# Miscellaneous Exercise Question Bank

**1.** Anti-Markownikoff addition of HBr is not observed in :

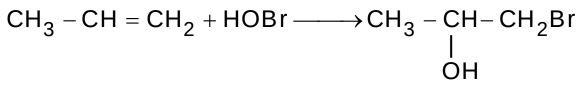
**(A)** Propene **(B)** 1-Butene **(C)** But-2-ene **(D)** Pent-2-ene

**2.** Which of the following proceed by free radical mechanism ?

**(A)** $Cl_3C-CH=CH_2+HCl \longrightarrow Cl_3C-CH_2CH_2Cl$

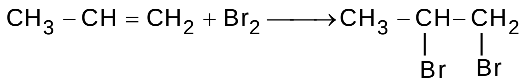
**(B)** $CH_3-CH=CH_2+HBr \xrightarrow[\text{peroxide}]{} CH_3CH_2CH_2Br$

**(C)**



$CH_3-CH=CH_2+HOBr \longrightarrow CH_3-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2Br$

**(D)**



$CH_3-CH=CH_2+Br_2 \longrightarrow CH_3-\underset{\displaystyle Br}{\underset{|}{CH}}-\underset{\displaystyle Br}{\underset{|}{CH_2}}$

**3.** The products formed by the oxidative ozonolysis hydrolysis of a compound having formula $C_5H_8$ are $CH_3-CH_2-CH_2-COOH$ and $CO_2$ . The compound is :

**(A)** pent-1-yne **(B)** pent-2-yne **(C)** pent-1, 4-diene **(D)** penta-1, 3-diene

**4.** When acetylene reacted with hydrochloric acid in presence of $HgCl_2$ the product obtained is :

**(A)** Methyl chloride **(B)** Acetaldehyde

**(C)** Vinyl chloride **(D)** Methanol

**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)** Propanol

**6.** Which one of the following does not dissolve in conc. $H_2SO_4$?

**(A)** $CH_3-C\equiv C-CH_3$ **(B)** $CH_3-CH_2-C\equiv CH$

**(C)** $CH\equiv CH$ **(D)** $CH_2=CH_2$

**7.** Which one of the following compounds will give in the presence of peroxide a product different from that obtained in the absence of peroxide?

**(A)** 1-butane **(B)** 1-butene, HBr **(C)** 2-butene, HCl **(D)** 2-butene, HBr

**8.** Which of the following alkene on acid catalysed hydration form 2-methyl propan-2-ol?

**(A)** $(CH_3)_2C=CH_2$ **(B)** $CH_3-CH=CH_2$

**(C)** $CH_3-CH=CH-CH_3$ **(D)** $CH_3-CH_2-CH=CH_2$

**9.** Which of the following compounds yields only one product on monobromination?

**(A)** Neopentane **(B)** Toluene **(C)** Phenol **(D)** Aniline

**10.** Aqueous solution of the following compounds are electrolysed. Aromatic compound is obtained from

**(A)** Sodium benzoate **(B)** Sodium maleate

**(C)** Sodium succinate **(D)** Both **(A)** and **(B)**

**11.** Dehydration of butan-2-ol with conc. $H_2SO_4$ gives preferred product :

**(A)** but-1-ene **(B)** but-2-ene

**(C)** propene **(D)** ethane

**12.** $CH_3 - C \equiv C - CH_3 \xrightarrow{NaNH_2}$ 'X'. What is X ?

**(A)** $CH_3CH_2CH = CH_2$

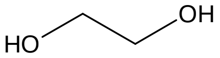
**(B)** $CH_3CH_2C \equiv CH$

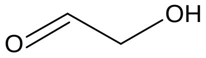
**(C)** $CH_3 - CH = CH - CH_3$

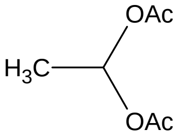
**(D)** $CH_2 = C = CH - CH_3$

**13.** Identify the compound 'Y' in the following sequence of reaction :

$$HC \equiv CH \xrightarrow[\text{ii) } H_2O/Zn]{\text{i) } O_3} X \xrightarrow{Zn/CH_3COOH} Y$$

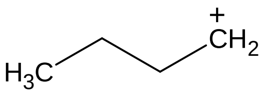
**(A)**


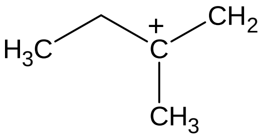
**(B)**


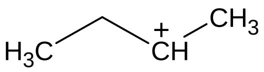
**(C)**


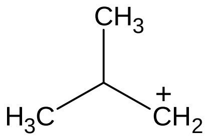
**(D)** $CH_3COOH$

**14.** Dehydration of 1-butanol gives 2-butene as a major product. By which of the following intermediates the compound 2-butene is obtained ?

