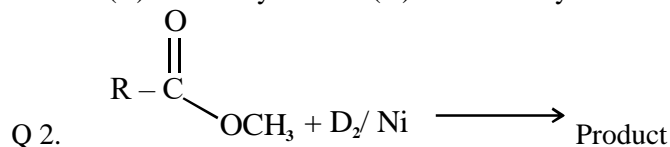


Hydrocarbon – Alkane

1. Preparation of Alkane – Hydrogenation

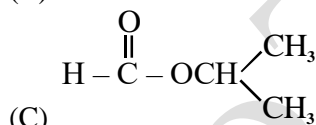
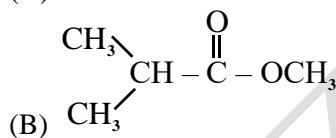
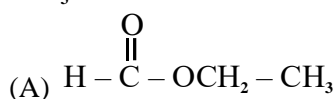
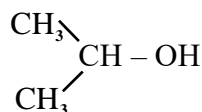
Reaction

- Q 1. Which of the following is homogeneous catalyst?
 (A) Lindlar catalyst (B) willkinson's catalyst
 (C) P-2 catalyst (D) Adaur catalyst



The product formed is

- (A) $\text{R}-\text{CH}_2\text{OD} + \text{CH}_3\text{OD}$
 (B) $\text{R}-\text{CD}_2\text{OD} + \text{CH}_3\text{OD}$
 (C) $\text{R}-\text{CD}_2\text{OH} + \text{CH}_3\text{OD}$
 (D) $\text{R}-\text{CD}_2\text{OD} + \text{CD}_3\text{OH}$
- Q 3. Which of the following ester are hydrogenation with Ni/H_2 produces CH_3OH &

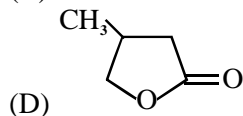
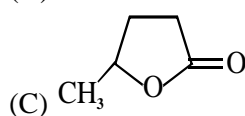
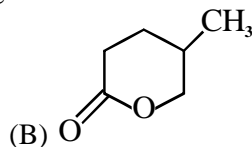
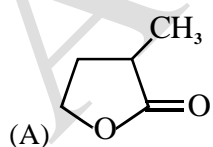


(D) None of these

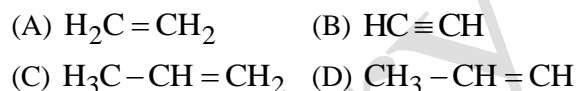
- Q 4. Which of the following ester form



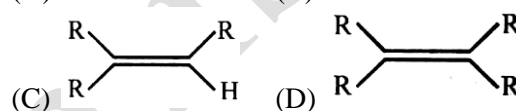
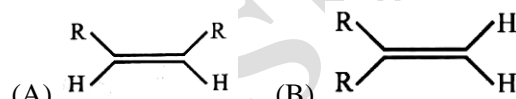
on hydrogenation with Ni/H_2



- Q 5. Which of the following is more reactive towards Ni/H_2 ?

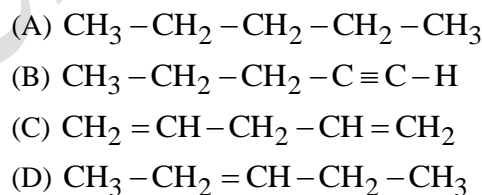


- Q 6. Which one of the following will react fastest with H_2 under catalytic hydrogenation condition?

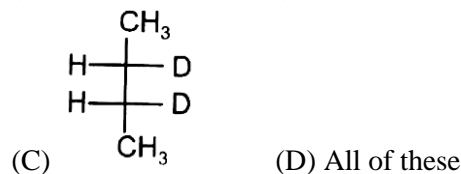
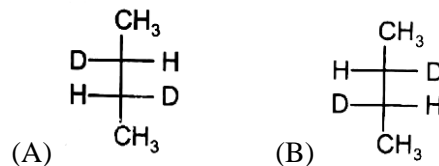


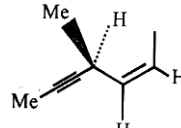
- Q 7.
$$\text{CH}_2=\text{CH}-\text{CH}_2-\text{C}\equiv\text{C}-\text{H} \xrightarrow[\text{(1.eq.)}]{\text{H}_2/\text{Ni}}$$

