidation reaction rearrangement is not possible. Both in oxymercuration-demercuration and hydroboration oxidation intermediate carbocation are not formed.

$CH_3 - C = C - H \xrightarrow[(ii)\, H_2O_2 / OH^-]{(i)\, B_2H_6} A.$ A is : $CH_3 - CH_2 - CHO$,

$H_3C - \underset{\underset{O}{||}}{C} - CH_3, CH_3 - CHO, CH_3 - CH_2 - CH_2 - OH$

A. $CH_3 - CH_2 - CHO$

B. $H_3C - \underset{\underset{O}{||}}{C} - CH_3$

C. $CH_3 - CHO$

D. $CH_3 - CH_2 - CH_2 - OH$

Answer: A

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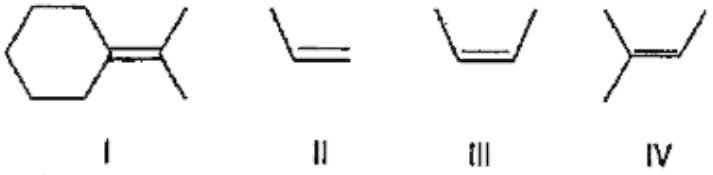
4. Alkenes on catalytic hydrogenation give alkanes. The reactions are exothermic. The heat of hydrogenation is a measure of stability of alkene. Lesser the heat of hydrogenation more stable the alkene.

The relative rate of catalytic hydrogenation of the following alkenes is



A. $II > III > IV > I$

B. $I > IV > III > II$

C. $II > IV > I > III$

D. $III > IV > I > II$

Answer: A

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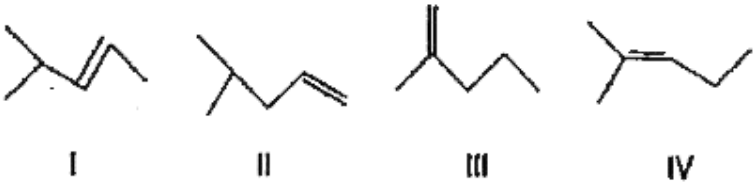
5. Alkenes on catalytic hydrogenation give alkanes. The reactions are exothermic. The heat of hydrogenation is a measure of stability of alkene. Lesser the heat of hydrogenation more stable the alkene.

The correct order of heat of hydrogenation is



A. $IV > III > I > II$

B. $II > I > III > IV$

C. $IV > III > II > I$

D. $II > III > I > IV$

Answer: B

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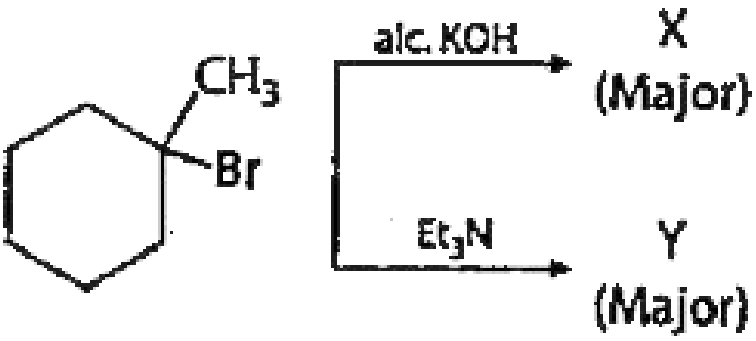
6. Alkenes on catalytic hydrogenation give alkanes. The reactions are exothermic. The heat of hydrogenation is a measure of stability of alkene. Lesser the heat of hydrogenation more stable the alkene.



. Which of the following statement is true ?