**(A)**


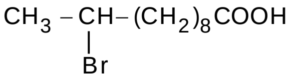
**(B)**


**(C)**


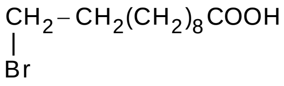
**(D)**


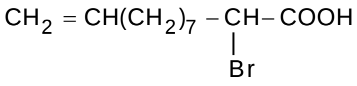
**15.** The principal organic compound formed in the reaction :

$CH_2 = CH(CH_2)_8COOH + HBr \xrightarrow{\text{Peroxide}}$ ............ Is

**(A)**

$CH_3 - \underset{\displaystyle Br}{\underset{|}{C}}H - (CH_2)_8COOH$

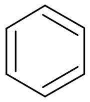
**(B)** $CH_2 = CH(CH_2)_8COBr$

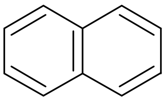
**(C)**

$\underset{\displaystyle Br}{\underset{|}{C}}H_2 - CH_2(CH_2)_8COOH$

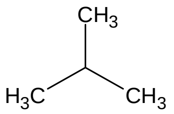
**(D)**

$CH_2 = CH(CH_2)_7 - \underset{\displaystyle Br}{\underset{|}{C}}H - COOH$

**16.** The compound most likely to decolourise a solution of potassium permanganate is :

**(A)** $H_2C = CH_2$

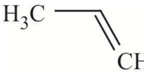
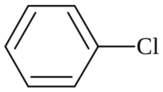
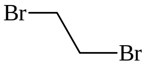
**(B)**


**(C)**


**(D)**


## Matrix-Match Type

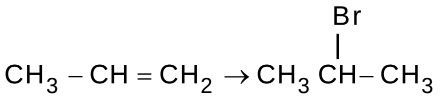
**17.** From the given sets, match appropriately.

| Column – I | | Column – II | |
|---|---|---|---|
| **(A)** |  $+ (RCO)_2O_2 + HBr$ | **(p)** | Free radical mechanism |
| **(B)** |  $+ Cl_2 + FeCl_3$ | **(q)** | Elimination |
| **(C)** | $H_3C\equiv CH + HCl$ | **(r)** | Electrophilic substitution |
| **(D)** |  $+ NaNH_2$ | **(s)** | Electrophilic addition |

**18.** With respect to the starting material, $CH_2 = CH - CH_3$, choose the type of reaction with respect to the reagents.

| Column- I | | Column- I | |
|---|---|---|---|
| **(A)** | $KMnO_4/H_2O$ | **(p)** | Anti-Markovnikov addition |
| **(B)** | $Br_2$ | **(q)** | Oxidative cleavage |
| **(C)** | $HBr/R_2O_2$ | **(r)** | Syn addition |
| **(D)** | Hot $KMnO_4/H^+$ | **(s)** | Anti-addition |

**19.** Match Column I with Column II and select the correct answer :

| Column – I (Reaction) | | Column – II (Reagent) | |
|---|---|---|---|
| **(A)** |  $CH_3-CH=CH_2 \rightarrow CH_3\underset{}{\overset{Br}{\overset{\vert}{C}}}H-CH_3$ | **(p)** | HBr |
| **(B)** | $CH_3-CH = CH_2 \rightarrow CH_3 - CH_2 - CH_2Br$ | **(q)** | NBS |
| **(C)** | $CH_3 - CH = CH_2 \rightarrow BrCH_2 - CH = CH_2$ | **(r)** | $Br_2$ / $CCl_4$ |
| **(D)** | $CH_3 - CH = CH_2 \rightarrow CH_3 - CHBr - CH_2Br$ | **(s)** | HBr (peroxide) |

**Paragraph for Question No. 20 to 23**

Chlorination of methane involves three steps: chain-initiating, chain-propagating and chain-terminating.

$$Cl_2 \xrightarrow{\text{Heat or light}} 2\dot{C}l \qquad \text{Chain initiating}$$

$$\left.\begin{array}{l} CH_4 + Cl^{\bullet} \longrightarrow \dot{C}H_3 + HCl \\ CH_3^{\bullet} + Cl_2 \longrightarrow CH_3Cl + \dot{C}l \end{array}\right] \text{Chain propagating}$$

When oxygen is passed through the reaction mixture, chlorination of methane slows down temporarily

**20.** Chain-propagating steps :

**(A)** consume reactive species and form another reactive species

**(B)** do not produce reactive species

**(C)** absorb energy and produce reactive species

**(D)** are not always the part of chain-reaction mechanism

**21.** Chain-terminating step may involve the formation of :

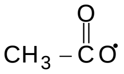
**(A)** Chlorine **(B)** Methyl chloride **(C)** Ethane **(D)** All the three

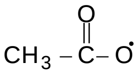
**22.** Although chlorination of methane is an exothermic reaction, the reaction requires high temperature because :

**(A)** Activation energy is low **(B)** heat of reaction is negative

**(C)** Chain-initiating step is endothermic **(D)** Chain-terminating step is endothermic

**23.** Temporary slow down of chlorination of methane in presence of oxygen in due to the formation of :

**(A)** 
$CH_3-\overset{\overset{O}{\parallel}}{C}\dot{O}$ which is highly unstable and decomposes easily

**(B)** 
$CH_3-\overset{\overset{O}{\parallel}}{C}-\dot{O}$ which is less reactive than $^{\bullet}CH_3$

**(C)** $ClO^{\bullet}$ which is highly reactive

**(D)** a diradical $ClO^{\bullet}$

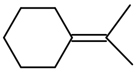
**Paragraph for Question No. 24 to 28**

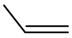
Hydrogenation of alkenes and alkynes takes place in presence of certain catalysts. In Sabatier Senderen's reaction, the addition of hydrogen takes place in presence of Raney nickel catalyst. Platinum and palladium can also be used catalyst in these reactions. These are heterogeneous catalyst and used in finely divided state. Experimentally, it is observed that less crowded alkenes absorb $H_2$ with faster rate. Controlled hydrogenation of alkyne in presence of Lindlar's catalyst yields cis product i.e., 'cis' alkene. Thus, in presence of Lindlar's catalyst 'syn' addition takes place. The relative rate of hydrogenation follows the order