Product (A). A would be

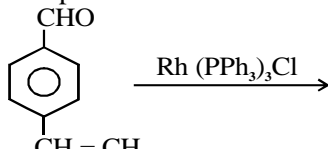
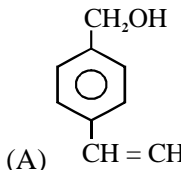
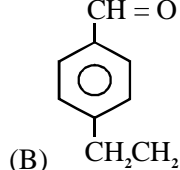
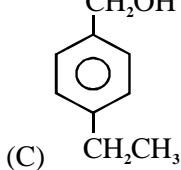
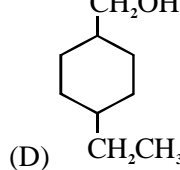
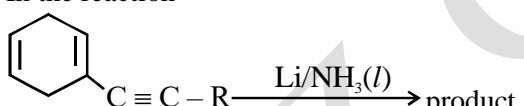
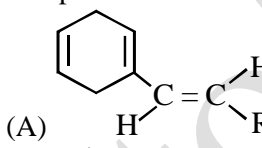
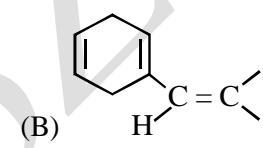
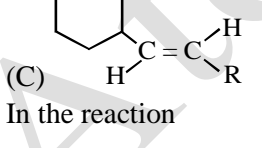
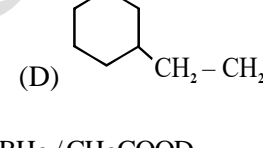


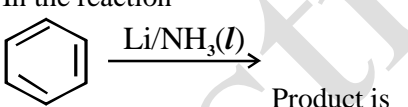
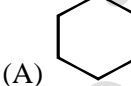
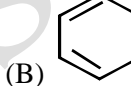
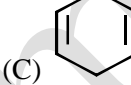
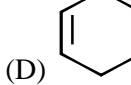
- Q 8.
$$\begin{array}{c} \text{CH}_3 \\ \diagdown \\ \text{C}=\text{C} \\ \diagup \\ \text{D} \end{array} \xrightarrow{\text{H}_2, \text{Ni}} \text{Product}$$



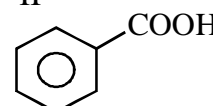
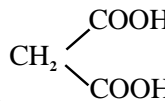
- Q 9. 

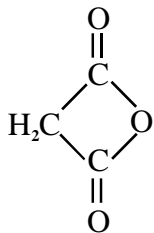
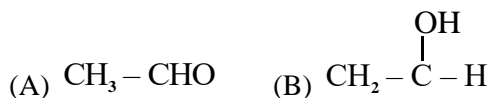
Hydrogenation of the above compound in the presence of poisoned palladium catalyst gives
 (A) an optically active compound
 (B) an optically inactive compound

- (C) a racemic mixture
(D) a diastereomeric mixture
- Q 10. The product formed in the reaction
- 
- (A)  (B) 
- (C)  (D) 
- Q 11. $R-CH=CH-CH=CH_2 \xrightarrow{Li/NH_3(l)}$ product. The product formed is
(A) $R-CH=CH-CH_2-CH_3$
(B) $R-CH_2-CH=CH-CH_3$
(C) $R-CH_2-CH_2-CH_2-CH_3$
(D) $R-CH_2-CH_2-CH=CH_2$
- Q 12. In the reaction
- 
- The product is
- (A)  (B) 
- (C)  (D) 
- Q 13. In the reaction
- $CH_3-CH=CH_2 \xrightarrow{BH_3/CH_3COOD}$
- Product is
- (A) $CH_3-\underset{\substack{| \\ D}}{CH}-\underset{\substack{| \\ D}}{CH_2}$ (B) $CH_3-\underset{\substack{| \\ D}}{CH}-CH_3$
(C) $CH_3-CH_2-CH_2D$ (D) $CH_3-CH_2-CH_3$

