CHEMISTRY

FOR IIT JEE ASPIRANTS OF CLASS 11 FOR CHEMISTRY

HYDROCARBONS

Problem

1. Write IUPAC names of the following compounds :

(i) $(CH_3)_3CCH_2C(CH_3)_3$

(ii) $(CH_3)_2C(C_2H_5)_2$

(iii) tetra -tert-butylmethane

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2. Write structures for each of the following compounds. Why are the given names incorrect? Write correct IUPAC names.

(i) 2-Ethylpentane

(ii) 5-Ethyl – 3-methylheptane

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3. Write structures and IUPAC names of different structural isomer of alkenes corresponding to C_5H_{10}

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4. Draw cis and trans isomers of the following compounds. Also write their IUPAC names :

(i) CHCl = CHCl

(ii) $C_2H_5CCH_3 = CCH_3C_2H_5$

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5. Draw cis and trans isomers of the following compounds. Also write their IUPAC names :

(i) CHCl = CHCl

(ii) $C_2H_5CCH_3 = CCH_3C_2H_5$

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6. Which of the following compounds will show cis-trans isomerism?

(i) $(CH_3)_2C = CH - C_2H_5$

(ii) $CH_2 = CBr_2$

(iii) $C_6H_5CH = CH - CH_3$

$CH_3CH = CClCH_3$

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7. Write structures of different isomers corresponding to the 5th member of alkyne series. Also write IUPAC names of all the isomers. What type of isomerism is exhibited by different pairs of isomers?

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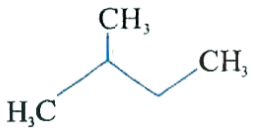
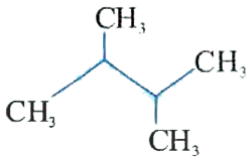
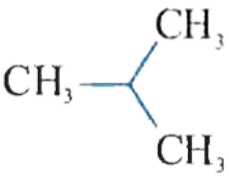
Example

1. Which of the following alkane can be obtained in good yield by the Wurtz reaction?

A. 

B. 

C. $CH_3 - CH_2 - CH_3$

D. 

Answer: B

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2. A sample of 450 mg of unknown alcohol is added to CH_3MgBr when 168 of CH_4 at STP is obtained the unknown alcohol is

A. Methanol

B. Ethanol

C. Propan -1- ol

D. Butan -1- ol

Answer: C

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3. The main product produced in the dehydrohalogenation of 2-bromo-3,3-dimethylbutane is:

A. 3, 3 - dimethyl but -1- ene

B. 2, 3- dimethylbt -1- ene

C. 2, 3- dimethyl but -2- ene

D. 4 - methylpent -2- ene

Answer: C

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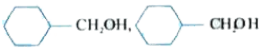
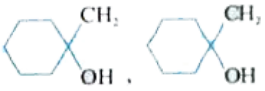
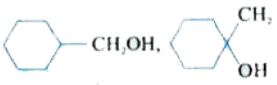
4.

$$B \xrightarrow[\text{ii) } H_2O_2/OH]{\text{i) } BH_3/THF}$$

A and Bare respectively

A. 

B. 

C. 

D. 

Answer: D

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5. When propyne is treated with aqueous H_2SO_4 in presence of $HgSO_4$, the major product is

A. Propanol

B. Propyl hydrogen sulphate

C. Acetone

D. Propanal

Answer: C

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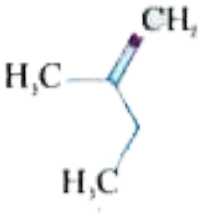
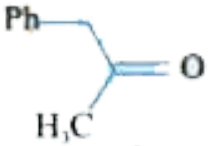
6. In the reaction $Ph - C \equiv C - CH_3 \xrightarrow[HgSO_4]{H_3O^+} A$, A is



(2)



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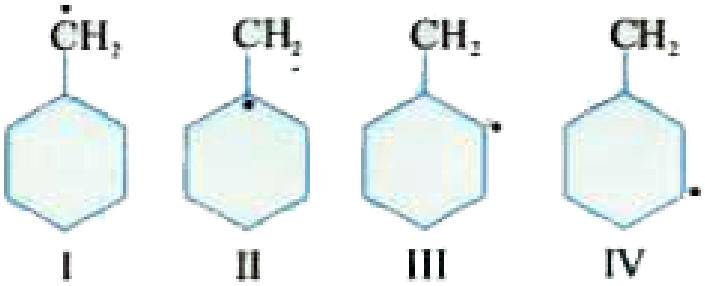
7. Which of the following is correct order of stability of given radicals?



A. $II > IV > III > I$

B. $I > III > IV > II$

C. $II > III > IV > I$

D. $IV > III > II > I$

Answer:

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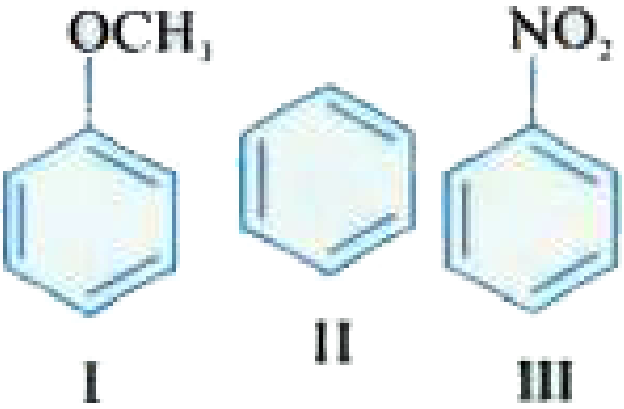
8. Among the following compounds (I - III), the correct order of reaction with electrophile is



A. $II > III > I$

B. $III < I < II$

C. $I > II > III$

D. $I > II > III$

Answer:

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Evaluate Yourself 1

1. A hydrocarbon with formula C_8H_{18} gives one monochloro derivative. The hydrocarbon can be:

A. n - octane

B. 2 - methylheptane

C. 2, 2, 4- trimethyl pentane

D. 2, 2, 3, 3, - tetramethyl butane.

Answer: D

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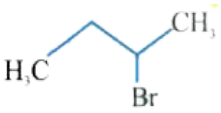
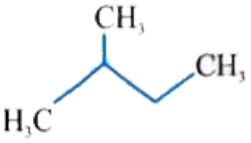
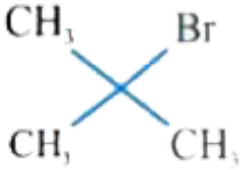
2. The major product obtained when - Butane is treated with bromine in the presence of light is

A. $CH_3 - CH_2 - CH_2 - CH_2 - Br$

B. 

C. 

D. 

Answer: B

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Evaluate Yourself 2

1. The additionof HBr to which of the following alkene is fastest?

A. $CH_2 = CH_2$

B. $CH_3 - CH = CH - CH_3$

C. $(CH_3)_2C = CH_2$

D. $CH_3 - CH = CH_2$

Answer: C

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2. Which of the following Beayer's reagent.

A. Alkaline permanganate solution

B. Acidicied permanganate solution

C. Neutral permanganate solution

D. Aqueous bromine solution

Answer: A

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Evaluate Yourself 3

1. Which of the following reacts with ammonical $AgNO_3$ solution.

A. Ethyne

B. Ethylene

C. But -2- yne

D. Ethane

Answer: A

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2. 2 - Butyne which treated with lithium in presence of liquid ammonia gives

A. cis -2- butene

B. trans -2- butene

C. n - butane

D. 1 -butyne

Answer: B

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Evaluate Yourself 4

1. $(CH_3)_2CHBr \xrightarrow[(2)\,CuI\,,\,(3)\,(CH_3)_2CHCH_2Br]{(1)\,Li} A$. This is Corey - House method of synthesis of A which is :

A. $(CH_3)_2CHCH_2CH(CH_3)_2$

B. $(CH_3)_2CHCH_2CH_2CH_3$

C. $(CH_3)_2CHCH_2CH_2CH_2CH_3$

D. None of correct

Answer: A

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2. $RCH=CH_2 \xrightarrow{BH_3/THF} A \xrightarrow{H_2O_2/OH^-} B \xrightarrow{c} RCH_2CH_3$ In this sequence of reaction A, B and C are :

A. $\underset{(RCH_2CH_2)_3,}{\text{A}} \quad \underset{RCH_2CH_2OH,}{\text{B}} \quad \underset{HI}{\text{C}}$

B. $(RCH_2CH_2)B, R\underset{OH}{\underset{|}{C}}HCH_3HI$

C. $\left(R-\underset{CH_3}{\underset{|}{C}}H-\right)B, \quad R\underset{OH}{\underset{|}{C}}HCH_3, HI$

D. None of these

Answer: A

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3. Methane gas cannot be prepared by

A. Kolbe electrolysis

B. Wurtz reaction

C. Frankland reaction

D. All of these

Answer: D

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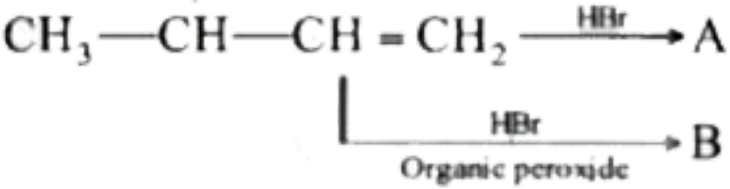

4. A & B

(major) re respectively.

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

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

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

D. $CH_3 - \overset{\overset{CH_3}{|}}{CH} - \underset{\underset{Br}{|}}{CH} - CH_3, CH_3 - \overset{\overset{CH_3}{|}}{CH} - CH_2 - CH_2 - Br$

Answer: D

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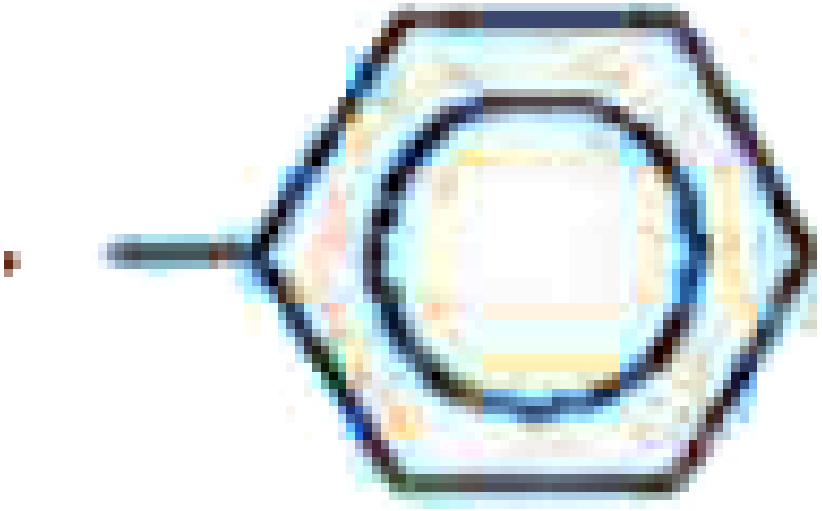
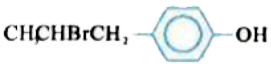
Evaluate Yourself 5

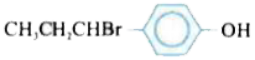
1. The reaction of $CH_3CH = CH -$



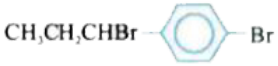
with HBr

gives :

A. 

B. 

C. 

D. 

Answer: B

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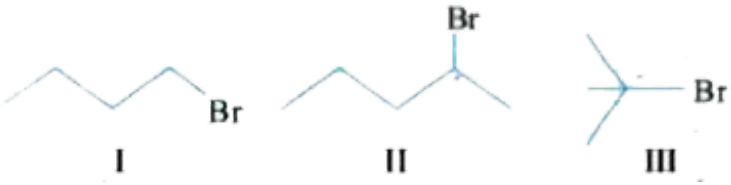
2. Ease of dehydrobromination of the following in increasing order is



A. $I < II < III$

B. $III < II < I$

C. $I < II < III$

D. $III < I < II$

Answer: A

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3. $B \xrightarrow{Lindlar} R - C \equiv C - R \xrightarrow{Na/liq.NH_3} A.$

A and B are geometrica isomers $(R - CH = CH - R)$

A. A is cis, B is trans

B. A is trans, B is cis

C. A and B both are cis

D. A and B both are trans

Answer: B

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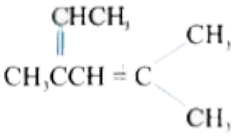
4. Alkene $\Lambda \xrightarrow{O/H_2O} CH_3\overset{\overset{O}{||}}{C}CH_3 + CHCHO + CH_3 - \underset{\underset{O}{||}}{C} - \underset{\underset{O}{||}}{C} - CHO$

A can be :

A. 

B. $CH_3\overset{\overset{C(CH_3)_2}{||}}{C}CH = CHCH_3$

C. Both are correct

D. None is correct

Answer: C

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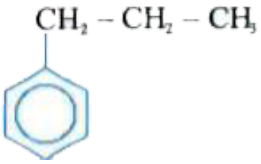
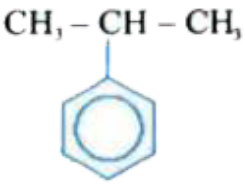
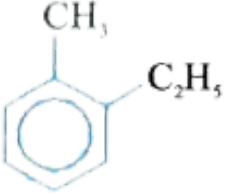
5. In the given

$+CH_5 - CH_2 - CH_2 - Cl \xrightarrow{AlCl_3}$ Product the major product will be

A. 

B. 



C.

D. Mixture of (2) & (3)

Answer: B

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Check Your Grasp

1. Complete reaction : $RMgX + ROH$?

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2. Write the all possible product of given reaction for mono helogenation

$$CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH - CH_2 + Cl_2 \rightarrow hv$$

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3. Reactivity order at HX with Alkene. HBr, HCl, HI

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4. Complete the following Reaction

$CH_3 - CH = CH_2 + HBr$

$CCl_3 - CH = CH_2 + HBr$

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5. Why Alkene is more reactivity than Alkyne for Electrophilic Addiition Reaction.

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6. Why $NaOH$ does not react with ethyne.

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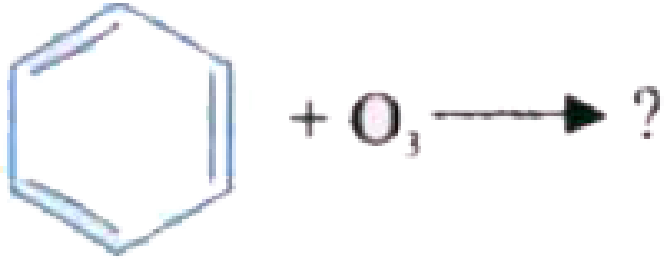
7. Complete the following reaction



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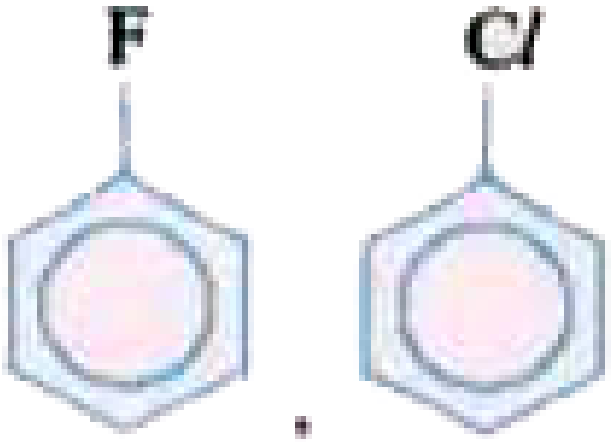
8. Arrange Reactivity order for electrophilic substitution reaction :



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C U Q Nomenclature Isomerism

1. The I.U.P.A.C. name of neopentane is

A. 2 - methyl butane

B. 2, 2 - dimethyl propane

C. 2 - methyl propane

D. 2, 2 - dimethyl butane

Answer: B

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2. The number of sigma bonds formed in ethane by the overlapping of $sp^3 - sp^3$ orbitals

A. 7

B. 5

C. 1

D. 4

Answer: C

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3. The dihedral angle between the hydrogen atoms of two methyl groups in staggered conformation of ethane is

A. 0°

B. 60°

C. 120°

D. 240°

Answer: B

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4. Energy barrier between staggered and eclipsed form in ethane is

A. 0.6 kcal/mole

B. 2.9 kcal/mole

C. 12 kcal/mole

D. 14 cal/mole

Answer: B

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5. When sodium acetate is heated with sodalime the reaction is called.

A. Dehydration

B. Decarboxylation

C. Dehydrogenation

D. Dehydrohalogenation

Answer: B

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6. The solvent used in Wurtz reaction is

A. $C_2H_5OH_{(aq)}$

B. CH_3COOH

C. H_2O

D. $C_2H_5OC_2H_{5\,(\mathrm{dry})}$

Answer: D

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C U Q Properties

1. Isomerisation in alkane may be brought about by using-

A. Al_2O_3

B. Fe_2O_3

C. Anh. $AlCl_3 / HCl$ at $200^\circ C$

D. $Conc.\ H_2SO_4$

Answer: C

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2. Conversion of high molecular weight hydrocarbons into low molecular weight hydrocarbons in the absence of air is known as

A. Polymerisation

B. Hydrolysis

C. Pyrolysis

D. Isomerisation

Answer: C

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3. Arrange the following in decreasing order of their boiling points.