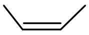
$$-C\equiv C- > \rangle C=C\langle > \rangle C=O > C_6H_6$$

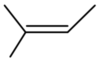
Non-terminal alkynes are reduced in presence of Na or Li metal dissolved in liquid ammonia. In this reaction, anti-addition of hydrogen results into the trans-product.

**24.** The relative rate of catalytic hydrogenation of following alkenes is:


(I)


(II)


(III)


(IV)

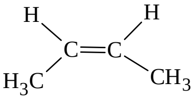
**(A)** II > III> IV > I **(B)** I > IV > III > II

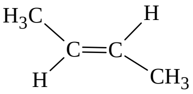
**(C)** III > IV > I > II **(D)** II > IV > I > III

**25.** $CH_3-C\equiv C-CH_3+H_2 \xrightarrow[\text{Boiling Quinoline}]{Pd/CaCO_3} (A)$

The product **(A)** will be

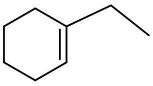
**(A)** $CH_3CH_2CH_2CH_3$

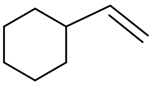
**(B)** 

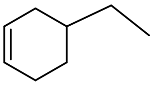
**(C)** 

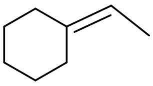
**(D)** $CH_3-CH_2-CH=CH_2$

**26.** In which of the following cases, the hydrogenation reaction is most exothermic?

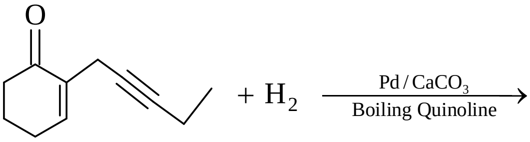
**(A)** 

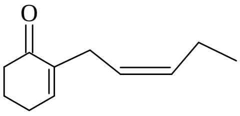
**(B)** 

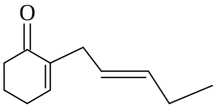
**(C)** 

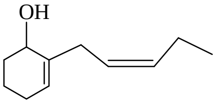
**(D)** 

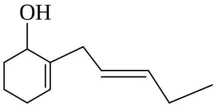
**27.** The product of the following reaction is :



**(A)** 

**(B)** 

**(C)** 

**(D)** 

**28.** Powdered nickel is more effective than granular nickel because :

**(A)** Surface area of powdered nickel is maximum

**(B)** Surface area of powdered nickel is minimum

**(C)** Powdered nickel increases the activation energy of the reaction

**(D)** Powdered nickel increases the intermolecular collision of reactant molecules

**Paragraph for Question No. 29 to 32**

By virtue of its shape 's' orbitals can attract electron density more than 'p' orbitals. More the 's' character more is the electronegativity of the hybrid orbitals. Order of electronegativity of hybrid orbitals is $sp > sp^2 > sp^3$.

**29.** Which is acidic?

**(A)** $H_3C—C \equiv C—CH_3$ **(B)** $CH_2 = CH_2$ **(C)** $H_3C — C \equiv C—H$ **(D)** $C_2H_6$

**30.** Acetylene reacts with sodium hypochlorite to form

**(A)** vinyl chloride **(B)** dichloro acetylene

**(C)** sodium acetylide **(D)** chloro ethane

**31.** Acetylene reacts with sodium and methyl iodide and produces

**(A)** 2-butyne **(B)** 1-butyne

**(C)** 1-pentyne **(D)** 2-pentyne

**32.** 1-butyne and 2-butyne can be distinguished by

**(A)** $Br_2$ in $CCl_4$ **(B)** Tollen's reagent

**(C)** Schiff's reagent **(D)** 2, 4-DNP

**33.** The products obtained via oxymercuration ($HgSO_4 + H_2SO_4$) of 1–butyne would be

**(A)** $CH_3 – CH_2 – CO – CH_3$ **(B)** $CH_3 – CH_2 – CH_2 – CHO$

**(C)** $CH_3 – CH_2 – CHO + HCHO$ **(D)** $CH_3 – CH_2 – COOH + HCOOH$

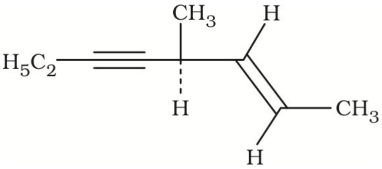
**34.** 1,2–dibromopropane on treatment with X moles of $NaNH_2$ followed by treatment with ethyl bromide gave a pentyne, the value of X is