- Q 14. In the reaction
- $CH_3-CH=CH_2 \xrightarrow{BD_3/CH_3COOH}$
- Product is
- (A) $CH_3-\underset{\substack{| \\ D}}{CH}-CH_3$ (B) $CH_3-CH_2-CH_2D$
(C) $CH_3-\underset{\substack{| \\ D}}{CH}-\underset{\substack{| \\ D}}{CH_2}$ (D) $CH_3-CD_2-CD_3$
- Q 15. In the reaction
- 
- Product is
- (A)  (B) 
- (C)  (D) 
- + Ni/H₂ →
- Q 16. $CH_3-\underset{\substack{| \\ D}}{C}=\underset{\substack{| \\ D}}{C}-C_2H_5$
- Product,
The product formed is
(A) Mose product (B) d-l pair
(C) Anti-addition (D) None of these

2. Preparation of Alkane

- Q 1. The ease of decarboxylation of following acid is
- I $H-COOH$ II CH_3-COOH
- III CH_3-CH_2-COOH IV 
- (A) I > IV > II > III (B) IV > I > II > III
(C) IV > III > II > I (D) I > II > III > IV
- Q 2. The decarboxylation of compound  gives



Q 3. In Kolbe electrolysis, the pH at cathode is (At 25°C)

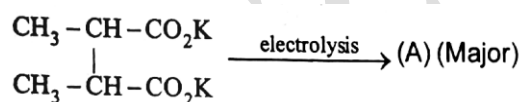
- (A) = 7 (B) < 7
(C) > 7 (D) None of these

Q 4. During the preparation of ethane by Kolbe's electrolytic method using inert electrodes, the pH of the electrolyte

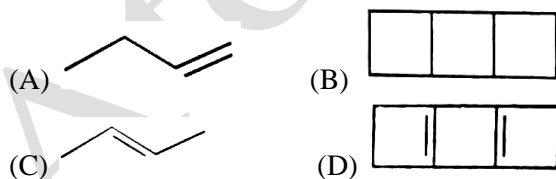
- (A) increase progressively as reaction proceeds
(B) decreases progressively as reaction proceeds
(C) remains constant throughout the reaction
(D) may decrease, if the concentration of the electrolyte is not very high

Q 5. $2\text{CH}_3\text{COONa} + \text{H}_2\text{C} = \text{CH}_2 \xrightarrow[\text{electrolysis}]{\text{Kolbe}}$ product, is

- (A) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$
(B) $\text{CH}_3 - \text{CH} = \text{CH} - \text{CH}_3$
(C) $\text{CH}_3 - \text{CH}_2 - \text{CH}_3$
(D) $\text{CH}_3 - \text{CH}_3$



Q 6. Major product (A) of above reaction



Q 7. The ease of wurtz reaction among alkyl halides is in order

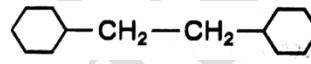
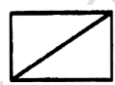
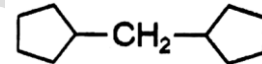
- (A) $\text{RI} > \text{RBr} > \text{RCl} > \text{RF}$
(B) $\text{RI} < \text{RBr} < \text{RCl} < \text{RF}$
(C) $\text{RBr} > \text{RCl} > \text{RI} > \text{RF}$

(D) None of these

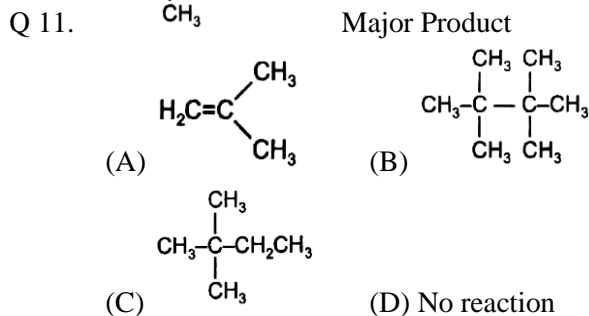
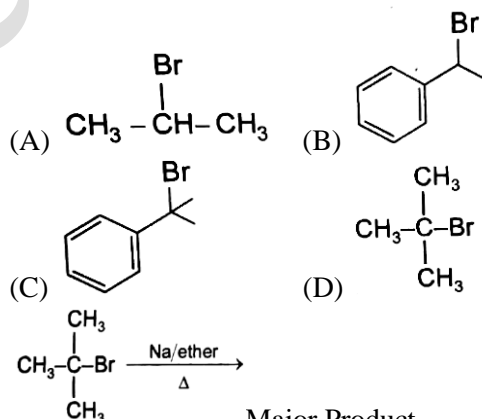
Q 8. Which can be synthesized by Wurtz reactions in good yield?