(A). N-butane

(B). 2-methylbutane

(C). N-pentane

(D). 2,2-dimethylpropane

A. $i > ii > iii > iv$

B. $ii > iii > iv > i$

C. $iv > iii > ii > i$

D. $iii > ii > iv > i$

Answer: D

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4. 2-methyl propane on oxidation with $KMnO_4$ gives

A. 2 - methyl propan -2- ol

B. 2 - methyl propan -1- ol

C. butane

D. butanol - 1

Answer: A

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5. In aromatisation of n-hexane, the catalyst used is

A. Cr_2O_3

B. V_2O_5

C. Mo_2O_3

D. All

Answer: D

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6. Which reagent is suitable for the preparation of formaldehyde from Methane

A. Mo_2O_3 / D

B. $Cu / 523K$

C. $(CH_3COO)_2Mn$

D. All the above

Answer: A

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7. Which of the following Halogenation of alkane is reversible reaction.

A. Fluorination

B. Chlorination

C. Bromination

D. Iodination

Answer: D

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8. Preparation of oil gas or petrol gas from kerosene oil or petrol involves the principle of

A. Isomerisation

B. Aromatisation

C. Pyrolysis

D. All the above

Answer: C

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9. The negative part of the addendum adds on to the carbon atom joined to the least number of hydrogen atoms. This statemet is called.

A. Baeyer's strain theory

B. Markovnikov's rule

C. Newmann theory

D. Peroxide affect

Answer: B

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10. The peroxide effect involves

A. Ionic mechanism

B. Free - radical mechanism

C. Heterolytic fission of double bond

D. All the above

Answer: B

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11. Anti markovnikov's addition of BHr is not observed in

A. Propene cant decolorise dilute $KMnO_4$ solution

B. Butene - 1

C. Butene - 2

D. Pentene - 2

Answer: C

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12. The olefin which on ozonolysis gives CH_3CH_2CHO and CH_3CHO is-

A. 1 - butene

B. 2 - butene, HCl

C. 1 - pentene

D. 2 - pentene

Answer: D

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13. Baeyer's reagent oxidises ethylene to

A. Ethylene chlorohydrin

B. Ethyl alcohol

C. $CO_2 \& H_2O$

D. Ethane - 1, 2 - diol

Answer: D

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14. On reductive ozonolysis, ethylene gives

A. Aldehyde

B. Ketone

C. Carboxylic acid

D. Ether

Answer: A

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15. 1-pentyne and 2-pentyne can be distinguished by

A. Silver miror test

B. Iodoform test

C. Addition of H_2

D. Baeyers test

Answer: A

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16. Cold and dil. Alk. $KMnO_4$ will oxidise acetylene to

A. Ethylene glycol

B. Ethyl alcohol

C. Oxalic acid

D. Acetic acid

Answer: C

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17. $X + 2KOH \xrightarrow{\text{alcohol}} H - C \equiv C - H$ here 'X' is

A. 1, 1 - Dibromoethane

B. 1, 2 - Dibromoethane

C. Both (1) and (2)

D. 1, 1, 2, 2, - Tetrabromoethane

Answer: C

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18. Acetylene gives white precipitate with ammonical silver nitrate but ethylene cannot give because

A. Acetylenepossess sp^2 carbon

B. Acetylene posses acidic hydrogen

C. Acetylene possess low electronegative carbon

D. Acetylene posses $-C \equiv C -$ triple bond

Answer: B

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19. Which of the following possess acidic hydrogen

A. C_2H_6

B. C_2H_4

C. C_2H_2

D. CH_4

Answer: C

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20. The reagent used for obtaining trans alkene from alkyl subsituted acetylene with hydrogen is

A. Na in liq. NH_3

B. $LiAlH_4$

C. $Zn + HCl$

D. H_2 in presence of Ni

Answer: A

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21. Hydrocarbon which gives oxyacetylene flame

A. ethane

B. ethene

C. ethyne

D. ethanal

Answer: C

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22. Aromatic compounds give smoky flame because

A. Hydrogen percentage is more

B. Carbon percentage is more

C. Delocalisation

D. Saturation

Answer: B

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23. Bond length of C-C in benzene

A. $1.34A^{\circ}$

B. $1.39A^{\cdot\circ}$

C. $1.54A^{\circ}$

D. $1.20A^{\circ}$

Answer: B

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24. Benzene is an

A. [8] annulene

B. [6] annulene

C. [12] annulene

D. [4] annulene

Answer: B

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25. The dipolemoment of benzene is

A. Zero

B. Less than p - dichloro benzene

C. Greater than p - dichloro benzene

D. Equal to that of chloro benzene

Answer: A

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26. The increase in stability and decrease in energy of aromatic compounds is due to

A. Localisationof pi - electrons

B. Delocalisation of sigma - electrons

C. Localisation of sigma - electrons

D. Delocalisation of pi - electrons

Answer: D

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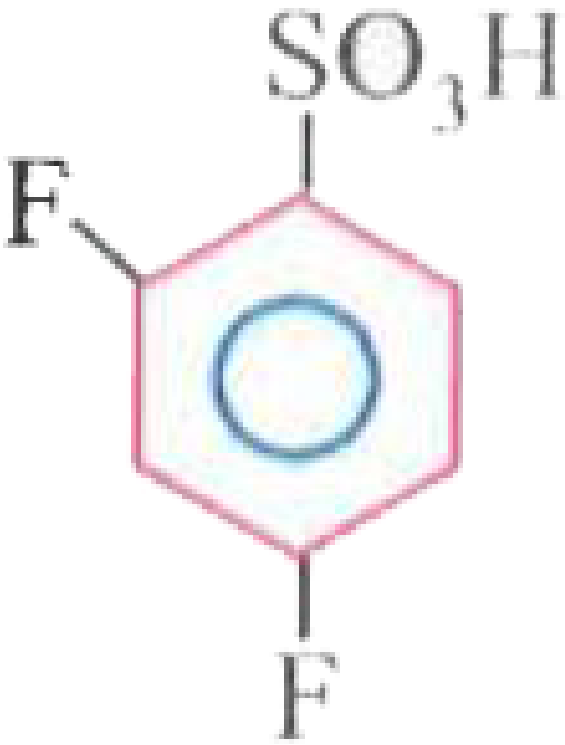
27. IUPAC name of the following compound is



A. 2, 4 - difluoro -1- sulpho benzene

B. 2, 4 - difluoro benzene sulphonic acid

C. Benzene - 2, 4 - difluoro sulphonic acid

D. All the above

Answer: B

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28. Benzene is ..... Molecule.

A. Tetrahedral

B. Planar

C. Trigonal pyramidal

D. Square planar

Answer: B

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29. The resonance energy of benzene is

A. 36 kcal/mol

B. 85.8 kJ/mole

C. 150.48 kJ/mole

D. Both 1& 3

Answer: D

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30. Shape of cyclo octatetraene is

A. Planar

B. Tetrahedral

C. Tub shape

D. Hexagonal

Answer: C

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31. In Huckel's $(4n+2)\pi$ rule for aromaticity, 'n' represents

A. Number of carbon atoms

B. Number of rings

C. Whole number

D. Fractional number (or) integer (or) zero

Answer: C

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32. What is number of electron delocalising in benzene molecule.

A. 3

B. 6

C. Zero

D. 12

Answer: B

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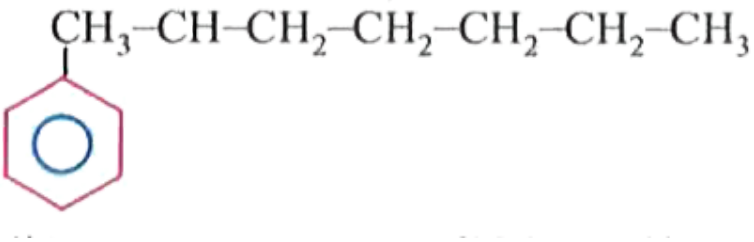
33. IUPAC name of the following compound is



A. Heptyl benzene

B. 2 - Benzyl heptane

C. 1 - Phenyl heptane

D. 1 - heptyl benzene

Answer: C

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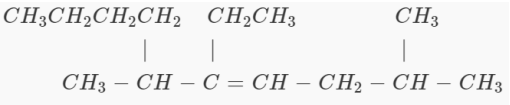
C U Q Preparations Of Alkenes

1. Write the IUPAC name



A. 5 - ethyl - 2, 6 - dimethyl dec - 4 - ene

B. 3 - ethyl - 5, 6 - dimethyl dec - 4 - ene

C. 2 - ethyl - 5, 6 - dimethyl dec - 4 - ene

D. 5 - ethyl - 2, 5 - dimethyl dec - 4 - ene

Answer: A

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2. The number of structural isomers (open chain) possible for C_5H_{10} are

A. 6

B. 4

C. 5

D. 3

Answer: C

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3. Planar molecule among the following is

A. $CH_2 = CH_2$

B. $CH_3 - CH_3$

C. $H \equiv C - CH_3$

D. Cyclohexane

Answer: A

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4. When ethanol vapours are passed over alumina heated at $350^{\circ}C$ the main product obtained is

A. C_2H_6

B. C_2H_6

C. C_2H_2

D. $C_2H_5OC_2H_5$

Answer: B

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5. Dehydrohalogenation of ethyl chloride in presence of alc. KOH produces the following

A. $HC \equiv CH + KCl + H_2O$

B. $CH_4 + KCl + H_2O$

C. $CH_2 \equiv CH_2 + KCl + H_2O$

D. $C_2H_4 + HCl$

Answer: C

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C U Q Nomenclature Methods Of Reparation

1. Polythene is obtained by the polymerization of

A. Styrene

B. A mixture of ethylene and styrene

C. Acetylene

D. Ethene

Answer: D

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2. the number of alkynes possible with molecular formula C_5H_8 is :

A. 3

B. 4

C. 5

D. 6

Answer: A

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3. The number of open chain structural isomers possible for C_4H_6

A. 6

B. 5

C. 4

D. 2

Answer: C

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4. The isomer of propyne

A. Allene

B. Propene

C. Cyclo propane

D. Propane

Answer: A

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5. The C-C bond length is shortest in

A. C_2H_6

B. C_2H_2

C. C_6H_6

D. C_2H_4

Answer: B

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6. Gem dihalides on treatment with alcoholic KOH give

A. Alkyne

B. Alkene

C. Alkane

D. Cyclo alkanes

Answer: A

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7. Which one of the following has the minimum boiling point :

A. 1 - Pentyne

B. 1 - Butyne

C. n - Butane

D. Isobutane

Answer: D

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C U Q Preparation Properties

1. Which of the following cannot form ozonide

A. Benzene

B. Ethene

C. Ethyne

D. Ethane

Answer: D

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2. Gammaxene is ..... Isomer of benzene hexa chloride

A. α

B. β

C. γ

D. δ

Answer: C

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3. The empirical formula of benzene and acetylene is/are

A. CH_2, CH

B. C_2H, CH_2

C. CH, CH

D. CH_3, CH_3

Answer: C

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4. Preparation of benzene from phenol is

A. Reduction

B. Oxidation

C. Addition

D. Dehydrogenation

Answer: A

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5. The true statement about benzene is

A. Because of unsaturation benzene easily undergoes addition reactions

B. There are two types $C-C$ bonds in benzene molecule

C. There is a cyclilc delocalisationof pi - electrons in benzene

D. Mono substitutionof benzene gives three isomeric products

Answer: C

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6. Which among the following is very strong o-p-directing groups?

A. $-Cl$

B. $-OR$

C. $-NH_2$

D. $-NHR$

Answer: D

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7. Lindane is also represented as

A. 6, 6, 6

B. BHC

C. Gammaxene

D. all of these

Answer: D

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8. The homologue of toluene is

A. Ethyl benzene

B. Methyl benzene

C. Phenol

D. Nitro benzene

Answer: A

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9. Benzen is purified by

A. Distillation

B. Fractional distillation

C. Evaporation

D. Sublimation

Answer: B

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10. Chemical name of the insecticide gammaxene is

A. DDT

B. Benzene hexa chloride

C. Chloral

D. Hexa chloro ethane

Answer: B

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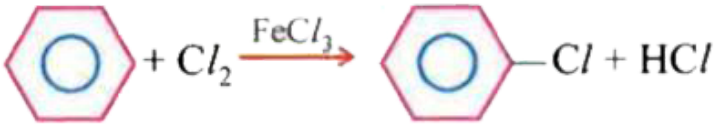
11. In the reaction



the attacking species is

A. Cl_2

B. Cl^+ in the first step

C. Cl^-

D. $FeCl_4^-$

Answer: B

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12. Which one among the following gives a dicarbonyl compound with O_3 followed by reduction with zinc and water

A. C_2H_4

B. C_6H_6

C. C_2H_2

D. Both 2 & 3

Answer: D

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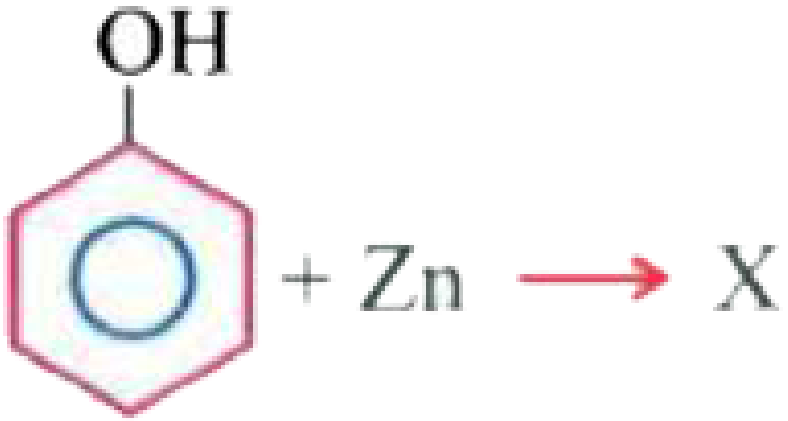

13. Here the product X is used as a

A. Insecticide

B. For welding purpose

C. For dry cleaning

D. Artificial ripening of fruits

Answer: C

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14. C_6H_6 is very good industrial solvent for

A. Oil

B. Fat

C. Rubber

D. All

Answer: D

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C U Q Directing Influence Of Functional Groups Chemical Reactivity

1. $-COOH$ group in electrophilic substitution directs the incoming groups to

A. o - position

B. p - position

C. m - position

D. o - and p - position

Answer: C

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2. All the common m-directig group make the benzene ring towards electrophilic substitution reactions

A. Deactivate

B. Activate

C. Both 1 & 2

D. Neutral

Answer: A

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3. The conversion

Can be effected using

A. Br_2 / CCl_4

B. Br_2 / H_2O

C. Br_2 / Fe

D. $Br_2 /$ benzoyl peroxide

Answer: C

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4. Nitration mixture is

A. $1:1$ of conc. HNO_3 and conc. HCl

B. $1:1$ of conc. HNO_3 and conc. H_2SO_4

C. $1:1$ of conc. HNO_2 and conc. H_2SO_3

D. $1:10$ of conc. H_2SO_4 and conc. HNO_3

Answer: B

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5. Benzene reacts with _____ to yield acetophenone

A. $CH_3COCl + AlCl_3$

B. $C_6H_3COCl + AlCl_3$

C. $R - COCl + AlCl_3$

D. $C_2H_5COCl + AlCl_3$

Answer: A

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6. Which of the following behaves as a saturated compound?

A. C_2H_4

B. C_2H_2

C. C_3H_6

D. C_6H_6

Answer: D

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C U Q Structure Aromaticity

1. Benzene is a resonance hybrid of mainly two Kekule structures. Hence

A. Hlaf the molecules correspond to one structure and half to the second structure

B. At low temperature benzene can be separated into two structures

C. Two structures make equal contribution to resonance hybride

D. An individual benzene molecule changes back and forth between two structures

Answer: C

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2. In thenitration mixture concentrated sulphuric acid is used

A. As a sulphonating agent

B. As dehydrating agent

C. For the formation of nucleophile

D. As a solvent

Answer: B

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

A. Double bonds in benzene ring are strong

B.

C.

D.

Answer: C

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4. how many monosubstituted products can be derived from benzene

A. One

B. Two

C. Three

D. Four

Answer: A

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Exercise 1 C W Alkanes Nomenclature Isomerism

1. IUPAC name of the following compound

$$CH_3 - CH_2 - \underset{\displaystyle CH_3}{\underset{|}{\mathrm{CH}}} - CH_2 - \underset{\displaystyle C_2H_5}{\underset{|}{\mathrm{CH}}} - CH_2 - CH_3$$

A. 3 - Ethyl -5-methylheptane

B. 5 - Ethyl -3-methylheptane

C. 2 - Ethyl -5-methylheptane

D. 4 - Ethyl -5-methylheptane

Answer: A

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2. The fully eclipsed conformation of n - butane is least stable due to the presence of

A. Bond opposition strain only

B. Steric strain only

C. Bond opposition strain as well as steric strain

D. No strain is present in the molecule.

Answer: C

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3. In which of the following preparation of ethane a new C-C bond is formed

A. Sabatimer -Senderson's reaction

B. Reduction of ethyl iodide

C. Decarboxylation

D. Kolbe's electrolysis

Answer: D

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4. In order to get propane gas which, of the following should be subjected to sodalime decarboxylation?