**(A)** one **(B)** two **(C)** three **(D)** four

**35.** $(CH_3)_3CMgCl$ on reaction with $D_2O$ produces

**(A)** $(CH_3)_3CD$ **(B)** $(CH_3)_3COD$ **(C)** $(CD)_3CD$ **(D)** $(CD_3)_3COD$

**36.**

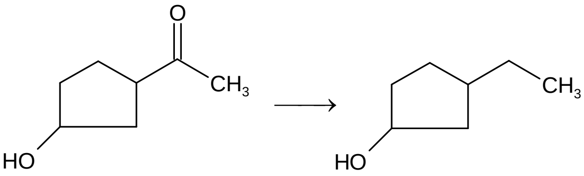


Hydrogenation of the above compound in the presence of poisoned palladium catalyst gives

**(A)** an optically active compound **(B)** an optically inactive compound

**(C)** a racemic mixture **(D)** a diastereomeric mixture

**37.** The appropriate reagent for the following transformation.



**(A)** Zn(Hg), HCl **(B)** $NH_2 - NH_2 / OH^-$ **(C)** $H_2/Ni$ **(D)** $NaBH_4$

**38.** Ozonolysis of 2,3–dimethylbut–1–ene followed by reduction with zinc and water gives

**(A)** methanoic acid and 3–methyl–2–butanone

**(B)** methanal and 3–methyl–2–butanone

**(C)** methanal and 2–methyl–3–butanone

**(D)** methanoic acid and 2–methyl–3–butanone

**Paragraph for Question No. 39 to 43**

Adolf von Bayer suggested that, since carbon prefers to have tetrahedral geometry with bond angles of approximately 109°, ring sizes other than five and six may be too strained to exist. Baeyer based his hypothesis on the simple geometrical notion that a three-membered ring (cyclopropane) should be an equilateral triangle with bond angles of 60°, a four membered ring (cyclobutane) should be a square with bond angles of 90° and so on. According to Baeyer's analysis, cyclopropane, with a bond angle compression of $109° - 60° = 49°$, should have a large amount of angle strain and must therefore be highly reactive. Cyclohexane becomes puckered to relieve its strain. The angular deviation of cycloalkane is (–11°). Greater is the angular deviation more is the torsional strain.

**Answer the following questions :**

**39.** Which of the following is most reactive cycloalkane ?

**(A)** Cyclopropane **(B)** Cyclobutane **(C)** Cyclopentane **(D)** Cyclohexane

**40.** Which among the following is most strained cycloalkane ?

**(A)** Cyclopropane **(B)** Cyclobutane **(C)** Cyclopentane **(D)** Cyclohexane

**41.** The tendency of cyclopropane (I), cyclobutane (II) and cyclopentane (III) to form addition compounds is in the order :

**(A)** I > II > III **(B)** I = II > III **(C)** I > II = III **(D)** I = III > II

**42.** Which among the following have greatest bond angle ?

**(A)** Cyclopropane **(B)** Cyclobutane **(C)** Cyclopentane **(D)** Cyclohexane

**43.** Which of the following cycloalkanes has zero strain energy ?

**(A)** Cyclopropane **(B)** Cyclobutane

**(C)** Cyclopentane **(D)** Cyclohexane

**44.** An alkane with the formula, $C_6H_{14}$ can be prepared by the hydrogenation of only two alkanes ($C_6H_{12}$). IUPAC name of the alkane is :

**(A)** 2, 2-dimethylbutane **(B)** 2, 3-dimethylbutane
**(C)** 2-methylpentane **(D)** n-hexane

**45.** A hydrocarbon with formula $C_8H_{18}$ gives one monochloro derivative. The hydrocarbon is :

**(A)** n-octane **(B)** 2-methylheptane
**(C)** 2, 2, 4-trimethylpentane **(D)** 2, 2, 3, 3-tetramethylbutane

**46.** A fuel has the same knocking property as a mixture of 70% iso-octane (2, 2, 4-trimethylpentane) and 30% n-heptane by volume. The octane number of a fuel is :

**(A)** 70 **(B)** 40 **(C)** 100 **(D)** 50

**47.** When n-hexane is passed over $Cr_2O_3 / Al_2O_3$ at 873 K, _______ is formed.

**(A)** hexane **(B)** hexyne **(C)** benzene **(D)** 1-hexene

**48.** The number of different substitution products possible when bromine and ethane are allowed to react is :

**(A)** 6 **(B)** 8 **(C)** 7 **(D)** 9

**49.** Which of the following alkane can be synthesised in good yields by the Wurtz reaction ?

**(A)** $(CH_3)_2CH-CH_2-CH(CH_3)_2$ **(B)** $(CH_3)_2CH-CH_2CH_2-CH(CH_3)_2$
**(C)** $CH_3CH_2-C(CH_3)_2-CH_2CH_3$ **(D)** $(CH_3)_3C-CH_2-CH_2-CH_3$

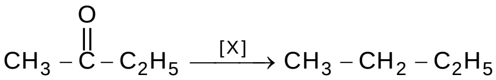
**50.** The best method for the preparation of 2, 2-dimethylbutane is via the reaction of :

**(A)** $Me_3CBr$ and $MeCH_2Br$ in Na/ether **(B)** $(Me_3C)_2CuLi$ and $MeCH_2Br$
**(C)** $(MeCH_2)_2CuLi$ and $Me_3CBr$ **(D)** $Me_3CMgI$ and $MeCH_2I$