- (A) $(\text{CH}_3)_3\text{C} - \text{C}(\text{CH}_3)_2$
(B) $(\text{CH}_3)_2\text{CH} - \text{CH}(\text{CH}_3)_2$
(C) $\text{CH}_3 - (\text{CH}_2)_5 - \text{CH}_3$
(D) All of these

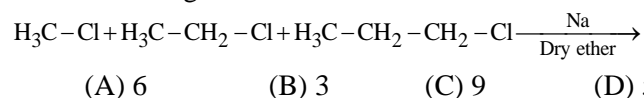
Q 9. Which of the given can not be synthesized by Wurtz reaction?

- (A) $(\text{CH}_3)_2(\text{CH}_2)_2$
(B) 
(C) 
(D) 

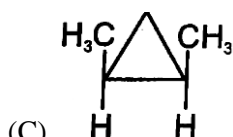
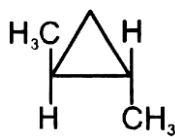
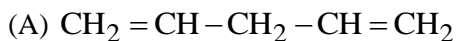
Q 10. Which of the following compounds is most reactive for Wurtz reaction?



Q 12. Find out number of dimerise products obtain by following reaction



Q 13. 2,4 dibromo pentane on reaction with Zn dust gives a major product



(D) All

Q 14. Which of the method is best to prepare alkane?

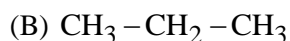
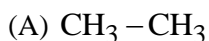
(A) wurtz reaction

(B) frankland reaction

(C) wurtz – fitting reaction

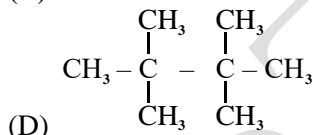
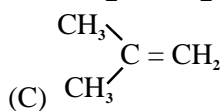
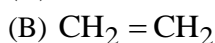
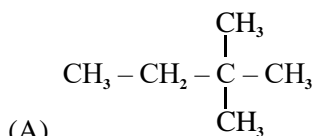
(D) correy house synthesis

Q 15. $\text{CH}_3 - \text{I} \xrightarrow[3. \text{CH}_3 - \text{CH}_2\text{I}]{1. \text{Li} \quad 2. \text{CuI}}$ Product is



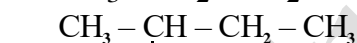
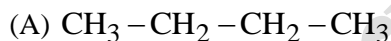
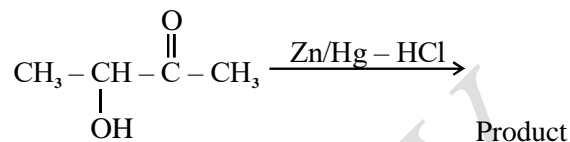
(D) None of these

Q 16. $\text{CH}_3 - \text{CH}_2 - \text{I} \xrightarrow[3. (\text{CH}_3)_3\text{C}^+\text{I}^-]{1. \text{Li} \quad 2. \text{CuI}}$ Product is

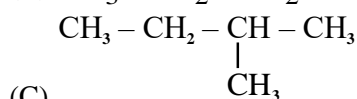
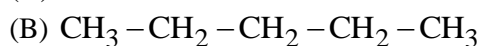
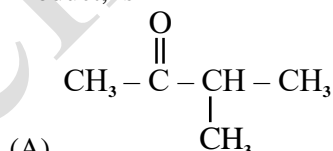
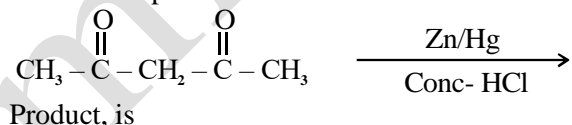


3. Preparation of Alkane

Q 1. Which of the following is correct for the product formation in the reaction?