A. Sodium formate

B. Mixture of sodium acetate and sodium ethanoate

C. Sodium butyrate

D. Sodium propionate

Answer: C

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5. Identify the chain propagation of chlorination of methane

A. $\overset{*}{C}H_3 + \overset{*}{C}l \rightarrow CH_3Cl$

B. $CH_3Cl + \overset{*}{C}l \rightarrow \overset{*}{C}H_2Cl + HCl$

C. $Cl - Cl \xrightarrow[\text{hom olysis}]{h\nu} \overset{*}{C}l + \overset{*}{C}l$

D. $\overset{*}{C}l + \overset{*}{C}l \rightarrow Cl_2$

Answer: B

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6. How many products are possible for monochlorination of propane

A. 1

B. 2

C. 3

D. 4

Answer: B

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7. Which of the following compounds is not formed in the pyrolysis of Hexane

A. C_6H_{12}

B. C_3H_6

C. C_2H_4

D. C_2H_2

Answer: D

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8. What is the by product during chlorination of methane

A. Ethane

B. Methane

C. Acetylene

D. All of the above

Answer: A

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Exercise 1 C W Alkenes Preparations Of Alkenes

1. What are X and Y in the reaction

$$C_2H_4 + H_2SO_4 \xrightarrow{80^\circ C} X \xrightarrow[\Delta]{H_2\ \emptyset} Y$$

A. C_2H_6, C_2H_5OH

B. C_2H_4, C_2H_5SH

C. $C_2H_5OSO_3H, C_2H_5OH$

D. C_2H_4, C_2H_5OH

Answer: C

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2. 2-mthylpent-2-ene on ozonolysis will give

A. Only propanal

B. Propanal and ethanal

C. Propanone -2 and ethanal

D. Propanone -2 and propanal

Answer: D

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3. $Z-\text{isomer} \xleftarrow{y} 2-\text{butyne} \xrightarrow{x} E-\text{isomer}$ x,y respectively are

A. $Na/NH_{3(\text{liq})}$ and $Pd/BaSO_4 + H_2$

B. $Ni/140^\circ C$ and $Pd/BaSO_4 + H_2$

C. $Ni/140^\circ C$ and $Na/NH_{3(\text{liq})}$

D. $Pd/BaSO_4 + H_2$ and $Na/NH_{3(aq)}$

Answer: A

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4. Acidic potassium dichromate oxidises 2 - Butene to

A. Butan -2- one

B. Ethanoic acid $+CO_2$

C. Butanoic acid

D. Ethanoic acid only

Answer: D

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5. Ozonolysis reaction is useful in detecting the

A. Presenceof carbonyl functional group

B. Presenceof carboxylic functional group

C. Position of double bonds in alkenes

D. All the above

Answer: C

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Exercise 1 C W Alkynes Nomenclature Methods Of Preparation

1. Action of zinc on tetrabromoethane gives

A. $CH_3 - OH$

B. $CH \equiv CH$

C. $CH_3 - CH_3$

D. $CH_2 = CH_2$

Answer: B

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2. Which of the following carbide on hydrolysis gives Acetylene gas

A. Al_4C_3

B. Be_2C

C. Be_2C

D. CaC_2

Answer: D

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3. $CH_3 - C \equiv CH \xrightarrow[Hg^{2+}]{dil\,H_2SO_4} CH_3 - \underset{(X)}{\overset{OH}{\overset{|}{C}}} - CH_2 \leftrightarrow CH_3 - \underset{(Y)}{\overset{O}{\overset{|}{C}}} - CH_3$

By what phenomenon X converts into Y.

A. Isomerisation

B. Aromatisation

C. Tautomerism

D. Metamerism

Answer: C

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Exercise 1 C W Properties

1. The number of acidic hydrogen atoms in 1 - butyne and 2 - butyne respectively are

A. 1, 0

B. 0, 1

C. 1, 1

D. 1, 2

Answer: A

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2. Acetylene with excess of Br_2 / CCl_4 gives

A. Decolorisation, $CHBr_2 - CH_3$

B. Decolorisation, $CHBr_2 - CHBr_2$

C. redish brown colour, $CHBr_2 - CH_3$

D. redish brown colour, $CHBr_2 - CHBr_2$

Answer: B

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3. Acetylene is passed through red hot iron tubes to give

A. C_6H_6

B. C_2H_6

C. C_2H_4

D. all

Answer: A

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4. $HC \equiv CH \xrightarrow[NaNH_2]{\text{Excess}} A \xrightarrow{C_2H_5Cl} B$ find the B.

A. $C_2H_5 \equiv C - C_2H_5$

B. $HC \equiv C - C_2H_5$

C. $H_2C = CH - C_2H_5$

D. $ClHC = CHC_2H_5$

Answer: A

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5. Acetylene on ozonolysis with

$(O_3 + Zn/H_2O)$ gives

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

B. $HO - \overset{O}{\overset{||}{C}} - \overset{O}{\overset{||}{C}} - OH$

C. $\begin{matrix} \mathrm{HO} & & \mathrm{OH} \\ | & & | \\ HC_2 & - & CH_2 \end{matrix}$

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

Answer: A

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Exercise 1 C W Benzene Structure Aromaticity

1. Identify the Aromatic compound in the following

A. Tetra hydro furan

B. Pyridine

C. Cyclopenta dienyl anion

D. both 2 & 3

Answer: D

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2. The ratio of the number of hybrid and pure orbitals in C_6H_6 is

A. $3:2$

B. $2:3$

C. $1:1$

D. $4:3$

Answer: A

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Exercise 1 C W Preparation Properties

1. Which fo the following does not decolourise the Baeyer's reagent.

A. C_2H_4

B. C_6H_6

C. C_2H_2

D. All

Answer: B

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2. Hydrolysis of benzene sulphonic acid with super heated steam gives

A. Phenol, chlorobenzene

B. Benzene

C. Sulphuric acid

D. Both 2 & 3

Answer: D

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3. Benzene on treating with a mixture of conc. HNO_3 and H_2SO_4 at $100^\circ C$ gives

A. Nitrobenzene

B. m - dinitrobenzene

C. o - dinitrobenzene

D. p - dinitrobenzene

Answer: B

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4. The function of anhydrous $AlCl_3$ in friedel-Crafts' reaction is to

A. Absorb water

B. Absorb HCl

C. Produce electrophile

D. Produce nucleophile

Answer: C

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5. Addition of Cl_2 or Br_2 (in the presence of sunlight) to the benzene follow

A. Free radical addition

B. Electrophilic addition

C. Nucleophilic addition

D. Electrophilic substitution

Answer: A

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Exercise 1 C W Directing Influence Of Functional Groups Chemical Reactivity

1. A group which deactivates the benzene ring towards electrophilic substitution but directs the incoming group towards o- and p- position is

A. $-NH_2$

B. $-Cl$

C. $-NO_2$

D. $-C_2H_5$

Answer: B

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2. Which of the following is most powerful meta directing group.

A. $-NO_2$

B. $-SO_3H$

C. $-CHO$

D. $-COOH$

Answer: A

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Exercise 1 C W Carcinogenicity

1. Carcinogenic pollutants are formed on incomplete combustion of

A. Tobaco

B. Coal

C. Pertroleum

D. All the above

Answer: D

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2. Benzene and polynuclear hydrocarbons containing more than two benzene rings fused together are

A. Toxic

B. Posses carcinogenic property

C. Causes cancer

D. All the above

Answer: D

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3. Among the followig, carcinogenic pollutant is

A. 1, 2, - benzpyrene

B. 1, 2, 5, 6 - Bibenzanthracene

C. 3 - methyl chlolanthrene

D. All the above

Answer: D

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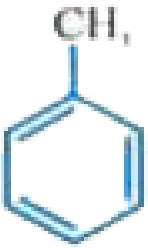
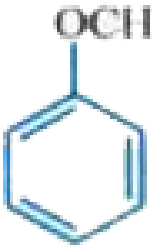
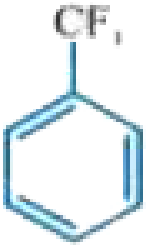
Exercise 1 C W Electrophilic Aromatic Substitution Reaction

1. Among the following compounds the decreasing order of reactivity towards electrophilic substitution is

(I) 

(II) 

(III) 

(IV) 

A. $II > I > IIIIV$

B. $III > I > II > IV$

C. $IV > I > II > III$

D. $I > II > III > IV$

Answer: B

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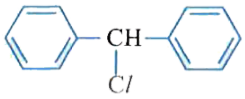
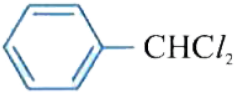
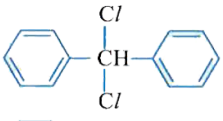
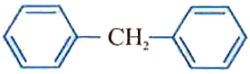
2. Which of the following structures correspond to the product expected, when excess of C_6H_6 reacts with CH_2Cl_2 in presence of anhydrous $AlCl_3$?

A. 

B. 

C. 

D. 

Answer: D

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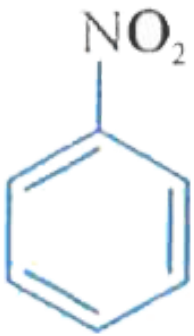
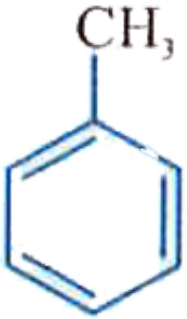
3. Which of the following compounds react slower than benzene in electrophilic substitution?

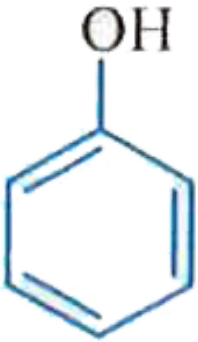
A.



B.



C.



D.

Answer: A

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4. What is the end product which is obtained on the nitration on toluene?

A. o - Nitrotoluene

B. p - Nitrotoluene

C. 2, 4 - Dinitrotoluene

D. 2, 4, 6 - Trinitro toluene

Answer: D

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5. In Friedel Crafts synthesis of $C_6H_5 - CH_3$, reactants in addition of anhydrous aluminium chloride are :

A. $C_6H_6 + CH_4$

B. $C_6H_6 + CH_3 - Cl$

C. $C_6H_5Cl + CH_3 - Cl$

D. $C_6H_5 - Cl + CH_4$

Answer: B

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Exercise 1 C W Oxidation And Reduction

1. By which of the following reagent butanoic acid can be converted into butane :

A. $HI / P / \Delta$

B. $NaOH / CaO$

C. CH_3MhBr

D. All of these

Answer: A

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2. Which among the following reagents gives oxidation with alkene?

A. $KMnO_4 / \overset{\Theta}{O}H / \Delta$

B. O_3

C. C_6H_5COOOH

D. All of these

Answer: D

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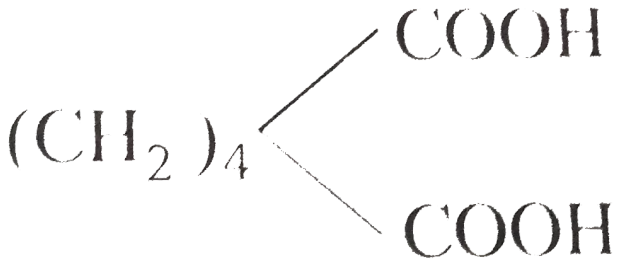
3. Unknown compound (A) on oxidation with hot basic $KMnO_4$ gives only one compound whose structure is given below,

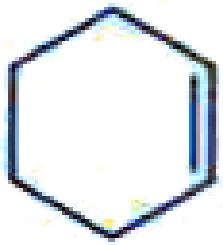


Compound (A) will be:

A. $CH_3 - C \equiv C - (CH_2)_4 - C \equiv C - CH_3$

B. $CH_3 - CH = CH - (CH_2)_4 - CH = CH_2$

C. $CH_3 - CH = CH - (CH_2)_4 - CH = CH - CH_3$

D. 

Answer: D

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4. Compound (A) on oxidation with hot $KMnO_4/\overset{\Theta}{O}H$ gives two compound

$CH_3 - \underset{CH_3}{\underset{|}{CH}} - COOH$ and $CH_3 - \overset{O}{\overset{||}{C}} - CH_2 - CH_2 - CH_3$

compound (A) will have the structures :

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

B. $CH_3 - \underset{CH_3}{\underset{|}{CH}} = \underset{CH_3}{\underset{|}{C}} - CH_2 - CH_2CH_3$

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

D. $CH_{\#} - \underset{CH_3}{\underset{|}{CH}} - C \equiv C - \underset{CH_3}{\underset{|}{CH}}CH_3$

Answer: B

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5. O-xylene on ozonolysis will give:

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

B. $CH_3 - \overset{\overset{O}{||}}{C} - \overset{\overset{O}{||}}{C} - CH_3$ and $CH_3 - \overset{\overset{O}{||}}{C} - CHO$

C. $CH_3 - \overset{\overset{O}{||}}{C} - \overset{\overset{O}{||}}{C} - CH_3$ and $CHO - CHO$

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

Answer: D

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6. Product of the given reaction

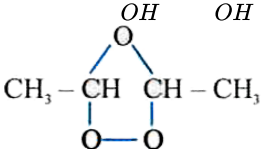
$$CH_3 - CH = CH - Ch \xrightarrow[-78^\circ C]{O_3 / CH_2Cl_2}$$

will be :

A. $CH_3 - CHO$

B. $CH_3 - COOH$

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

D. 

Answer: D

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7. In the reaction :

$$CH_3 - C \equiv C - H \xrightarrow{NaNH_2/NH_3(l)} (A) \xrightarrow{CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{Br}{|}}{C}} - CH_3} (B),$$

The product (B) is :

A. Only $CH_3 - C \equiv \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - C - CH_3$

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

C.

$1:1$ mixture of $CH_3-C\equiv \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-C-CH_3$ and $CH_3-\underset{\underset{CH_3}{|}}{C}=CI$

D. $1:1$ mixture of $CH_3-\underset{\underset{CH_3}{|}}{C}=CH_2$ and $CH_3-C\equiv C-H$

Answer: C

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8. In the reaction :

$$CH_3-C\equiv C-H \xrightarrow{(i)\,NaNH_2/NH_3\,(I)} (A) \xrightarrow{CH_3-CH_2-CH_2-Br} (B)$$

the product (B) is :

A. $H_3-C\equiv C-CH_2-CH_2-CH_3$

B. $CH_3-CH=CH_2$

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

D. $CH_3-CH=C=CH-CH_2-CH_3$

Answer: A

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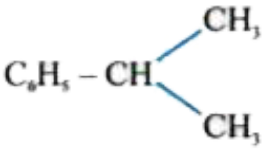
9. Which of the following compound will not give benzoic acid on oxidation with $KMnO_4 / \overset{\Theta}{O}H / \Delta$:

A. $C_6H_5 - CH_3$

B. $C_6H_5 - \overset{CH_3}{\underset{CH_3}{\overset{|}{\underset{|}{C}}}} - CH_3$

C. 

D. $C_6H_5 - CH_2 - COOH$

Answer: B

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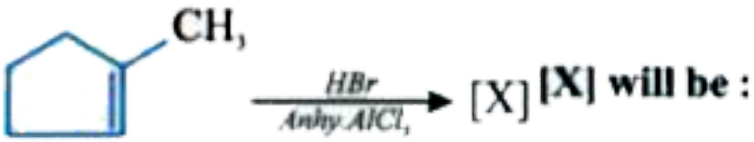
Exercise 1 C W Addition Reaction

1. In the reaction sequence



[X] will be :

A. 1 - Bromo -2- methylcyclopentane

B. 1 - Bromo -1- methylcyclopentane

C. 1 - Bromo -5- methylcyclopentane

D. 5 - Bromo -1- methylcyclopentane

Answer: B

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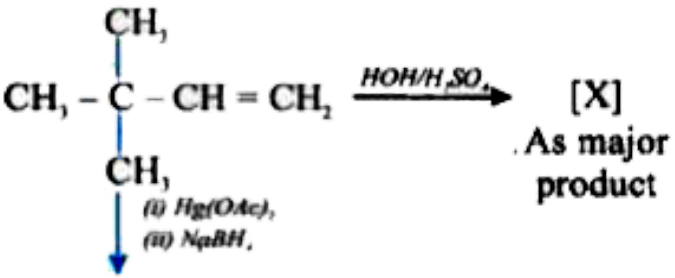
2. Consider the following reactions :



[Y] as major product. [X] & [Y] respectively be :

A. 2, 3 - Dimethyl -2- butanol and 3, 3 - Dimethyl -2- butanol

B. 2, 3 - Dimethyl -2- butanol and 2, 3 - Dimethyl -2- butanol

C. 3, 3 - Dimethyl -2- butanol and 3, 3 - Dimethyl -2- butanol

D. 3, 3 - Dimethyl -2- butanol and 3, 3 - Dimethyl -2- butanol

Answer: A

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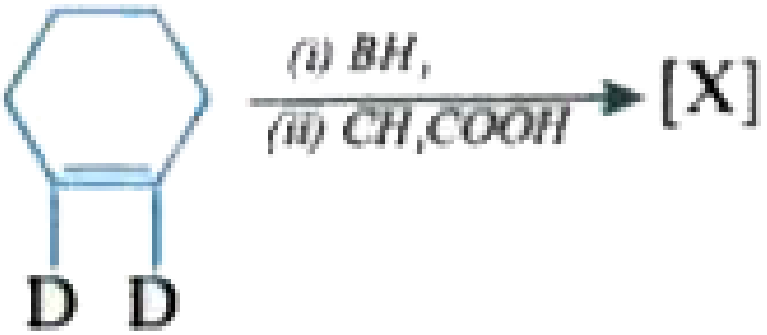
3. In the given reaction



[X] will be :

A. 