**51.** When n-hexane is heated with anhydrous $AlCl_3$ and HCl gas, the major product obtained is :

**(A)** 1-chlorohexane **(B)** 2-chlorohexane
**(C)** 3-chlorohexane **(D)** mixture of 2-methylpentane and 3-methylbutane

**52.** In the given reaction,



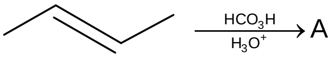
$$CH_3-\overset{\overset{O}{\|}}{C}-C_2H_5 \xrightarrow{[X]} CH_3-CH_2-C_2H_5$$

X will be :

**(A)** $LiAlH_4$ **(B)** $NaBH_4$ **(C)** $Bu_3SnH$ **(D)** $NH_2-NH_2/OH^-$

**Paragraph for Question No. 53 to 57**

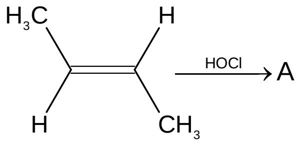
The addition of bromine to cyclopentene provides evidence for bromonium ion intermediate in bromine addition. It follows ionic mechanism. When cyclopentene reacts with bromine in presence of $CCl_4$, anti addition occurs and gives trans isomer. So, addition of halogen to an alkene is a stereospecific reaction.

**53.** 

A is

**(A)** 2, 3-epoxy butane **(B)** 2, 3-butane diol
**(C)** 2–butanone **(D)** epoxy ethane

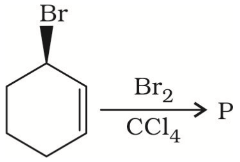
**54.**



Intermediate formed is :

| | | | |
|---|---|---|---|
| **(A)** | hydroxonium ion | **(B)** | chloronium ion |
| **(C)** | hydronium ion | **(D)** | None of the above |

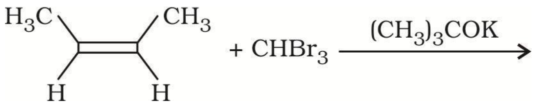
**55.**



Product P is :

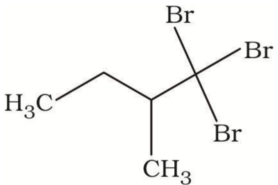
| | | | |
|---|---|---|---|
| **(A)** | Racemic mixture | **(B)** | Diastereomeric mixture |
| **(C)** | Meso compound | **(D)** | None of these |

**56.** Consider the following reaction:

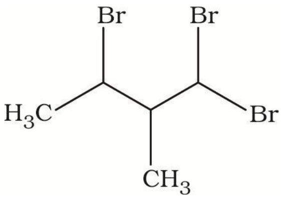


The product obtained in the reaction is

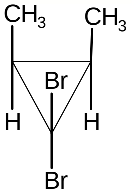
**(A)**



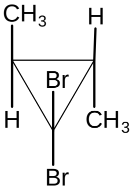
**(B)**



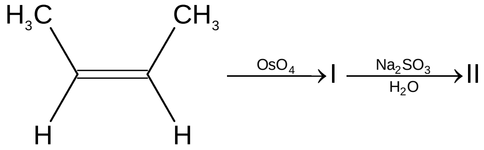
**(C)**



**(D)**



**57.**



The final product is

| | | | |
|---|---|---|---|
| **(A)** | Meso 2, 3 –butane diol | **(B)** | 2–butanol |
| **(C)** | ± 2, 3 –butane diol | **(D)** | 2–butanone |

**58.** The compound with highest boiling point is

**(A)** n-hexane

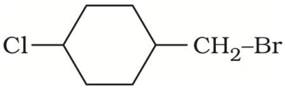
**(B)** n-pentane

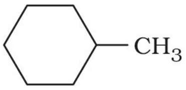
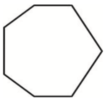
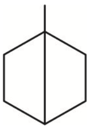
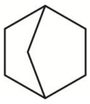
**(C)** 2, 2-dimethyl propane

**(D)** 2-methylbutane

**59.** The treatment of $CH_2I_2$ / Zn – Cu with ethene produces

**(A)** propene **(B)** cyclopropane **(C)** propyne **(D)** cyclopropene

**60.** What would be the product formed when  reacts with two equivalents of metallic sodium in ether?

**(A)**  **(B)**  **(C)**  **(D)** 

**61.** Which of the following is most reactive with NBS / $CCl_4$ ?

**(A)** $C_6H_5CH_3$

**(B)** $C_6H_5CH_2CH_2CH_3$

**(C)** $C_6H_5CH_2 - CH = CH_2$

**(D)** $C_6H_5 - CH(CH_3) - CH = CH_2$

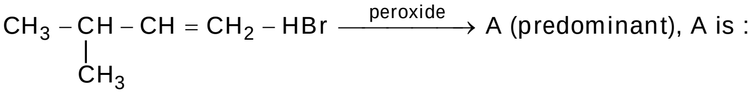
**62.** $CH_2 = CH - CH = CH_2 \xrightarrow[\text{1 equiv.}]{H_2 / Pt} A \xrightarrow{O_3 / H_2O} B$. A and B are :