A. The heat of hydrogenation of X is more than Y

B. The heat of hydrogenation of Y is more than X

C. Both X and Y has the same heat of hydrogenation

D. Both X and Y have same reactivity towards catalytic hydrogenation

Answer: B

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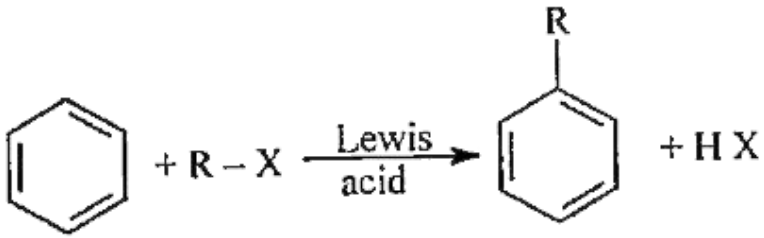
7. The reaction given below is an example of Friedel-Craft alkylation reaction.



What is electrophile in given reaction?

A. X^+

B. R^+

C. $(\text{Lewis acid X})^+$

D. none of the above

Answer: B

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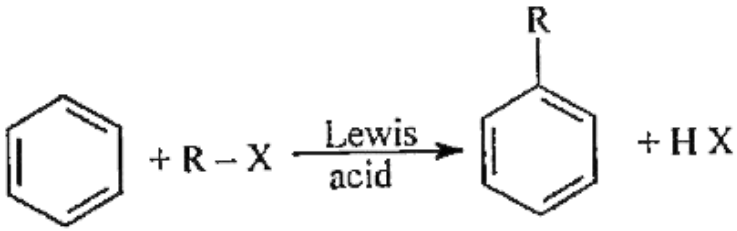
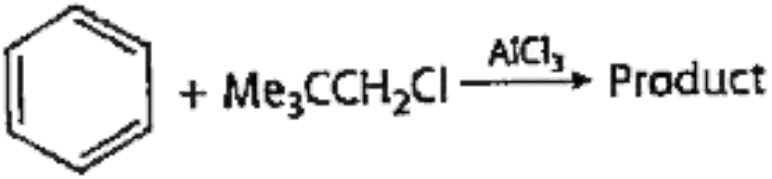
8. The reaction given below is an example of Friedel-Craft alkylation reaction.

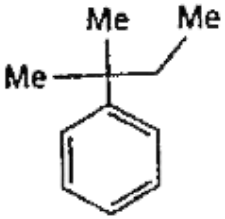


In number of cases of Friedel-Crafts alkylation, the final product is found to contain a rearranged alkyl group. Generally with stronger Lewis acid product is rearranged due to enough polarization of complex while with weak lewis acid no such effect is observed. Temperature also favours rearranged product.

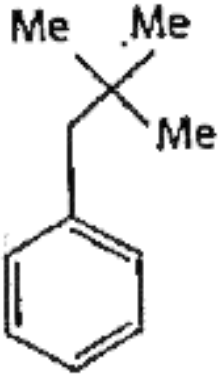


. Product is

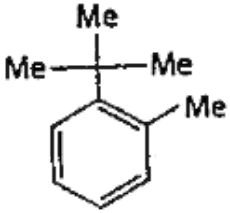
A.



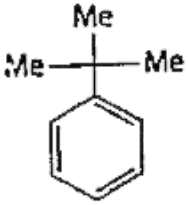
B.



C.



D.



Answer: A

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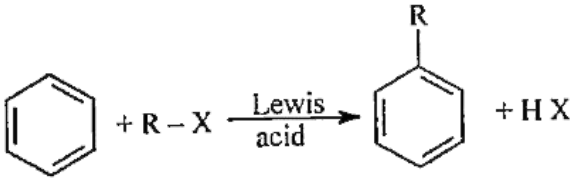
9. The reaction given below is an example of Friedel-Craft alkylation reaction.



In number of cases of Friedel-Crafts alkylation, the final product is found to contain a rearranged alkyl group. Generally with stronger Lewis acid product is rearranged due to enough polarization of complex while with weak lewis acid no such effect is observed. Temperature also favours rearranged product.

If we take $FeCl_3$ in place of $AICI_3$ in the above reaction, the product is

A. only (A)

B. Only (B)

C. (A) and (B) both can be possible

D. Not given

Answer: A

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