B. 

C. both

D. None

Answer: A

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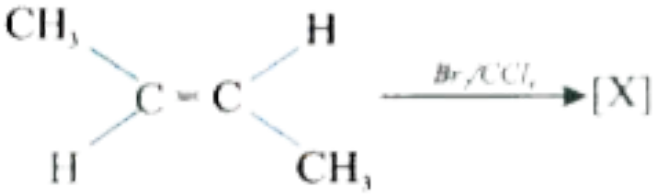
4. In the given reaction



[X] will be :

A. Meso - 2, 3 -dibromobutane

B. Racemic mixture of 2, 3- dibromobutane

C. Meso as well racemic mixture

D. 1 - Bromo -2- butene

Answer: A

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5. Bond length of ethane (I), ethene (II), acetylene (III) and benzene (IV) follows the order

A. 1 gt 2 gt 3 gt 4

B. 1 gt 2 gt 4 gt 3

C. 1 gt 4 gt 2 gt 3

D. 3 gt 4 gt 2 gt 1

Answer: C

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Exercise 1 C W Halogenation And Grignard Reagent

1. Which will form hydrocarbon with Grignard reagent?

A. CH_3CHO

B. CH_3CH_2OH

C. CH_3COCH_3

D. CH_3COOCH_3

Answer: B

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2. An alkane (mol. Wt. 72) forms only one monochlorinated product. Its formula is

A. $(CH_3)_4C$

B. $CH_3(CH_2)_3CH_3$

C. $(CH_3)_2CHCH_2CH_3$

D. 

Answer: A

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Exercise 1 C W Miscellaneous

1. Soda lime is used extensively in decarboxylation reaction to obtain alkanes. Soda lime is

A. $NaOH$

B. $NaOH$ and CaO

C. CaO

D. Na_2CO_3

Answer: B

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2. The compound with the highest boiling point is

A. n - Hexane

B. n - Pentane

C. 2, 2 - Dimethylpropane

D. 2 - Methylbutane

Answer: A

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3. how many π electrons are there in the following species ?

A. 2

B. 4

C. 6

D. 8

Answer: C

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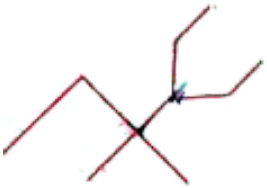
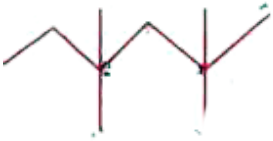
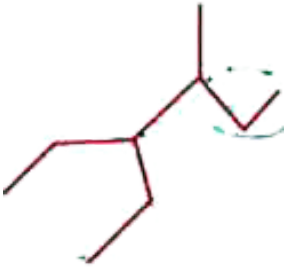
Exercise 1 H W Alkanes Nomenclature Isomerism

1. 4-ethyl-3,3 di methyl hexane is

A. 

B. 

C. 

D. 

Answer: A

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2. Select the correct statement

A. Eclipsed and staggered ethanes give different products on reaction with chlorine in presence of light

B. The conformational isomers can be isolated at room temperature

C. Torsional strain is minimum in ethane at dihedral angles $60^\circ, 180^\circ$ and 300°

D. Steric strain is minimum in gauche form of n - butane

Answer: C

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3. The number of possible theoretical conformations of ethane is

A. Two

B. Three

C. Four

D. Infinite

Answer: D

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4. The spatial arrangement of atoms that characterises a particular stereoisomers is called.

A. Configuration

B. Conformation

C. Tautomer

D. Metamer

Answer: A

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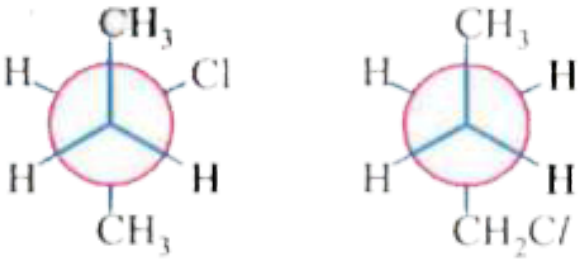
5. The pair of structures given below represent



A. Enantiomers

B. Diastereomers

C. Structural iomsers

D. Two molecules of the same compound

Answer: C

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6. Wet ether is not used as a solvent in Wurtz reaction because the water present in it,

A. Hydrolyses $RX \rightarrow ROH$

B. Reduces $RX \rightarrow RH$

C. Oxidise $RX \rightarrow RH$

D. Reacts with $R - R$

Answer: A

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7. Both methane and ethane may be obtained by suitable one step reaction from

A. Ethyl iodide

B. Methyl iodide

C. Formaldehyde

D. Acetaldehyde

Answer: B

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8. What is the reactivity order of halogens towards substitution in alkanes?

A. $F_2 < Cl_2 < Br_2 < I_2$

B. $F_2 = Cl_2 = Br_2 = I_2$

C. $F_2 < Cl_2 < Br_2 = I_2$

D. $F_2 > Cl_2 > Br_2 > I_2$

Answer: D

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9. The radical halogenation of 2 - methyl propane gives two products $(CH_3)_2CHCH_2X_{(\text{minor})}$ and $(CH_3)_3CX_{(\text{major})}$. Chlorination gives larger amount of the minor product than the bromination because

A. Bromine is more reactive than chlorine and is able to attack the less reactive $3^\circ C - H$

B. Bromine atoms are less reactive (more selective) than chlorine and preferentially attack the weaker $3^\circ C - H$ bond.

C. The methyl groups are more hindered to attack by the larger bromine atom

D. Bromination is reversible and more stable $3^{\circ}-$ alkyl bromide is formed exclusively.

Answer: B

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10. Which of the following compounds are not formed in the catalytic cracking of octane

A. Pentane

B. Butene

C. Propene

D. Nonane

Answer: D

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11. The order of reactivity of hydrogens in isopentane is:

A. $1^\circ = 2^\circ > 3^\circ$

B. $1^\circ > 2^\circ > 3^\circ$

C. $3^\circ > 1^\circ > 2^\circ$

D. $3^\circ > 2^\circ > 1^\circ$

Answer: D

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Exercise 1 H W Alkenes Preparations Of Alkenes Properties

1. In the following reaction, A and B respectively are,

$A \xrightarrow{HBr} C_2H_5Br \xrightarrow{B} A$

A. $C_2H_4 \& \text{ alcoholic } KOH$

B. $C_2H_4Cl \& \text{ aqueous } KOH$

C. C_2H_5OH and aq. KOH

D. $C_2H_2 \& Br_2$

Answer: A

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2. Which of the following decolourises bromine water and does not give white precipitate with $AgNO_3$?

A. C_6H_6

B. C_2H_2

C. C_2H_4

D. C_2H_6

Answer: C

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3. In the following sequence of reaction the compound A is

$$A \xrightarrow{HBr} B \xrightarrow{\text{alc. KOH}} C \xrightarrow{O_3 . Zn / H_2O} CH_3CHO + HCHO$$

A. Ethylene

B. Acetic acid

C. Propene

D. 1 - Butene

Answer: C

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4. 2-Methyl propene on treatment with acidic potassium permanganate gives

A. Propanal CO_2

B. Propanone, CO_2

C. Propanoic acid, CO_2

D. Butanone, CO_2

Answer: B

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5. Decolourisation of baeyer's reagent indicates the presence of

A. Saturation of organic compound

B. Unsaturantion of organic compound

C. Aromatic nature of organic compound

D. Alicyclic nature of organic compound

Answer: B

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Exercise 1 H W Alkynes Nomenclature Methods Of Preparation

1. Which of the following method is not used in the preparation of Acetylene

A. Dehydrohalogenation

B. Dehalogenation

C. Hydrolysis

D. Dehydrogenation

Answer: D

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2. Acetylene can be obtained by the electrolysis of the following compound

A. Potassium fumerate

B. Potassium succinate

C. Potassium acetate

D. Potassium formate

Answer: A

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3. The intermediate compound formed when acetylene s hydrated in presence of dil H_2SO_4 and $HgSO_4$ is

A. Acetaldehyde

B. Ethanol

C. Vinly chloride

D. Ethenal

Answer: B

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4. The acidic nature of hydrogens in acetylene cannot be explained by the reaction with

A. Sodium metal

B. Ammonical cuprous chloride solution

C. Ammonical silver nitrate solution

D. HCN

Answer: D

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5. What is the product formed when acetylene reacts with hypochlorous acid.

A. CH_3COCl

B. $ClCH_2CHO$

C. Cl_2CHCHO

D. $ClCH_2COOH$

Answer: C

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6. Acetylene does not show which of the following reactions?

A. Condensation

B. Polymerization

C. Addition reactons

D. Combustion reaction

Answer: A

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7. The monosodium salt of acetylene on treating with methyl chloride forms

A. $CH \equiv C.COOH$

B. $CH \equiv C - CH_3$

C. $CH_3C \equiv CCH_3$

D. $CH \equiv C.CH_2CH$

Answer: B

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8. x' on ozonolysis gives a dial while 'y' reacts with Baeyer's reagent to give a diol. Then 'x' and 'y' respectively are

A. $C_2H_2 \& C_6H_6$

B. $C_2H_4 \& C_2H_2$

C. $C_2H_2 \& C_2H_4$

D. $C_2H_4 \& C_6H_6$

Answer: C

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9. Which of the following is true

A. Acetylene is more reactive than ethylene to an electrophilic attack

B. Acetylene is less reactive than ethylene towards electrophilic attack

C. Acetylene may show more reactivity or less reactivity towards electrophilic attack

D. Acetylene and ethylene show identical reactivities

Answer: B

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Exercise 1 H W Benzene Structure Aromaticity

1. Which of the following meet the requirements of the Huckel rule for aromatic compound

A. Naphthalene

B. Cyclohexane

C. 1, 3, 5, 7 - Cyclooctatetraene

D. 1, 3 - Cyclobutadiene

Answer: A

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2. The ratio of sigma and pi bonds in benzene is

A. $4:1$

B. $2:3$

C. $6:1$

D. 1 : 1

Answer: A

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Exercise 1 H W Preparation Properties

1. Benzene does not undergo polymerisation due to

A. Cyclic Nature

B. Aromatic Nature

C. Resoance

D. Steric effect

Answer: C

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2. Eormation of Benzene from Acetylene is

A. Trimerisation

B. Tetramerisation

C. Dimerisation

D. Condiensation

Answer: A

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3. In nitrating mixture HNO_3 acts as a

A. Base

B. Acid

C. Reducing agent

D. Catalyst

Answer: A

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4. Benzene reacts with . . . . To yield benzophenone.

A. $CH_3COCl + AlCl_3$

B. $C_6H_5COCl + AlCl_3$

C. $RCOCl + AlCl_3$

D. $C_2H_5COCl + AlCl_3$

Answer: B

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5. The end product of the reaction

$C_6H_6 + Cl_2 \xrightarrow{\text{Sunlight}}$? Is

A. C_6H_5Cl

B. $O - C_6H_4Cl_2$

C. $C_6H_6Cl_6$

D. $P - C_6H_4Cl_2$

Answer: C

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Exercise 1 H W Directing Influence Of Functional Groups Chemical Reactivity

1. Which of the following species is expected to yield maximum percentage of meta substitution product.

A. $ArCH_3$

B. $ArCH_2Cl$

C. $ArCHCl_2$

D. $ArCCl_3$

Answer: D

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2. The order of activites of the various Ortho and Para director is

A. $-O^- > -OH > -OCOCH_3 > -COCH_3$

B. $-OH > -O^- > -OCOCH_3 > -COCH_3$

C. $-OH > -O^- > -COCH_3 > -OCOCH_3$

D. $-O^- > -COCH_3 > -OCOCH_3 > -OH$

Answer: A

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Exercise 2 C W

1. Predict the product C obtained in the following reaction of butyne-1.

$$CH_3CH_2C \equiv CH + HCl \rightarrow B \xrightarrow{HI} C$$

A. $CH_3 - \underset{\underset{Cl}{|}}{CH} - CH_2CH_2I$

B. $CH_3 - CH_2 - CH_2 - \overset{\overset{I}{|}}{\underset{\underset{Cl}{|}}{C}} - H$

C. $CH_3 - CH_2 - \overset{\overset{I}{|}}{CH} - CH_2Cl$

D. $CH_3CH_2 - \overset{\overset{I}{|}}{\underset{\underset{Cl}{|}}{C}} - CH_3$

Answer: D

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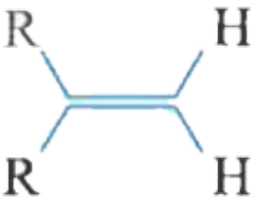
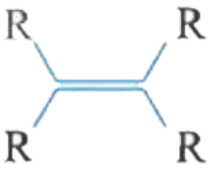
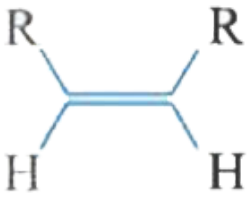
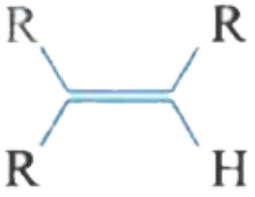
2. Which one of the following alkenes will react faster with H_2 under catalyst hydrogenation condtion?

A. 

B. 

C. 

D. 

Answer: A

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3. Products of the following reaction,

$CH_3 - C \equiv CCH_2CH_3 \xrightarrow[(ii)\,\text{Hydrolysis}]{(i)\,O_3}$? are:

A. $CH_3CHO + CH_3CH_2CHO$

B. $CH_3COOH + CH_3COCH_3$

C. $CH_3COOH + HOOC.CH_2CH_3$

D. $CH_3COOH + CO_2$

Answer: C

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4. Using anhydrous $AlCl_3$ as catalyst, which one of the following reactions produces ethylbenzene $(PhEt)$?

A. $H_3C - CH_2OH + C_6H_6$

B. $CH_3 - CH = CH_2 + C_6H_6$

C. $H_2C = CH_2 + C_6H_6$

D. $H_3C - CH_3 + C_6H_6$

Answer: C

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5. Reaction of HBr with propene in the presence of peroxide gives :-

A. isopropyl bomide

B. 3 - bromo propane

C. allyl bomide

D. n - propyl bromide

Answer: D

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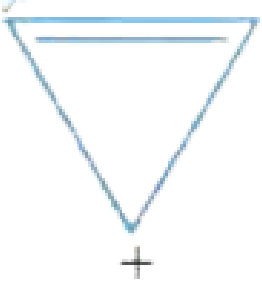
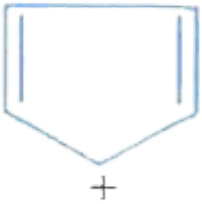
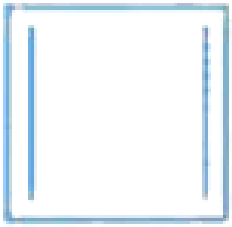
6. Among the following the aromatic compound is

A. 

B. 

C. 

D. 

Answer: A

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7. The compound, $CH_3CH_2-\overset{CH_3}{\overset{|}{C}}=CH-CH_3$ on reaction with $NaIO_4$ in the presence of $KMnO_4$ gives

A. $CH_3COCH_3+CH_3CHO$

B. $CH_3CHO+CO_3$

C. CH_3COCH_3

D. $CH_3COCH_3+CH_3COOH$

Answer: D

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8. Which alkene on ozonolysis gives CH_3CH_2CHO and $CH_3\overset{\overset{||}{O}}{C}CH_3$?

A. 

B. $CH_3CH_2CH=CHCH_2CH_3$

C. $CH_3CH_2CH = CHCH_3$

D. $CH_3 - \underset{\underset{CH_3}{|}}{C} = CHCH_3$

Answer: A

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9. Among the following alkenes,

(I)1 - butene

(II) cis -2- butene

(III) trans -2- butene

the decreasing order of stability is

A. $II > I > III$

B. $III > II > I$

C. $III > I > II$

D. $I > II > III$

Answer: B

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10. In Friedel-Crafts reaction for preparation of toluene, the reactants in addition to anhydrous $AICI_3$ are:

A. $C_6H_5Cl + CH_4$

B. $C_6H_5Cl + CH_3Cl$

C. $C_6H_6 + CH_4$

D. $C_6H_6 + CH_3Cl$

Answer: D

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11. $CH_2 = CH - CH_2 - CH - CH_2 \xrightarrow{NBS} [A]$. The major product [A] is

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

B. $CH_2 = CH - CH = CH - CH_2 - Br$

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

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

Answer: B

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12. $Na / NH_3(l)$ converts hex -3- yne to :

A. cis - hex -3- ene

B. trans - hex -3- ene

C. hexan -3- amine

D. n- hexane

Answer: B

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13. Reactivity order of halides of dehydrohalogenation is

A. $RF > RCl > RBr > RI$

B. $RI > RBr > RCl > RF$

C. $RI > RCl > RBr > RF$

D. $RF > RI > RBr > RCl$

Answer: B

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14. Among the following,the most reactive towards alcoholic KOH is

A. $CH_2 = CH - Br$

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

C. $CH_3 - CH_2 - Br$

D. $CH_3 - CH_2 - CH_2 - Br$

Answer: B

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15. The case of elimination E_1 increase in the order of alkyl halide as :

A. $1^\circ < 2^\circ < 3^\circ$

B. $3^\circ < 2^\circ < 1^\circ$

C. $1^\circ < 3^\circ < 2^\circ$

D. $3^\circ < 1^\circ < 2^\circ$

Answer: A

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16. Which of the following will give six isomers in when monochlorinated?