**(A)** $CH_3 - CH_2 - CH = CH_2$, $(CH_3CH_2COOH + CO_2)$

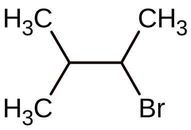
**(B)** $CH_3 - CH = CH - CH_3$, $CH_3COOH$ (2 mol)

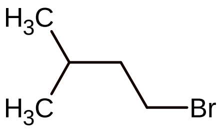
**(C)** $CH_3 - CH = CH - CH_3$, $CH_3CHO$ (2 mol)

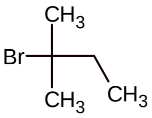
**(D)** $CH_3 - CH_2 - CH = CH_2$, $(CH_3CH_2CHO + HCHO)$

**63.** 

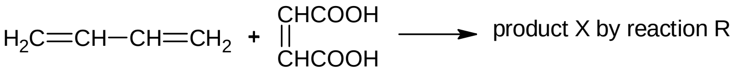
$\underset{\displaystyle CH_3}{\underset{|}{CH_3 - CH}} - CH = CH_2 - HBr \xrightarrow{\text{peroxide}}$ A (predominant), A is :

**(A)** 

**(B)** 

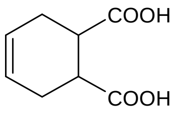
**(C)** 

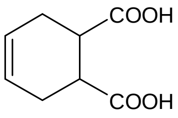
**(D)** None of the above

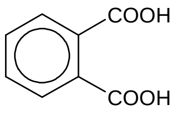
**64.** 

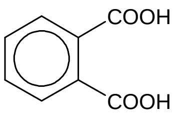
$H_2C{=}CH{-}CH{=}CH_2 + \begin{matrix} CHCOOH \\ \| \\ CHCOOH \end{matrix} \longrightarrow$ product X by reaction R

X and R are:

**(A)**  , Diels Alder

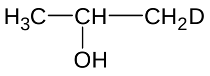
**(B)**  , Friedel-Crafts

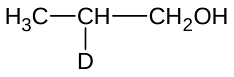
**(C)**  , Diels Alder

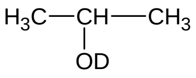
**(D)**  , Friedel-Crafts

**65.** $CH_3CH=CH_2 \xrightarrow[2.\ H_2O_2\ /\ OH]{1.\ BD_3\ /\ THF}$ product X

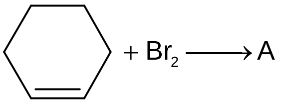
X is:

**(A)** 
$H_3C-\underset{OH}{CH}-CH_2D$

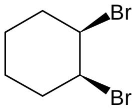
**(B)** 
$H_3C-\underset{D}{CH}-CH_2OH$

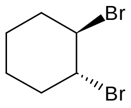
**(C)** 
$H_3C-\underset{OD}{CH}-CH_3$

**(D)** none of the above

**66.** 

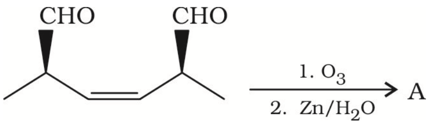
A will have configuration:

**(A)** 

**(B)** 

**(C)** Both are true

**(D)** none of the above

**67.**  A is:

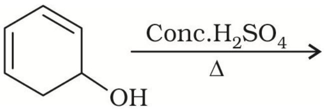
**(A)** optically active

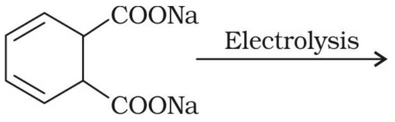
**(B)** optically inactive

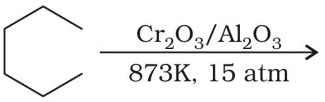
**(C)** on Clemnensen reduction form optically active compound

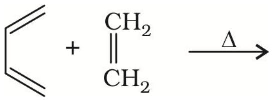
**(D)** none of the above

**68.** Which of the following reaction produces aromatic hydrocarbon ?

**(A)** 

**(C)** 

**(C)** 

**(D)** 

***69.** Which of the following produce meso isomer on reaction with cyclohexene ?

**(A)** $Br_2\ /\ CCl_4$ **(B)** $D_2\ /\ Pt$ **(C)** Cold alk.$KMnO_4$ **(D)** $H_2\ /\ Pt$

**70.** How many chiral compounds are possible on monochlorination of 3-ethylpentene?

**(A)** 2 **(B)** 4 **(C)** 6 **(D)** 8

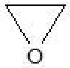
**Paragraph for Question No. 71 to 75**

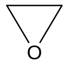
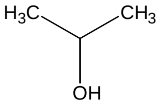
Alkenes can be oxidized in presence of different reagents to give different products. Alkenes on oxidation in presence of silver oxide at high temperature gives cyclic ethers, which also can be synthesized by using peroxo acids. Alkenes on reductive ozonolysis gives carbonyl compounds in presence of zinc and peroxide. On reaction with acidic $KMnO_4$, it also produces corresponding carbonyl compound. Alkynes can also be oxidized in presence of such reagents but the products are different.

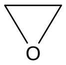
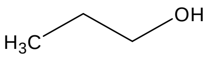
**71.** Cyclohexene is allowed to react with ozone and subsequently with $H_2O_2$ and water. The product formed is

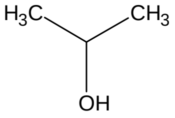
**(A)** oxalic acid **(B)** malonic acid **(C)** succinic acid **(D)** adipic acid

**72.** Ethene on reaction with mCPBA in $CH_2Cl_2$ forms a compound (A), which on subsequent hydrolysis gives a compound (B). (A) and (B) are, respectively

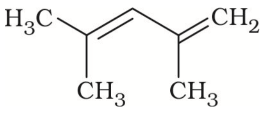
**(A)**  and 

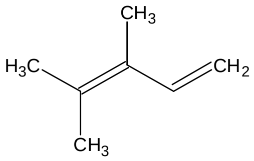
**(B)**  and 

**(C)**  and 

**(D)** $H_3C-CHO$ and 

**73.** An open chain hydrocarbon ($C_7H_{12}$), on reductive ozonolysis produces propanone, methanal and 2–oxopropanal. The hydrocarbon could be

**(A)** 

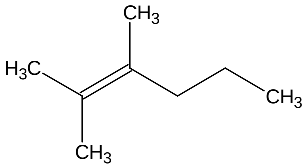
**(B)** 

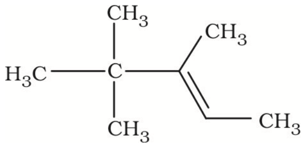
**(C)** Either of these

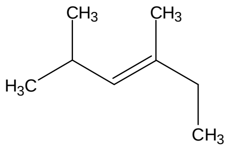
**(D)** None of the above

**74.** A hydrocarbon ($C_8H_{16}$), on oxidation with hot acidified solution of $KMnO_4$ forms 2–butanone and isobutyric acid. The hydrocarbon is

**(A)** $(CH_3)_2C = C(CH_2CH_3)_2$

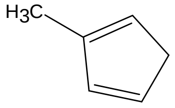
**(B)** 

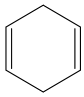
**(C)** 

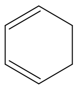
**(D)** 

**75.** A hydrocarbon ($C_6H_8$) absorbs two moles of hydrogen in the presence of a platinum catalyst. The reduction product is inert to bromine and $KMnO_4$ solution. The hydrocarbon on ozonolysis produces malonic acid only. The structure of hydrocarbon is

**(A)** $CH_2 = CH - CH = CH - CH = CH_2$

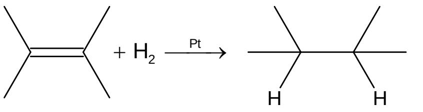
**(B)** 

**(C)** 

**(D)** 

**Paragraph for Question No. 76 – 78**

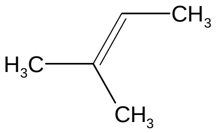
The cis and trans isomers of alkene do not have the same stability. The stability can be measured by hydrogenation and combustion. The reaction of alkene with hydrogen is exothermic and the enthalpy change in the reaction is called heat of hydrogenation.

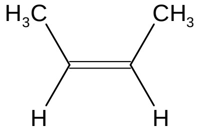


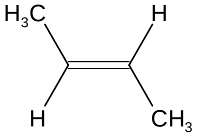
$\Delta H = -120\,kJ/mol$

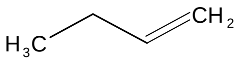
In all the isomers of 2–butene, the product is same but different amount of heat is evolved. In each reaction, it must be related with different relative stability. 1–butene evolves greatest amount of energy and trans–2–butene evolves least amount of energy. So, 1–butene must have greatest energy and it is least stable whereas trans–2–butene must have lowest energy and it is more stable. cis–2–butene has intermediate energy in relation to above.

**76.** Which alkene is most stable?

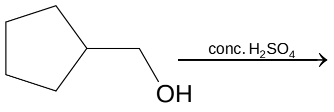
**(A)** 

**(B)** 

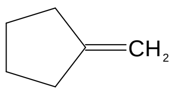
**(C)** 

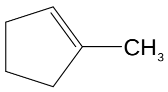
**(D)** 

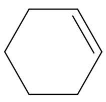
**77.** For the reaction,

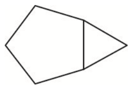


the major product is

**(A)** 

**(B)** 

**(C)** 

**(D)** 

**78.** **Assertion:** According to Saytzeff rule, alkene which consists of more substituted alkyl groups will be more stable.

**Reason:** This stability can be explained by hyperconjugation. As the number of alkyl group increases, it also increases number of hyperconjugation structures.

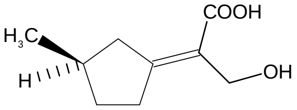
**(A)** Reason is correct explanation of assertion

**(B)** Assertion is correct but reason is not correct

**(C)** Reason and assertion both are wrong

**(D)** None of the above

**79.** In the compound,



The configuration at the chiral centre and the double bond are, respectively,

**(A)** R and E **(B)** R and Z **(C)** S and Z **(D)** S and E

**80.** The relative rate of addition of HCl to the following compounds follows the order:

**(A)** $CH_2 = CHCOOH > CH_2 = CH_2 > CH_3 - CH = CH_2 > (CH_3)_2C = CH_2$

**(B)** $(CH_3)_2C = CH_2 > CH_3 - CH = CH_2 > CH_2 = CH_2 > CH_2 = CH - COOH$

**(C)** $CH_2 = CH_2 > CH_3 - CH = CH_2 > CH_2 = CH - COOH > (CH_3)_2C = CH_2$

**(D)** $CH_3 - CH = CH_2 > CH_2 = CH - COOH > (CH_3)_2C = CH_2 > CH_2 = CH_2$

***81.** Which of the following compound(s) will give a white precipitate, when the compound is treated with hot alkaline $KMnO_4$ and the evolved gas is passed into lime water solution?