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

B. $CH_2 - CH_2 - CH_2 - CH_2 - CH_2$

C. $CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - cH_3$

D. None of the above

Answer: A

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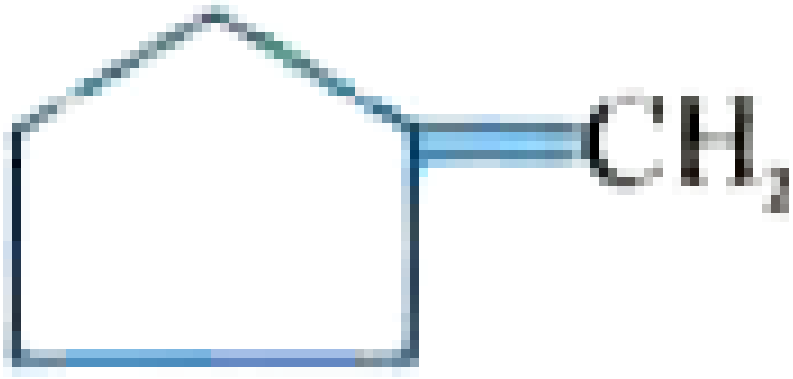
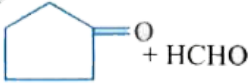
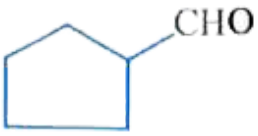
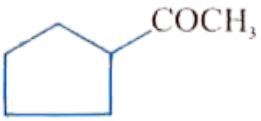


17. on

ozonolysis gives :

A. 

B. 

C. 

D. None of these

Answer: A

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18. Acetylene gives

A. white ppt. with $AgNO_3$ and red. Ppt. with Cu_2Cl_2

B. white ppt. with Cu_2Cl_2 and red. Ppt. with $AgNO_3$

C. wihit ppt. with both

D. red ppt. with both

Answer: A

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19. In the reaction given below, the product C is

$$CaC_2 \xrightarrow{H_2O} A \xrightarrow[HgSO_4]{\text{Dil. } H_2SO_4} B \xrightarrow{H_2/Ni} C$$

A. Methyl alcohol

B. Acetaldehyde

C. C_2H_5OH

D. C_2H_5

Answer: C

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20. When methane is made to react with a halogen (X_2), halides are formed, the order of reactivity is :

A. $F_2 > Cl_2 > Br_2 > I_2$

B. $Cl_2 > F_2 > Br_2 > I_2$

C. $I_2 > Br_2 > Cl_2 > F_2$

D. $Cl_2 > F_2 > I_2 > Br_2$

Answer: A

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21. An alkane of mol. Weight 72 gives on monochlorination only one product. Name the alkane:

A. 2 - methylbutane

B. n - pentane

C. 2, 2 - dimethylpropane

D. none of these

Answer: C

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22. The correct order of boiling point order for corresponding hydrocarbons is :

A. $\text{alkyne} > \text{alkane} > \text{alkene}$

B. $\text{alkane} > \text{alkene} > \text{alkyne}$

C. $\text{alkyne} > \text{alkene} > \text{alkane}$

D. $\text{alkene} > \text{alkyne} > \text{alkane}$

Answer: C

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23. Identify (Y) in the following reaction series

$$C_2H_5I \xrightarrow[\text{KOH}]{\text{Alcoholic}} (X) \xrightarrow{Br_2} (Y)$$

A. $CH_3 - CH_2 - CN$

B. $\begin{matrix} CH_2 & - & CH_2 \\ | & & | \\ Br & & Br \end{matrix}$

C. $\begin{matrix} CH_2 & - & CH_2 \\ | & & | \\ Br & & CN \end{matrix}$

D. $\begin{matrix} CH & = & CH \\ | & & | \\ Br & & CN \end{matrix}$

Answer: B

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24. The substance that would not at all be formed during the reaction of methane and chlorine in the presence of sunlight is

A. CH_3Cl

B. $CHCl_3$

C. CH_3CH_3

D. $CH_3CH_2CH_3$

Answer: D

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25. Photochemical chlorination of alkane is initiated by a process of -

A. pyrolysis

B. substitution

C. homolysis

D. peroxidation

Answer: C

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26. Natural gas is a mixture of

A. $CO + CO_2$

B. $CO + N_2$

C. $CO + H_2 + CH_4$

D. $CH_4 + C_2H_6 + C_3H_8$

Answer: D

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27. Reductive ozonolysis of but - 1, 3 - diene gives

A. $HCHO$ and $\begin{array}{|} CHO \\ CHO \end{array}$

B. CH_3CHO and glyoxal

C. CO_2 and glyoxal

D. $HCHO +$ glyoxal $+ CH_3CHO$

Answer: A

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28. In the following reaction sequences,

$$Cl - Cl \rightarrow \dot{C}l + \dot{C}l \quad \ldots(1)$$

$$\dot{C}l + CH_4 \rightarrow \dot{C}H_3 + HCl \quad \ldots..(2)$$

$$\dot{C}H_3 + \dot{C}l_2 \rightarrow CH_3Cl + \dot{C}l \quad ....(3)$$

$$\dot{C}H_3 + \dot{C}H_3 \rightarrow CH_3 - CH_3 \quad ....(4)$$

the termination step is

A. reaction 1

B. reaction 2

C. reaction 3

D. reaction 4

Answer: D

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29. Which of the following in nucleophile?

A. OH^-

B. ROR

C. $R-OH$

D. All of these

Answer: D

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30. Product [P] in the reaction is

$$CH_3-CH_2-Mg-Cl \xrightarrow{C_6H_5OH} [P]$$

A. Benzene

B. Ethane

C. Methane

D. Napthalene

Answer: B

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31. A hydrocarbon of molecular formula C_4H_6 decolourises bromine water and gives white ppt with Tollens reagent. This hydrocarbon on hydration gives butanone. The hydrocarbon is :

A. 1, 3 - butadiene

B. Cyclobutene

C. 1 - butyne

D. 2 - butyne

Answer: C

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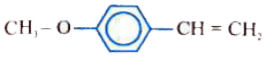
32. Which of the following alkenes is most reactive towards addition of HBr:

A. $C_6H_5 - CH = CH_2$

B. 

C. 

D. 

Answer: D

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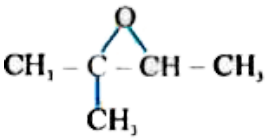
33. The major product formed in the hydroboration oxidation reaction of $(CH_3)_2C = CH - CH_3$ is

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

B. $CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle OH}{\overset{|}{\underset{|}{C}}}} - CH_2 - CH_3$

C. 

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

Answer: A

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34. Gas liberated at cathode during Kolbe's electrolysis is

A. Hydrocarbon

B. CO_2

C. H_2

D. N_2

Answer: C

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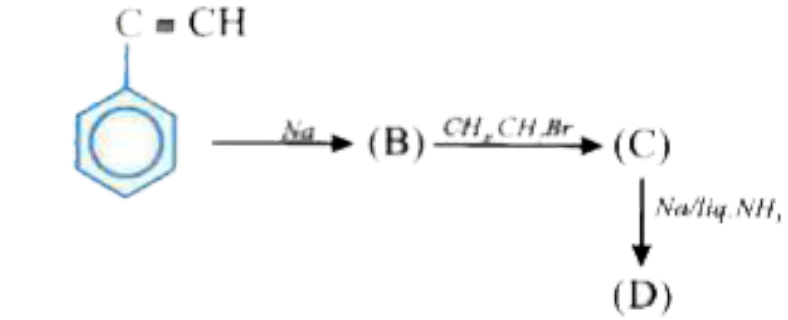
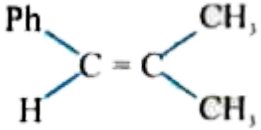
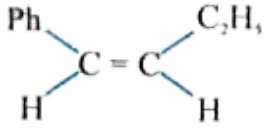
35. An organic compound

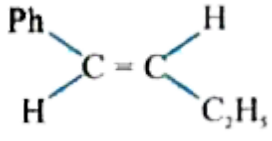


The compound "D" is

The compound "D" is

A. 

B. 

C. 

D. $Ph - c \equiv c - CH_2 - CH_3$

Answer: C

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36. Which of the following statement is correct

A. Propene cant decolorise dilute $KMnO_4$ solution

B. Buta -1, 3 - diene can form a white ppt with silver nitrate (ammonical) solution

C. 2 - pentene can decolorise purple colour of $KMnO_4$ solution

D. All of these

Answer: C

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Exercise 2 H W

1. How many mono carboxylic acids are posible which on decarboxylation form iso-pentane?

A. 6

B. 2

C. 5

D. 4

Answer: D

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2. The reagents and conditions to convert methyl iodide to methane are

A. Action of dry Ag_2O

B. KCN followed by refluxing with dil. HCL

C. aqueous $NAOH$ followed by boiling Al_2O_3 at 640 K

D. Mg in dry ether followed by boiling with water

Answer: D

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3. Propane can be best prepared by the reaction

A. $CH_3CH_2I + CH_3I + Na \xrightarrow{E_2O}$

B. $CH_3CH_2COONa + CH_3COONa \xrightarrow[\text{Electrolysis}]{H_2O}$

C. $CH_3CH_2Br + (CH_3)_2\text{CuLi} \xrightarrow{Et_2O}$

D. $CH_3CH_2CH_2COO\overline{N}a \xrightarrow[CaO\,.\,\Delta]{NaOH}$

Answer: C

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4. An alkane cannot be chlorinated by using which of the following reagents?

A. Cl_2 / hv

B. HCl

C. SO_2Cl_2

D. $t - Bu - O - Cl$

Answer: B

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5. Ethane cannot be obtained by the following

A. Heating methyl iodide with sodium metal in ether

B. Hydrogenation of ethene

C. Sodium acetate on Kolbe's electrolysis

D. Hydrolysis of Al_4C_3

Answer: D

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6. Substance which forms isomeric products mono substitution is/are

A. CH_4

B. C_2H_6

C. C_3H_8

D. All

Answer: C

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7. Which statement is not correct in the case ethane

A. It can be catalytically hydrogenated

B. When burnt produces CO_2 and H_2O

C. It is a homologue of propane

D. It can be chlorinated with chlorine

Answer: A

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8. $CH_4 + O_2 \xrightarrow{Cu\,/\,250^\circ C} X$

$CH_4 + O_2 \xrightarrow[350-500^\circ C]{Mo_2O_3} Y + H_2O$ X and Y respectively.

A. Methanol, methanol

B. Methanal, methanol

C. Methanol, methanal

D. Methanal, methanal

Answer: C

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9. Which of the following is a controlled oxidation reaction?

A: $CH_{4(ag)} + 2O_{2(ag)} \rightarrow CO_{2(g)} + 2H_2O((l))$

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

C: $CH_{4(g)} + O_{2(g)} \xrightarrow{Mo_2O_3 \rightarrow HCHO + H_2O_{(l)}}$

D: $CH_{4(g)} + O_{2(g)} \xrightarrow{Cu\,/\,523K\,/\,100atm} 2CH_3OH_{(l)}$

A. Only D

B. Both A & B

C. B, C, D only

D. Both C & D

Answer: C

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10. $Al_4C_3 \xrightarrow{\text{Hydrolysis}} A \xrightarrow[HNO_3\,(\text{vopour})]{400^\circ - 475^\circ C} B$. A and B are

A. $C_2H_2 \& C_2H_3NO_2$

B. $CH_4 \& CH_3NO_2$

C. $CH_4 \& CH_3NO_3$

D. $C_2H_2 \& CH_3CN$

Answer: B

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11. How many chiral compounds are possible on monochlorination of 2-Methyl butane ?

A. 8

B. 3

C. 4

D. 6

Answer: C

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12. $X \xrightarrow[\frac{1}{2}H_2]{Na} Y \xrightarrow[\Delta]{NaOH+CaO} Z$, if Z is the first homologue of alkane series, then X

A. Methanoic acid

B. Bromo ethane

C. Ethyl alcohol

D. Ethanoic acid

Answer: D

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13. The volume of CH_4 at NTP is formed when 20.5 g of CH_3COONa is treated with soda time

A. 4.4 l

B. 2.2 l

C. 3.2 l

D. 5.6 l

Answer: D

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14. For the given reaction how many products will obtain (all isomers on monobromination)?

$\xrightarrow{Br_2/hv}$ Products

A. 1

B. 6

C. 4

D. 3

Answer: B

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15. Which of the following reactions has Zero activation energy?

A. $CH_4 + Cl^{\cdot} \rightarrow \dot{C}H_3 + HCl$

B. $Cl + Cl \xrightarrow{hv} 2Cl^{\cdot}$

C. $CH_3^{\cdot} + CH_3^{\cdot} \rightarrow CH_3 - CH_3$

D. $CH_3^{\cdot} + Cl - Cl \rightarrow CH_3 - Cl + Cl^{\cdot}$

Answer: C

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16. Which of the following can produce a racemic mixture on monobromination?

A. 

B. 

C. 

D. $CH_3 - CH_3$

Answer: C

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17. $$\begin{array}{ccc} & CH_3 & & & CH_3 - Br \\ & | & & & | \\ CH_3 - & C & - CH_3 + & CH_3 - & CH - CH_3 \\ & | & & & \\ & Br & & & \\ & \text{(A)} & & & \text{(B)} \end{array}$$

$$\begin{array}{c} CH_3 \\ | \\ CH_3 - \text{CH} - CH_3 \end{array} \xrightarrow{Br_2}$$ the percentage yeild of 'A' is (The relative reactivities of $1^\circ, 2^\circ, 3^\circ$ $-$ hydrogens are $1:3.8:5$)

A. $36\ \%$

B. $64\ \%$

C. $72\ \%$

D. $28\ \%$

Answer: A

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18. $X \xrightarrow{NaOH+CaO} CH_3-\overset{CH_3}{\underset{CH_3}{\overset{|}{\underset{|}{C}}}}-CH_3$

$X \xrightarrow{\text{Kolbe's electrolysis}} y$ 'y' is

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

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

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

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

Answer: B

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19. $CH_2 = CH_2 + H_2 \xrightarrow{Pt, T_1 K} C_2H_6$

$CH_2 = CH_2 + H_2 \xrightarrow{Ni, T_2 K} C_2H_6$

The correct relation among the following is

A. $T_1 > T_2$

B. $T_2 > T_1$

C. $T = T_2$

D. $T_1 > 2T_2$

Answer: B

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20. $2-$ Methylbutane on reacting with bromine in the presence of sunlight gives mainly

A. 1 - bromo -2- methylbutane

B. 2 - bormo -2- methylbutane

C. 2 - bormo -3- methylbutane

D. 1 - bromo -3- methylbutane

Answer: B

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21. Which of the following is not obtained when propyl chloride and methyl chloride react with sodium in dry ether?

A. C_2H_6

B. C_4H_{10}

C. C_3H_8

D. C_6H_{14}

Answer: C

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22. The volume of methane at N.T.P formed from 8.2 g of sodium acetate by fusion with soda lime is

A. 10 L

B. 11.2 L

C. 5.6 L

D. 2.24 L

Answer: D

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23. Reaction of ROH with $R'MgX$ produces

A. RH

B. R'H

C. R-R

D. R'-R'

Answer: B

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24. In Wurtz reaction, n-hexane is obtained from

A. n - propyl chloride

B. n - butyl chlorine

C. Ethyl chloride

D. Isopropyl chloride

Answer: A

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25. The increasing order of reduction of alkyl halides with zinc and dilute HCl is

A. $R - Cl < R - I < R - Br$

B. $R - Cl < R - Br < R - I$

C. $R - I < R - Br < R - Cl$

D. $R - Br < R - I < R - Cl$

Answer: B

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26. nitroethane ca be obtained from ethane by following

A. Action with HNO_3 concentrated at $100^\circ C$

B. Action with dil HNO_3 at $200^\circ C$

C. Action with HNO_3(concentrated) at $475^\circ C$

D. Action with HNO_3(Concentrated at $0^\circ C$)

Answer: C

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27. The following substance reacts with ater to give ethane

A. CH_4

B. C_2H_5MgBr

C. C_2H_4OH

D. $C_2H_5OC_2H_5$

Answer: B

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28. $(CH_3)_3 - C - MgCl$ on reaction with D_2O produces

A. $(CH_3)_3CD$

B. $(CH_3)_3COD$

C. $(CH_3)_3CH$

D. $(CD_3)_3COD$

Answer: A

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29. The ratio of products, 1 - chloropropane to 2 - chloropropane respectively formed in the chlorination of propane if all the hydrogens are abstrated at equal rates is

A. $50:50$

B. $25:75$

C. $75:25$

D. $12.5:87.5$

Answer: C

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30. Of the five isomeric hexanes, the isomer which can give two monochlorinated compounds is

A. n - hexane

B. 2, 3 - dimethyl butane

C. 2, 2- dimethyl butane

D. 2 - methyl pentane

Answer: B

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31. Alkyl halides react with dialkyl copper reagents to give

A. Alkenes

B. Alkyl copper halide

C. Alkanes

D. Alkenyl halides

Answer: C

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32. 2.84 g of methayl iodide was completely converted into methyl magnesium iodide and was decomposed by excess of ethanol. The volume of the gaseous hydrocarbon produced at NTP will be

A. 22.4 litre

B. 224 mL

C. 0.448 litre

D. 0.224 litre

Answer: C

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33. Which liberate methane gas on treatment with water?

A. Silicon carbide

B. Calcium carbide

C. Aluminium carbide

D. Iron carbide

Answer: C

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34. As compared to melting poitns of even carbon chaini isomers,t he melting points of odd carbons chains alkanes are:

A. Lower

B. Higher

C. Same

D. Not depend upon branching

Answer: A

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Exercise 2 H W Alkenes Preparations Of Alkenes

1. Consider the following reaction

$X + HCl \xrightarrow{Anh.\ \ AlCl_3} C_2H_5Cl \xrightarrow{Aq.\ \ KOH} Y$. Y can be converted to X on heating with.

A. $Al_2O_3, 350^\circ C$

B. $Cu, 300^\circ C$

C. $Ca(OH)_2 + CaOCl_2, 60^\circ C$

D. $NaOH / I_2, 60^\circ C$

Answer: A

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2. $C_2H_5Cl \xrightarrow{\text{Alcoholic } KOH} A \xrightarrow{dil.H_2SO_4/H_2O} B$

Here A and B are

A. C_2H_5OH, C_2H_4

B. C_2H_4, C_2H_5OH

C. C_3H_8, C_2H_5OH

D. $C_2H_2 + C_2H_5OH$

Answer: B

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Exercise 2 H W Properties Of Alkenes

1. $CH_3 = CH_2 \xrightarrow{HCl} A \xrightarrow[\text{Dry ether}]{Mg} B \xrightarrow{\text{Hydrolysis}} C$

Then 'C' is

A. $CH_3 - CH_2 - Cl$

B. $CH_3 - CH_2 - MgCl$

C. CH_4

D. $CH_3 - CH_3$

Answer: D

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2. An alkene on vigorous oxidation with $KMnO_4$ solution produces only acetic acid. The alkene is .

A. $CH_3 - CH_2 - CH = CH_2$

B. $CH_3 - CH = CH - CH_3$

C. $(CH_3)_2 - C = CH_2$

D. $CH_3CH = CH_2$

Answer: B

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3. $C_2H_6 \xrightarrow[1000^\circ C]{\Delta} A \xrightarrow{S_2Cl_2} B$. Here 'B' is

A. $(C_2H_5)_2S$

B. $(C_2H_4Cl)_2S$

C. $(CH_3Cl)_2S$

D. $(CH_3)_3S$

Answer: B

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4. $CH_3COOK \xrightarrow{\text{Electrolysis}} A \xrightarrow[1000^\circ C]{\Delta} B \xrightarrow[KMnO_4]{\text{cold alkaline}} C$ Here 'C' is

A. CH_3COOH

B. $CH_2OH - CH_2OH$

C. $CHO - CHO$

D. $CHOOH - CHOOH$

Answer: B

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5. An alkene gives two moles of $HCHO$, one mole of CO_2 and one mole of CH_3COCHO on ozonolysis. The structure of alkene is

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

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

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

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

Answer: D

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6. $CH_3 - CH_2Cl \xrightarrow{\text{alcoholic KOH}} A \xrightarrow{Br_2 / CCl_4} B \xrightarrow[\Delta]{Zn / \text{alcohol}} C$ C is

A. `Acetylene

B. Ethylene

C. Ethane

D. Methane

Answer: B

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7. $CH \equiv CH \xrightarrow[\text{quinoline}]{H_2 / Pd - BaSO_4} A \xrightarrow{Cl_2 / H_2O} B$, 'B' is

A. $C_2H_4Cl_2$

B. C_2H_4Cl

C. $Cl - CH_2CH_2OH$

D. $CHCl_3$

Answer: C

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8. IUPAC name of the product formed when HOCl is added to but-1-ene produces.

A. 2 - hydorxy -1- chloro butane

B. 1 - chloro butane -2- ol

C. 2 - chloro butane -1- ol

D. 3 - hydrodxy -1- chloro butane

Answer: B

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9. $CH_2Br - CH_2Br \xrightarrow{Zn_3\,\Delta} A \xrightarrow{H_2/Ni} B \xrightarrow{HNO_3/450^\circ C} C$

Here 'C' is

A. CH_3NO_2

B. $C_2H_5NO_2$

C. $C_2H_5 - O - N = O$

D. $CH_3 - O - N = O$

Answer: B

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10. $HC \equiv Ch \xrightarrow[\text{Quinoline}]{H_2 / Pd - BaSO_4} A \xrightarrow[AlCl_3]{HCl} B \xrightarrow[\text{Dry ether}]{Na} C$. 'C' is

A. C_2H_6

B. C_4H_{10}

C. C_2H_5Cl

D. C_3H_7Cl

Answer: B

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11. Which one of the following compounds will give in the presence of peroxide a product different from that obtainded in the absence peroxide ?

A. 1 - butene

B. 2 - butene, HCl

C. 1 - butene, HBr

D. 2 - butene, HBr

Answer: C

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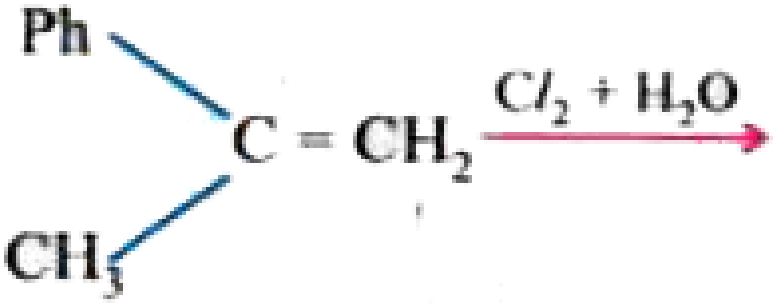
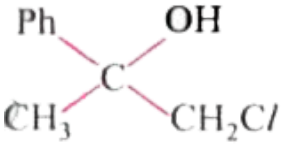
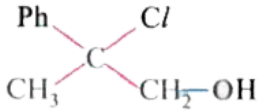
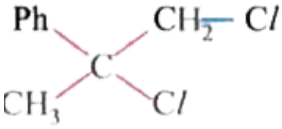
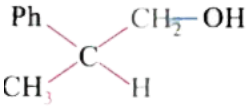


12. Major product :

A. 

B. 

C. 

D. 

Answer: A

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13. Which of the following shows geometrical isomerism

A. $BrCH = C = C = CHBr$

B. 

C. $CH = C = C = CBr$

D. $CH_2 = C = C = CHBr$

Answer: A

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14. Which of the following alkene in acid catalysed hydration form $2-$ methyl propan $-2-ol$?

A. $(CH_3)_2C = CH_2$

B. $CH_3CH = CH_2$

C. $CH_3CH = CHCH_3$

D. $CH_3CH_2CH = CH_2$

Answer: A

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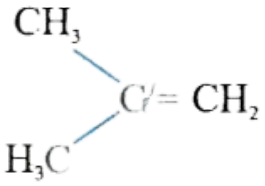
15. Which among the following alkenes will be most reactive during hydrogenation reaction

A. $CH_3 - CH = CH_3$

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

C. $H_2C = CH_2$

D. 

Answer: C

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16. Arrange the following hydrogen halides in order of their decreasing reactivity with propene.

A. $HCl > HBr > HI$

B. $HBr > HI > HCl$

C. $HI > HBr > HCl$

D. $HCl > HI > HBr$

Answer: C

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17. Ethylene gives epoxy ethane on oxidation with

A. $KMnO_4 / OH^-$

B. $K_2Cr_2O_7 / H^+$

C. $Ag_2O / 200^\circ C$

D. $H_2SO_4 / 170^\circ C$

Answer: C

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18. Addition of HBr on, $CH \equiv C - CH_2 - CH = CH_2$ and $CH \equiv C - CH = CH_2$ separately given:

A. $CH \equiv C - CH_2 - CHBr - CH_3$ and $CH_2 = C(Br) - CH = CH_2$

B. $CH_2 = C(Br) - CH_2 - CHBr - CH_3$ and $CH_2 = -CH(Br) = CH_2$

C. $CH \equiv C - CH_2 - CHBr - CH_3$ and $CH_2 \equiv C(Br) - CH - CH_3$

D. both 1 and 2

Answer: A

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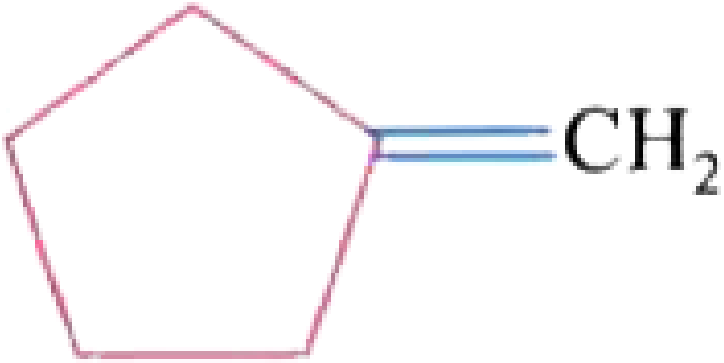
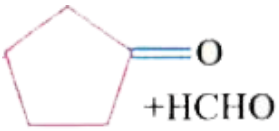
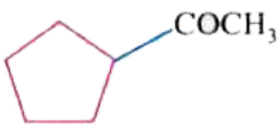


19.

on ozonolysis gives

A. 

B. 

C. 

D. all the above

Answer: A

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20. The product of following reaction

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

A. $CH_3-\overset{\overset{CH_3}{|}}{\underset{\underset{H_3C}{|}}{C}}-\underset{\underset{OH}{|}}{CH}-CH_3$

B. $CH_3-\overset{\overset{CH_3}{|}}{\underset{\underset{H_3C}{|}}{C}}-\underset{\underset{CH_3OH}{|}}{CH}$

C. $CH_3-\overset{\overset{OH}{|}}{\underset{\underset{H_3C}{|}}{C}}-\underset{\underset{CH_3}{|}}{CH}$

D. $HOCH_2-\overset{\overset{CH_3}{|}}{\underset{\underset{H_3C}{|}}{C}}-CH_2-CH_2OH$

Answer: A

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

A. Alkaline $KMnO_4$

B. $B_2H_6 \& \text{ alk. } H_2O_2$

C. $O_3 / \text{zinc dust}$

D. $OsO_4 / CHCl_3$

Answer: B

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22. 2-methylpropene is isomeric with butene-1. They can be distinguished by:

A. Baeyer's reagent

B. Ammonical $AgNO_3$

C. Br_2 solution

D. O_3, Zn / H_2O

Answer: D

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23. The reaction of propene with HOCl proceeds via the addition of :

A. H^+ in the first step

B. Cl^+ in the first step

C. OH^- in the first step

D. Cl^+ and OH^- in the single step

Answer: B

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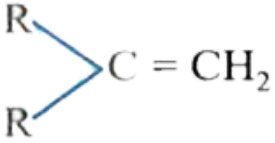
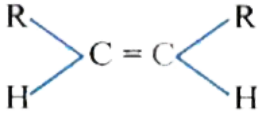
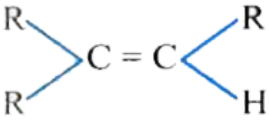
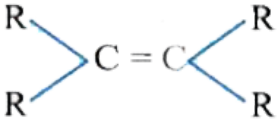
24. The catalytic hydrogentaion more easier in case of which alkene?

A. 

B. 

C. 

D. 

Answer: B

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25. Trans - 2 phenyl 1 - bromocyclopenta ne on reaction with alcoholic KOH produces

A. 4 - phenylcyclopentene

B. 2 - phenylcyclopentene

C. 1 - p henylcyclopentene

D. 3 - phenylcyclopentene

Answer: C

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26. Which of the following reaction will yield 2,2-dibromopropane?

A. $CH_3 - CH = CH_2 + HBr \rightarrow$

B. $CH_3 - C \equiv CH + HBr \rightarrow$

C. $CH_3 - CH = CHBr + HBr \rightarrow$

D. $CH \equiv CH + HBr \rightarrow$

Answer: B

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27. One mole of a symmetrical alkene on ozonolysis gives two moles of an aldehyde having a molecular mass of 44u. The alkene is:

A. Ethene

B. Propene

C. 1 - butene

D. 2 - butene

Answer: D

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28. Ozonolysis of an organic compound gives formaldehyde as one of the products. This confirms the presence of

A. Two ethylenic double bonds

B. A vinyl group

C. An isopropyl group

D. An acetylenic triple bond

Answer: B

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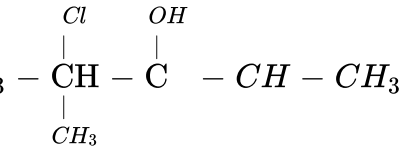
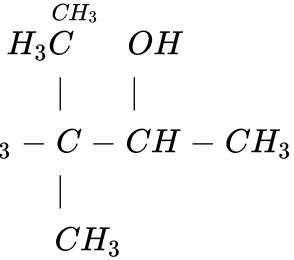
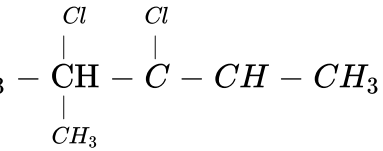
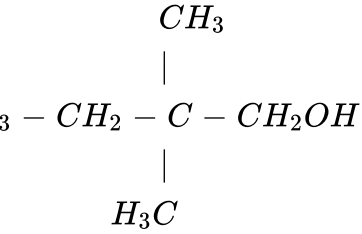
29. 3-Methyl-2-pentene on reaction with HOCl gives-

A. 

B. 

C. 

D. 

Answer: D

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30. In the following sequence of reactions the products D is

$C \equiv CH \xrightarrow{HBr} A \xrightarrow{HBr} B \xrightarrow{alcKOH} C \xrightarrow{NaNH_2} D$. D is

A. Ethanol

B. Ethyne

C. Ethanal

D. Ethene

Answer: B

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31. 1-Butyne on reductive ozonolysis gives.

A. $CH_3CH_2CH_2COOH$

B. CH_3COOH

C. CH_3CH_2COCHO

D. $CH_3COOH + CH_3CHO$

Answer: C

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32. Which of the following compound 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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33. $CH \equiv CH \xrightarrow{NaNH_2} [A] \xrightarrow{CH_3Br} [B]$

A. $CH_2 = CH - CH = CH_2$

B. $HC \equiv C - CH_3$

C. $CH_2 = CH - CH_3$

D. $CH_3 - CH_2 - CH_3$

Answer: B

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34. Hydration of ethyne to ethanal takes place through the formation of

A. $CH_3CH(OH)_2$

B. $CH_2 = CHOH$

C. $CH_2 = CHO$

D. $CH \equiv C^-$

Answer: B

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35. A compound on dehydrohalogenatio with alcoholic KOH gives alkyne but on dehalogenation with zinc dust gives alkene. The compound

A. C_2H_5Br

B. CH_3CHBr_2

C. $CH_2Br - CH_2Br$

D. $CHBr_2 - CHBr_2$

Answer: C

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36. $CaC_2 \xrightarrow{\text{Hydrolysis}} A \xrightarrow{HgSO_4 + dil.\ H_2SO_4} B$. B is

A. Acetylene

B. Acetaldehyde

C. Acetone

D. Acetic acid

Answer: B

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37. $CaC_2 + H_2O \rightarrow A + B \xrightarrow{1\text{ mole } Na} C \xrightarrow{C_2H_5I} D$. D is

A. 1 - butene

B. Propene

C. 1 - pentene

D. 1 - Butyne

Answer: D

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38. $\underset{Cl}{\underset{|}{CH_2}} - \underset{Cl}{\underset{|}{CH_2}} \xrightarrow{Alc.\quad KOH} A(1mo \leq HCl) \rightarrow B$, B is

A. Ethyl chloride

B. 1, 2 - dichloro ethene

C. Vinlyl chloride

D. Ethylidine chloride

Answer: C

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39. $CH \equiv Ch \xrightarrow{HCl} A \xrightarrow{\text{Polymerisation}} B$

The polymer B is

A. orlon

B. PVC

C. nylon

D. teflon

Answer: B

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40. $H-C\equiv C-H+2NaNH_2\rightarrow A\xrightarrow[CH_3Cl]{2\text{ mole}}B$

then 'B' is

A. 1 - Butyne

B. 2 - Butyne

C. 2 - Pentyne

D. Propyne

Answer: B

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41. When 2-pentyn is treated with dilute H_2SO_4 and $HgSO_4$ the product formed is

A. 1 - pentanol

B. 2 - pentanol

C. 2 - pentanone

D. 3 - pentanone

Answer: C

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42. The cyclic polymerisation of methyl acetylene produces

A. Benzene

B. O - xylene

C. 1, 3, 5 - Trimethyl benzene

D. 1, 3, 5- Tri methyl cyclo hexane

Answer: C

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43. The compounds 1-butyne and 2-butyne can be distinguished by using

A. Bromine water

B. $KMnO_4$ solution

C. Tollen's reagent

D. Chlorine gas

Answer: C

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44. Which of the following orders regarding acidic strength is correct

A. $CH_3COOH > CH_3CH_2OH > CH \equiv CH$

B. $CH_3COOH > CH \equiv CH > CH_3CH_2OH$

C. $CH \equiv CH > CH_3COOH > CH_3CH_2OH$

D. $CH \equiv CH > CH_3CH_2OH > CH_3COOH$

Answer: A

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45. Anunknown compound 'A' has a molecular formula of C_4H_6 when 'A' is treated with an excess of Br_2 a new substance 'B' with formula $C_4H_6Br_2$ is formed. A forms a white precipitate with ammonical silver nitrate solution 'A' may be

A. Butyne

B. Butyne - 2

C. Butene

D. Butene - 1

Answer: A

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46. The reduction of 4 - octyne with H_2 in the presence of $Pd/CaCo_3$ quinoline gives

A. Trans -4- octene

B. cis -4- octene

C. A mixture of cis and trans -4 octene

D. A completely reduced productc C_8H_{18}

Answer: B

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47. The hydrolysis of Mg_2C_3 produces

A. Acetylene

B. Propyne

C. Butyne

D. Ethylene

Answer: B

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48. Pure acetylene has sweet smell, where as impure gives garlic occur due to presence of

A. NH_3

B. PH_3

C. SbH_3

D. HCl

Answer: B

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49. The stronger base is

A. $CH_3CH_2^-$

B. $CH_2 = CH^-$

C. $CH \equiv C^-$

D. Cl^-

Answer: A

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50. The colour of the precipitate formed when acetylene is passed through ammonical cuprous chloride solution is.