**(A)** $CH_3CH_2CH = CH - CH_3$ **(B)** $(CH_3)_2CH - CH = CH_2$

**(C)** $(CH_3)_2C = CH - CH_3$ **(D)** $CH_3CH_2CH_2CH = CH_2$

***82.** The Grignard reagent derived from which of the following compounds on treatment with water give the same alkane

**(A)** $CH_3CH_2CH_2CH_2Cl$ **(B)** $CH_3CH_2CHClCH_3$

**(C)** $(CH_3)_3CCl$ **(D)** $(CH_3)_2CHCH_2Cl$

***83.** Which of the following compounds on decarboxylation with sodalime gives toluene?

**(A)** Phenylacetic acid **(B)** o–Toluic acid

**(C)** m–Toluic acid **(D)** p–Toluic acid

***84.** Baeyer's reagent is used in the laboratory for

**(A)** detection of double bond **(B)** reduction process

**(C)** oxidation process **(D)** detection of glucose

***85.** Which of the following compounds have finite dipole moment?

**(A)** trans–2–pentene **(B)** cis–2–pentene **(C)** 1–Butyne **(D)** 2–Butyne

***86.** An unsaturated hydrocarbon on ozonolysis gives one mole each of methanal, ethanal and 2–ketopropanal. The structure of the hydrocarbon is

**(A)** $CH_2 = CH - CH = CHCH_3$ **(B)** $CH_3CH = CH - CH = CHCH_3$

**(C)** $CH_2 = C(CH_3) - CH = CHCH_3$ **(D)** $CH_2 = CH - C(CH_3) = CHCH_3$

**87.** Which of the following on reductive ozonolysis will give only glyoxal?

**(A)** Cyclobutadiene **(B)** Benzene **(C)** Toluene **(D)** Ethyne

**88.** Which of the following can be used in Friedel–Crafts acylation reactions?

**(A)** $(CH_2CO)_2O$ **(B)** $CH_3COOCH_3$ **(C)** $CH_3Cl$ **(D)** $CH_3CH_2COCl$

**89.** Which of the following alkenes on treatment with HBr in presence or absence of peroxide give the same product ?

**(A)** Cyclohexene **(B)** But–2–ene

**(C)** Hex–3–ene **(D)** Ethene

**90.** Which of the following undergo electrophilic substitution reactions faster than benzene ?

| | | | |
|---|---|---|---|
| **(A)** | Phenol | **(B)** | Aniline |
| **(C)** | Toluene | **(D)** | Chlorobenzene |

**91.** Methane can be prepared by

| | | | |
|---|---|---|---|
| **(A)** | Wurtz reaction | **(B)** | Decarboxylation |
| **(C)** | Hydrogenation | **(D)** | Alkyl magnesium bromide |

**92.** The molecules that will have dipole moment are

| | | | |
|---|---|---|---|
| **(A)** | 2,2–dimethylpropane | **(B)** | trans–2–pentene |
| **(C)** | Azzulene | **(D)** | 2,2,3,3–tetramethylbutane |

**Reasoning Type**

**(A)** Statement–1 is True, Statement– 2 is True; Statement–2 is a correct explanation for Statement–1

**(B)** Statement – 1 is True, Statement– 2 is True; Statement – 2 is NOT a correct explanation for Statement– 1

**(C)** Statement – 1 is True, Statement – 2 is False

**(D)** Statement – 1 is False, Statement – 2 is True

**93.** **Statement-1:** Boiling point of alkanes increases with increase in molecular weight.

**Statement-2:** Van der Waal's forces increase with increase in molecular weight.

**94.** **Statement-1:** Iodination of alkanes is reversible.

**Statement-2:** Iodination is carried out in presence of iodic acid.

**95.** **Statement-1:** Acetylene does not react with NaOH.

**Statement-2:** Acetylene has sp hybridization.

**96.** **Statement-1:** Concentrated $H_2SO_4$ is used to dry ethane and not ethylene.

**Statement-2:** Concentrated $H_2SO_4$ is a dehydrating agent.

**97.** **Statement-1:** Freezing point of neopentane is more than n- pentane.

**Statement-2:** Increase in van der Waal's forces increases freezing point.

**98.** **Statement-1:** Methane cannot be obtained by Wurtz reaction.

**Statement-2:** Wurtz reaction leads to the formation of symmetrical alkane having an even number of carbon atoms.

**99.** **Statement-1:** Trans-pent-2-ene is polar but trans-but-2-ene is non-polar.

**Statement-2:** The polarity of cis isomer is more than trans which are either non-polar or less polar.

**100.** **Statement-1:** Iodination of alkane takes place in presence of HgO or $HIO_3$.

**Statement-2:** Iodination is very slow and reversible process.