A. While

B. Red

C. Blue

D. Green

Answer: B

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51. What is the product when acetylene reacts with HCN

A. CH_3COCl

B. $CH_2 = CH - CN$

C. Cl_2CHCHO

D. $ClCH_2COOH$

Answer: B

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52. Westron is the solvent obtained by the reaction of chlorine with

A. Ethylene

B. Ethyne

C. Ethane

D. Methane

Answer: B

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53. The final product formed when ethyne and acetic acid react is

A. vinyl acetate

B. Ethyl acetate

C. Acetylene acetic acid

D. Ethylidene acetate

Answer: D

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54. A compound (C_5H_8) reacts with ammoniacal $AgNO_3$ to give a white precipitate and reacts with excess of $KMnO_4$ solution to give $(CH_3)_2CH-COOH$. The compound is

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

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

C. $(CH_3)_2CHC\equiv CH$

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

Answer: C

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55. 1-butyne on reaction with hot alkaline $KMnO_4$ gives:

A. $CH_3CH_2CH_2COOH$

B. $CH_3COOH + CH_3COOH$

C. CH_3COOH only

D. $CH_3CH_2COOH + HCOOH$

Answer: D

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56. Order of acidity of H_2O, NH_3 and acetylene is :

A. $NH_3 > CH \equiv CH > H_2O$

B. $H_2O > NH_3 > CH \equiv CH$

C. $H_2O > CH \equiv CH > NH_3$

D. $NH_3 > H_2O > CH \equiv CH$

Answer: C

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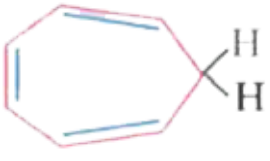
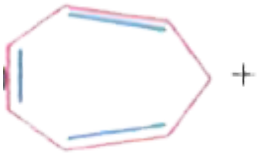
57. Which of the following is expected to aromatic

A. 

B. 

C. 

D. 

Answer: D

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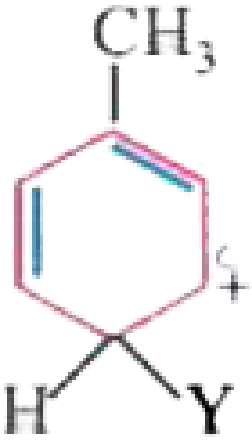
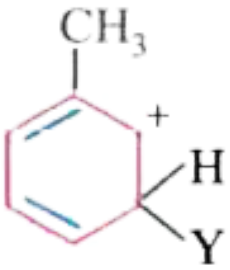
58. Which of the following carbocation is expected to be least stable

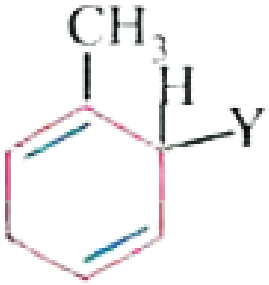
A. 

B. 

C.



D.



Answer: C

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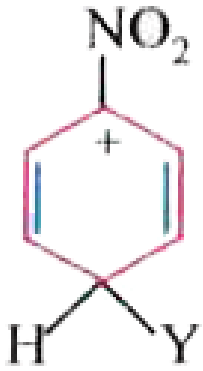
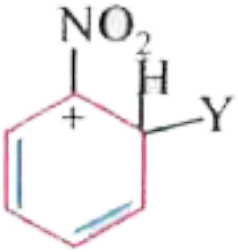
59. Which of the following carbocations is expected to be most stable ?

A.

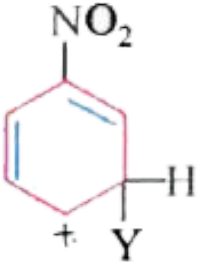


B.

C.



D.



Answer: D

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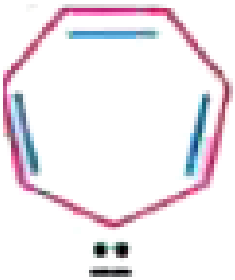
60. Which of the following structure will not have 4π electrons

A. 

B. 

C. 

D. 

Answer: D

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61. $CaC_2 \xrightarrow{H_2O} A \xrightarrow{\text{Red tube hot}} B \xrightarrow[CH_3Cl]{AlCl_3} C$

In this sequece B and C are.

A. Benzene & acetylene

B. Toluene & Benzene

C. Benzene & Toluene

D. Toluene & acetylene

Answer: C

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62. $C_2H_2 \xrightarrow{\text{Red hot tube}} A \xrightarrow{\text{fuming } H_2SO_4} B$ then 'B' is

A. Benzene

B. Toluene

C. Chloro benzene

D. Benzene sulphoric acid

Answer: D

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63. $A \xrightarrow{\text{soda lime}} C_6H_6 \xrightarrow{Cl_2, hv} B$, In this reaction A and B are respectively.

A. Phenol, chlorobenzene

B. Chlorobenzene, lindane

C. Sodium benzoate, BHC

D. $C_2H_2 \& BHC$

Answer: C

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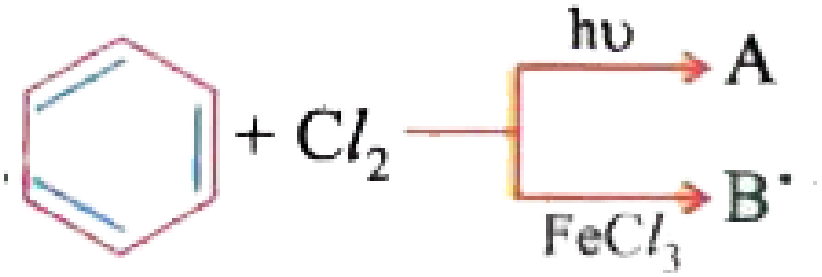

64. A & B respectively are

A. Hexachlorocyclohexane & C_6H_5Cl

B. Chlorobenzene & Hexachlorobenzene

C. o - p and p - Dichlorobenzene & chlorobenzene

D. Chlorobenzene & $C_6H_5Cl_6$

Answer: A

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65. The descending order of reactivity of C_2H_6, C_2H_4, C_2H_2 and C_6H_6 towards addition reaction is

A. $C_2H_4 > C_2H_2 > C_6H_6 > C_2H_6$

B. $C_2H_2 > C_2H_4 > C_6H_6 > C_2H_6$

C. $C_6H_6 > C_2H_6 > C_2H_4 > C_2H_2$

D. $C_2H_{56} > C_2H_4 > C_2H_2 > C_6H_6$

Answer: A

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66. A new carbon-carbon bond is formed in

A. Cannizzaro's reaction

B. Friedel - craft reaction

C. Clemmenson reduction

D. All the above

Answer: B

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67. $X \xrightarrow[\text{Boil}]{\text{Dil. } H_2SO_4} Y \xleftarrow[\Delta]{\text{Zndust}} Q$ where 1 mole Y on ozonolysis yields three moles of ethane - 1, 2 - dial, X and Q respectively are

A. Napthalene, Phenol

B. Benzene sulphonic acid, Nitrobenzene

C. Benzene sulphonic acid , Phenol

D. Phenol, Toluene

Answer: C

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68. In which of the following reactions, aromatic character is retained?

A. $C_6H_6 \xrightarrow{H_2/Ni} X$

B. $C_6H_6 \xrightarrow[Zn/H_2O]{O_3} Y$

C. $C_6H_6 \xrightarrow[AlCl_3]{CH_3COCl} Q$

D. $C_6H_6 \xrightarrow[\text{light}]{Cl_2} R$

Answer: C

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69. Number of $\sigma sp^2 - sp^2$ bonds present in a molecule of X in the process $C_6H_6 \xrightarrow[200^\circ C]{H_2/Ni} X$ is

A. 6

B. 3

C. 12

D. Zero

Answer: D

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70. What is 'X' in the following reaction ?

$$C_6H_5 - C \equiv C - H \xrightarrow[\text{dil. } H_2SO_4]{Hg^{+2}} X$$

A. $C_6H_3 - COCH_3$

B. $C_6H_5 - CH_2CHO$

C. $C_6H_5 - CHO$

D. $C_6H_5 - CH_2OH$

Answer: A

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71. Fluorobenzene (C_6H_5F) can be synthesized in the laboratory ,

A. By heating phenol with HF and KF

B. From aniline by diazotisation followed by heating the diazonium salt with HBF_4

C. By direct fluorination of benzene with F_2 gas

D. By reacting bromo benzene with NaF soltuion

Answer: B

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72. The electrophile in Acetylation of Benzene is

A. $\overset{\oplus}{R}$

B. $R\overset{\oplus}{C}O$

C. $\overset{\oplus}{C}_6H_5$

D. $N\overset{\oplus}{O}_2$

Answer: B

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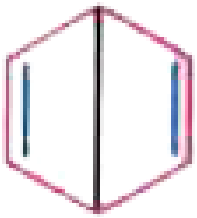
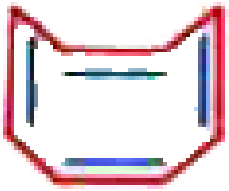
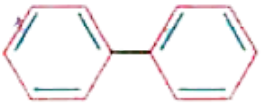
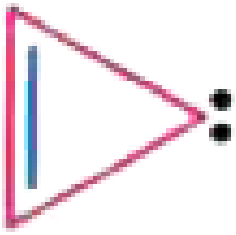
73. Four structures are given in option (1) to (4). Examine them and select the aromatic structure.

A. 

B. 

C. 

D. 

Answer: C

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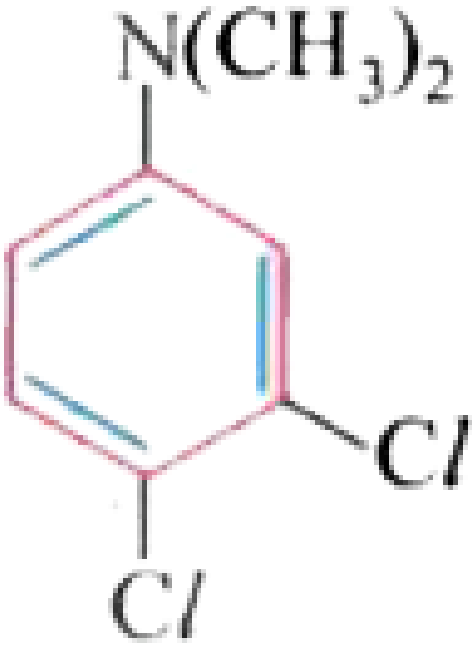
74. Which of the following is the correct IUPAC Name of the compound



A. 1, 2- dichloro -4- (N, N-dimethyl) aniline

B. Dimethyl - (3, 4-dichlorophenyl) amine

C. 3, 4 - dichloro -N, N-dimethyl aniline

D. N, N - dimethylamine -3, 4- dichlorobenzene

Answer: C

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Exercise 2 H W Preparation Properties

1. Three moles of glyoxal are obtained by the ozonolysis, followed by hydrolysis (in presence of Zn) os

A. C_2H_2

B. C_2H_4

C. C_6H_6

D. C_6H_{12}

Answer: C

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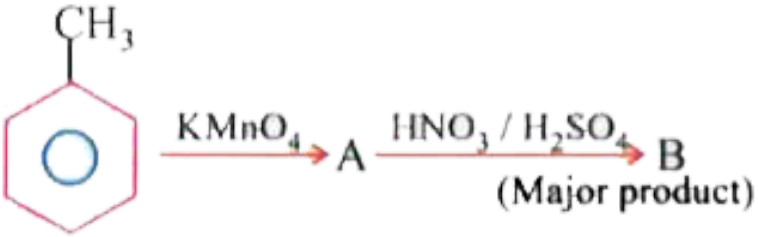

2. **The product B is**

The product B is

A. 3 - Nitrobenzoic acid

B. 3 - Nitrotoluene

C. 4 - Nitrotoluene

D. 4 - Nitrobenzoic acid

Answer: A

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3. Amongst the following, the compound that can be most readily sulphonated

A. Benzene

B. Methoxy benzene

C. Toulene

D. Chloro benzene

Answer: B

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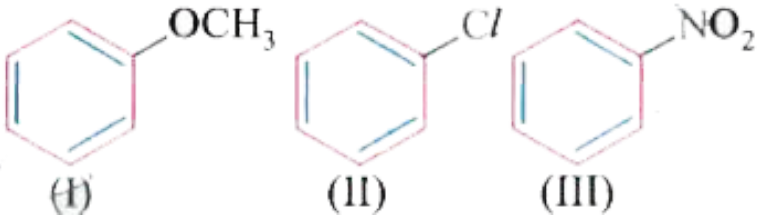
4. Arrange the following set of compounds in the order of their decreasing relative reactivity with an electrophile



A. $I > II > III$

B. $I = II = III$

C. $I < II < III$

D. $I > II < III$

Answer: A

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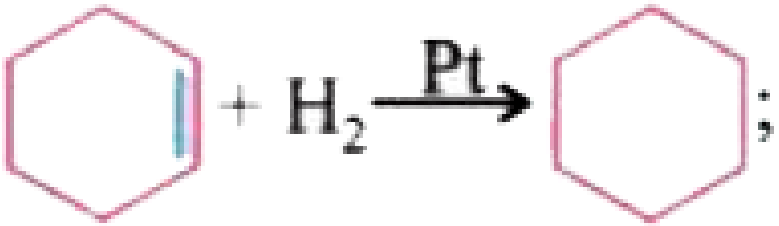
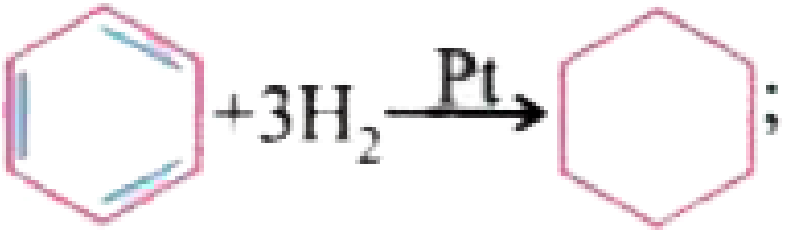


5.

$\Delta H = -x$ k.cal/mole



$\Delta H = -y$ k.cal/mole

The correct relation among the following is

A. $x = y$

B. $y = 3x$

C. $3x - y = 36\ \mathrm{k.cal}$

D. $x - 3y = 36\ \mathrm{k.cal}$

Answer: C

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Exercise 3

1. Which of the compounds with molecular formula C_5H_{10}yields acetone on ozonolysis ?

A. 2 - methyl -2- butene

B. 3 - methyl -1- butene

C. Cyclopentane

D. 2 - methyl -1- butene

Answer: A

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2. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH = CH_2 + HBr \rightarrow \text{'}A\text{'}$

'A' (predominantly) is:

A. $CH_3 - \underset{\underset{CH_3}{|}}{\underset{\underset{Br}{|}}{CH}} - CH_3 - CH_2Br$

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

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

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

Answer: B

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3. How many stereoisomerse does this molecule has?

$CH_3CH = CHCH_2CHBrCH_3$

A. 2

B. 4

C. 6

D. 8

Answer: B

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4. Benzene reacts with CH_3Cl in the presence of anyhydrous $AlCl_3$ to form

A. toluene

B. chlorobenzene

C. benzylchloride

D. xylene

Answer: A

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5. Which of the following compounds will show geometric isomerism?

A. Cyclohexene

B. 2 - hexene

C. 3 - hexyne

D. 1, 1- diphenyl ethylene

Answer: B

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6. Which of the following compounds will exhibit cis-trans (geometrical) isomerism ?

A. 2 - Butene

B. Butanol

C. 2- Butyne

D. 2 Butenol

Answer: A

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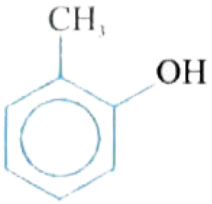
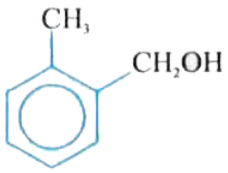
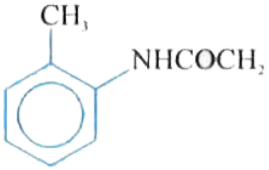
7. Which one of the following is most reactive towards electrophilic reagent ?

A. 

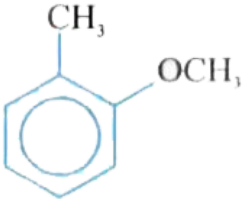
B.



C.



D.



Answer: A

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8. Among the following compounds the one that is most reactive towards electrophilic nitration is

A. Nitrobenzene

B. Toluene

C. Benzene

D. Benzoic Acid

Answer: B

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9. In the following reaction :

$$H_3C-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH=CH_2 \xrightarrow{H_2O/H^{\oplus}} A$$

The major product A is :

A. $CH_2(OH)-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2-CH_3$

B. $H_3C-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH(OH)-CH_3$

C. $H_3C-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2-CH_2(OH)$

D. $H_3C-\underset{\underset{OH}{|}}{\overset{\overset{CH_3}{|}}{C}}-\underset{\underset{CH_3}{|}}{C}-CH_3$

Answer: D

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10. Some meta-directing substituents in aromatic substitution are given which one is the most deactivating?

A. $-SO_3H$

B. $-COOH$

C. $-NO_2$

D. $-C^{\circ}N$

Answer: C

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11. Which of the following compounds will not undergo Friedel $-$ Crafts reaction easily ?

A. Xylene

B. Nitrobenzene

C. Toluene

D. Cumene

Answer: B

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12. The radical,  is aromatic because it has

A. 7 p - orbitals and 6 unpaired electrons

B. 7 p - orbitals and 7 unpaired electrons

C. 6 p - orbitals and 7 unpaired electrons

D. 6 p - orbitals and 6 unpaired electrons

Answer: D

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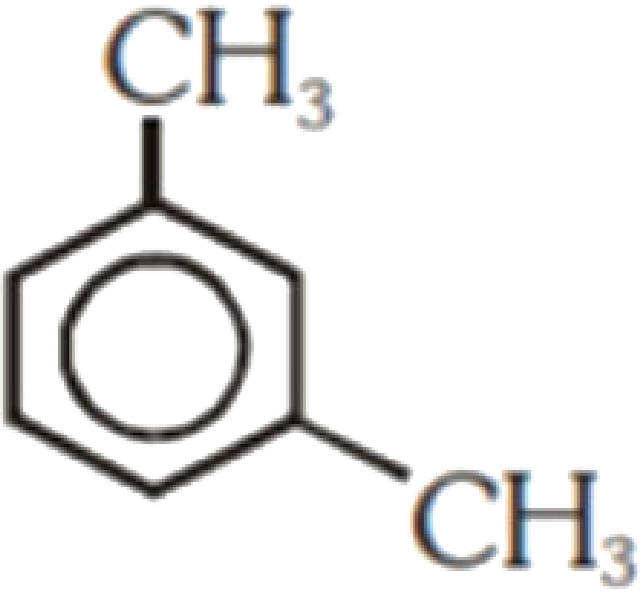
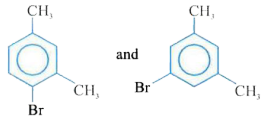
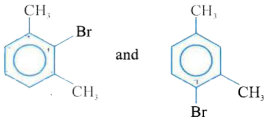
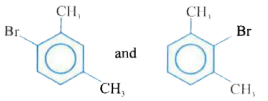
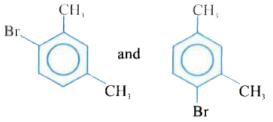
13. What products are formed when the following compounds is treated with Br_2 in the presence of $FeBr_3$?



A. 

B. 

C. 

D. 

Answer: D

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14. $2, 3 -$ Dimethyl$- 2 -$ butene can be prepared by heating which of the following compounds with a strong acid ?

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

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

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

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

Answer: D

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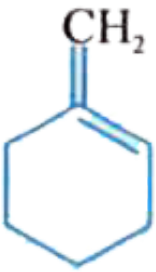
15. In the reaction with HCl, an alkene reacts in accordance with Markownikoff's rule to give a product 1-chloro-1-methylcyclohexane. The possible alkene is:

A. 

(A)

B. 

C. (A) and (B)

D. 

Answer: C

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16. The oxidation of benzene by V_2O_5 in the presence of aire produces

A. benzoic acid

B. benzaldehyde

C. benzoic anhydride

D. maleic anhydride

Answer: D

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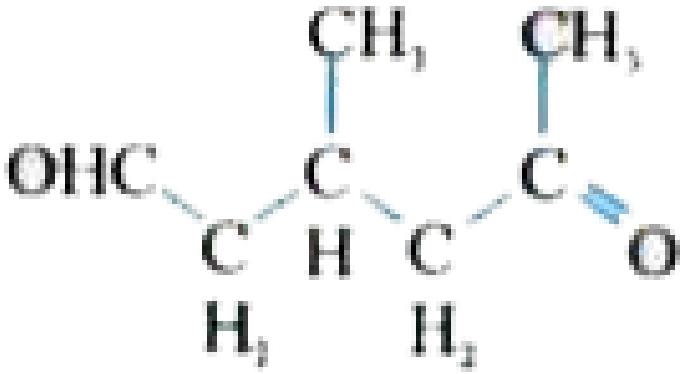
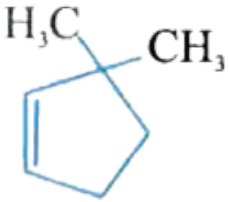
17. A single compound of the structure

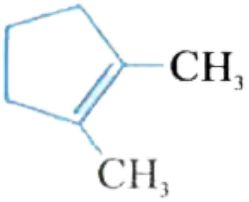


is obtainable from ozonlysis of which of the following cyclic compounds?

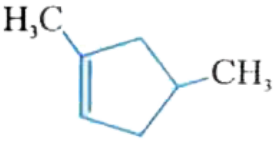
A.

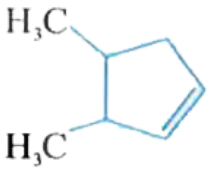


B.



C.





D.

Answer: C

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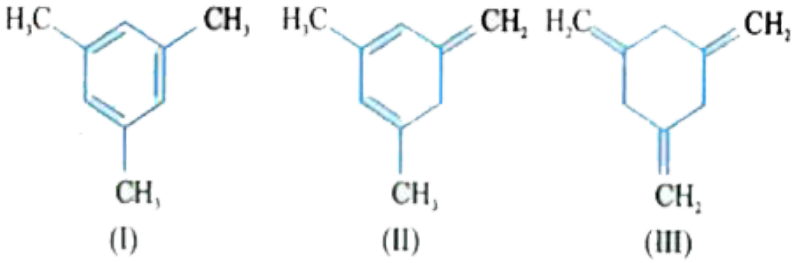
18. Given :



The enthalpy of hydrogenation of these compounds will be in the order as :

A. II gt III gt I

B. II gt I gt III

C. I gt II gt III

D. III gt II gt I

Answer: D

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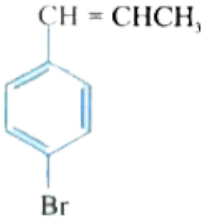
19. The reaction of $C_6H_5CH = CHCH_3$ with HBr produces :

A. $C_6H_5CH_2CH_2Br$

B. 

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

D. $C_6H_5CH_2\underset{Br}{\underset{|}{C}}HCH_3$

Answer: C

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20. Which of the following can beused as the halide component for friedel-crafts reaction?

A. Chloroethene

B. Isopropyl chloridc

C. Chlorobenzene

D. Bromobenzene

Answer: B

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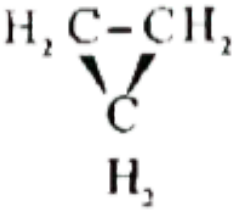
21. Which of the following compounds shall not produce propene by reaction with HBr followed by elimination or direct only elimination reaction?

A. $H_2C = C = O$

B. $H_3C - \overset{H_2}{C} - CH_2Br$



C.

D. $H_3C - \overset{H_2}{C} - CH_2OH$

Answer: A

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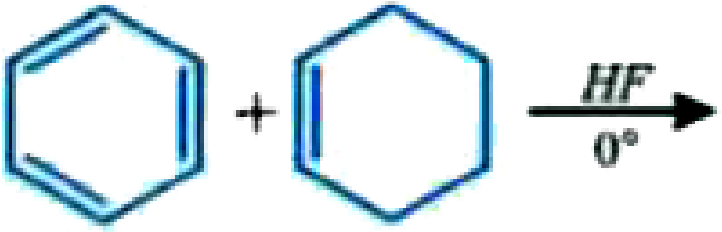
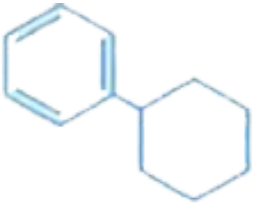
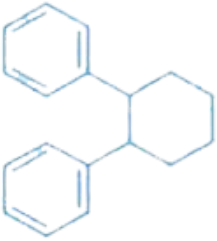
22. In the given reaction

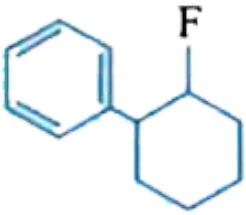


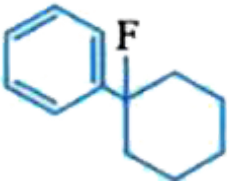
the product P is :-



A.

B. 

C. 

D. 

Answer: A

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23. The compound that will react most readily with gaseous bromine has the formula

A. C_4H_{10}

B. C_2H_4

C. C_3H_6

D. C_2H_6

Answer: C

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24. The correct statement the comparison of staggered and eclipsed conformations of ethan is:

A. The staggered conformation of ethane is less stable than eclipsed conformation, because staggered conformation has torsional strain.

B. The eclipsed conformation of ethane is more stable than staggered conformation, because eclipsed conformation has no torsional strain.

C. The eclipsed conformation of ethane is more stable than staggered conformation even though the eclipsed conformation has torsional strain.

D. The staggered conformation of ethane is more stable than eclipsed conformation, because staggered conformation has no torsional strain.

Answer: D

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25. In the reaction

$$H-C\equiv CH \xrightarrow[(2)\,CH_3CH_2Br]{(1)\,NaNH_2/liq.NH_3} X, \xrightarrow[(2)\,CH_3CH_2Br]{(i)\,NaNH_2/liq.NH_3} Y$$

X and Y are :

A. X = 1 - Butyne , Y = 3 - Hexyne

B. X = 2 - Butyne, Y = 3- Hexyne

C. X = 2 - Butyne , Y = 2- Hexyne

D. X = 1 - Butyne , Y = 2 - Hexyne

Answer: A

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Exercise 4

1. Arrange the following in decreasing order of their boiling points.

(A). N-butane

(B). 2-methylbutane

(C). N-pentane

(D). 2,2-dimethylpropane

A. A $>$ B $>$ C $>$ D

B. B $>$ C $>$ D $>$ A

C. D $>$ C $>$ B $>$ A

D. C > B > D > A

Answer: D

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2. Arrange the halogens F_2, Cl_2, Br_2, I_2, in order of their increasing reactivity with alkanes.

A. $I_2 < Br < Cl_2 < F_2 2$

B. $Br_2 < Cl_2 < F_2 < I_2$

C. $F_2 < Cl_2 < Br_2 < I_2 4$

D. $Br_2 < I_2 < Cl_2 < F_2$

Answer: A

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3. The increasing order of reduction of alkyl halides with zinc and dilute HCl is

A. $R-Cl<R-I<R-Br$

B. $R-Cl<R-Br<R-I$

C. $R-I<R-Br<R-Cl$

D. $R-Br<R-I<R-Cl$

Answer: B

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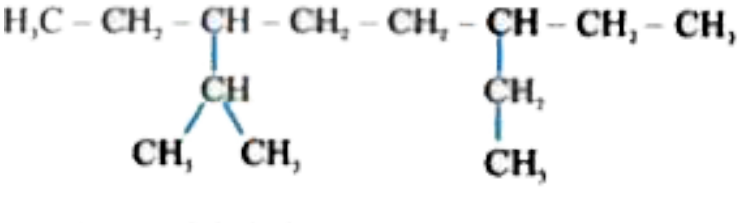
4. The correct IUPAC name of the following alkane is



A. 3, 6- Diethyl -2- methyloctane

B. 5 - Isopropyl -3- ethyloctane

C. 3 - Ethyl -5- isopropyloctane

D. 3 - Isopropyl -6- ethyloctane

Answer: A

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5. Arrange the following hydrogen halides in order of their decreasing reactivity with propene.

A. $HCl > HBr > HI$

B. $HBr > HI > HCl$

C. $HI > HBr > HCl$

D. $HCl > HI > HBr$

Answer: D

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6. Arrange the following carbanions in order of their decreasing stability.

A) $H_3C - C \equiv C^-$

B) $H - C \equiv C^-$

C) $H_3C - C\overline{H}_2$

A. $A > B > C$

B. $B > A > C$

C. $C > B > A$

D. $C > A > B$

Answer: B

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7. Which of the following reactions of methane is incomplete combustion:

A. $2CH_4 + O_2 \xrightarrow{Cu\,/\,523K\,/\,100\ \text{atm}} 2CH_3OH$

B. $CH_4 + O_2 \xrightarrow{Mo_2O_3} HCHO + H_2O$

C. $CH_4 + O_2 \rightarrow C(s) + 2H_2O(l)$

D. $CH_4 + 2O_2 \rightarrow CO_2(g) + 2H_2O(l)$

Answer: C

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8. Some oxidation reactions of methane are given below. Which of them is/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. $2CH_4(g) + O_2(g) \xrightarrow{Cu\,/\,523\,/\,100atm} 2CH_2OH$

Answer: C::D

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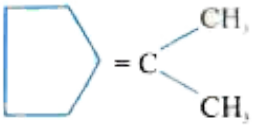
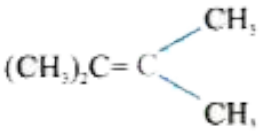
9. Which of the following alkenes on ozonolysis give a mixture of ketones only?

A. $CH_3 - CH = CH - CH_3$

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

C. 

D. 

Answer: C::D

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10. Which are the correct IUPAC names of the following compound?

A. 5 - Butyl -4- isopropyldecane

B. 5 - Ethyl -4- propyldecane

C. 5 - sec - Butyl -4- iso - propyldecane

D. 4 - (1- methylethyl) -5- (1- methylpropyl) - decane

Answer: C::D

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11. For an electrophilic substitution reaction , the presence of a halogen atom in the benzene ring .....

A. deactivates the ring by inductive effect

B. deactivates the ring by resonance

C. increases the charge density at ortho and para position relative to meta position by resonance

D. directs the incomong electrophile to meta position by increasing the charge density relative to ortho and para position.

Answer: A::C

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12. In an electrophilic substitution reaction of nitrobenzene, the presence of nitro group _____.

A. deactives the ring by inductive effect.

B. activates the ring by inductive effect.

C. decreases the charge density at ortho and para position of the ring relative to meta position by resonance.

D. None of the above

Answer: A::C

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13. Which of the following are correct?

A. $CH_3 - O - CH_2^{\oplus}$ is more stable than $CH_3 - CH_2^{\oplus}$

B. $(CH_3)_2CH^{\oplus}$ is less stable than $CH_3 - CH_2 - CH_2^{\oplus}$

C. $CH_2 = CH - CH_2^{\oplus}$ is more stable than $CH_3 - CH_2 - CH_2^{\oplus}$

D. $CH_2 = CH^{\oplus}$ is more stable than $CH_3 - CH_2^{\oplus}$

Answer: A::C

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14. The molecules having dipole moment are :

A. 2, 2 - Dimethylpropane

B. trans - Pent -2- ene

C. cis - Hex -3- ene

D. 2, 2, 3, 3 - Tetramethylbutane.

Answer: B::C

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15. Match the reagent from Column I which on reaction with $CH_3 - CH = CH_2$ gives some product given in Column II as per the codes given below

	Column I		Column II
A.	O_3 / Zn + H_2O	1.	Acetic acid and CO_2
B.	$KMnO_4$ / H^+	2.	Propan-1-ol
C.	$KMnO_4$ / OH^-	3.	Propan-2-ol
D.	H_2O / H^+	4.	Acetaldehyde and formaldehyde
E.	B_2H_6 / $NaOH^+$ and H_2O_2	5.	Propane-1, 2-diol

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16. Match the hydrocarbons in column I with the boiling points given in column II.

Column I	Column II
(i). n-Pentane	(a). 282.5 K
(ii). iso-Pentane	(b). 309 K
(iii). neo-Pentane	(c). 301 K

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17. Match the following reactants in Column I with the corresponding reaction products in Column II.

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18. Match the reactions given in Column I with the reaction types in Column II.

Column I	Column II
$(i) CH_2 = CH_2 + H_2O \xrightarrow{H^+} CH_3CH_2OH$	(a) Hydrogenation
$(ii) CH_2 = CH_2 + H_2 \xrightarrow{pd} CH_3 - CH_3$	(b) Halogenation
$(iii) CH_2 = CH_2 + Cl_2 \rightarrow Cl - CH_2 - CH_2 - Cl$	(c)Hydration
$(iv) 3CH \equiv CH \xrightarrow[\text{Heat}]{\text{Cutube}} C_6H_6$	(d) Hydration
	(e) Condensation

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