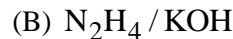
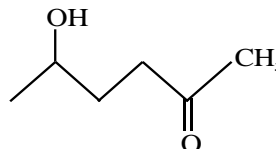


Q 2. The correct product in reaction

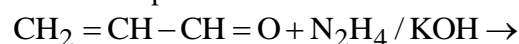


(D) None of these

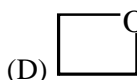
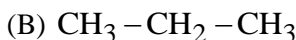
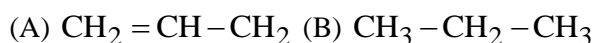
Q 3. Which is best suited for reduction of



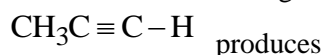
Q 4. The correct product formed in the reaction

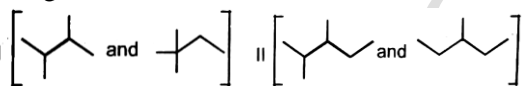
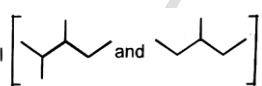
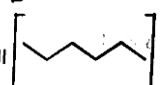
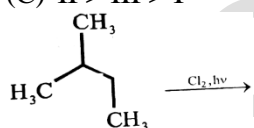


Product is

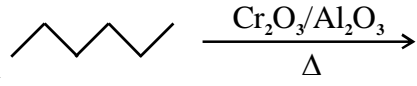
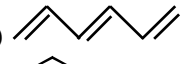




Q 5. The treatment of CH_3MgX with



- (A) $\text{CH}_3-\text{CH}=\text{CH}_2$ (B) $\text{CH}_3\text{C}\equiv\text{C}-\text{CH}_3$
- (C) $\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{CH}_3\text{C}=\text{C}-\text{CH}_3 \end{array}$ (D) CH_4
- Q 6. $\text{R}-\text{mgx} + \text{CH}_3\text{COOH} \rightarrow \text{Product}$,
Product formed is
(A) Alkane (B) Ester
(C) Acid (D) Aldehyde
- Q 7. $\text{CH}_3-\text{CH}_2\text{mgx} + \text{D}_2\text{O} \rightarrow \text{Product}$,
Product formed is
(A) $\text{CH}_3-\text{CH}_2\text{D}$ (B) CH_3-CH_3
(C) CH_3-CD_3 (D) $\text{CH}_3\text{CH}_2\text{OD}$
- Q 8. Marsh gas mainly contains
(A) C_2H_2 (B) CH_4
(C) H_2S (D) CO
- Q 9. The compound with the highest boiling point is
(A) n-hexane (B) n-pentane
(C) 2,2-dimethylpropane (D) 2-methylbutane
- Q 10. Isomers of hexane, based on their branching, can be divided into three distinct classes as shown in the figure
- I  II 
- III 
- The correct order of their boiling point is
(A) I > II > III (B) III > II > I
(C) II > III > I (D) III > I > II
- Q 11. 
N (Isomeric products);
fractional distillation \rightarrow M (Isomeric products)
Identify N and M
(A) 6,4 (B) 6,6
(C) 4,4 (D) 3,3
- Q 12. On mixing a certain alkane with chlorine and irradiating it with ultraviolet light, it forms only one monochloroalkane. This alkane could be
(A) pentane (B) isopentane
(C) neopentane (D) propane
- Q 13. 2-Methylbutane on reacting with bromine in the presence of sunlight gives mainly
(A) 1-bromo-3-methylbutane
(B) 2-bromo-3-methylpentane
(C) 2-bromo-2-methylbutane
(D) 1-bromo-2-methylbutane
- Q 14. In the reaction
$$\text{R}-\text{H} \xrightarrow[\Delta]{\text{H}_2/\text{Light}} \text{R}-\text{X} + \text{HX}$$

The correct order of reactivity is
(A) $3^\circ\text{R}-\text{H} > 2^\circ\text{R}-\text{H} > 1^\circ\text{R}-\text{H}$
(B) $1^\circ\text{R}-\text{H} > 2^\circ\text{R}-\text{H} > 3^\circ\text{R}-\text{H}$
(C) $1^\circ\text{R}-\text{H} < 3^\circ\text{R}-\text{H} < 2^\circ\text{R}-\text{H}$
(D) Equal in all cases
- Q 15. In the reaction
$$\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_3 \xrightarrow{\text{Cl}_2/h\nu} \text{A} + \text{B}$$

The relative absorption of H-atom with chlorination is 5.0 : 3.8 : 1. The percentage distribution of A & B are
(A) 28% & 72% (B) 38% & 62%
(C) 48% & 52% (D) None of these
- Q 16. The % yield of mono-chlorinated product A would be
(A) 70.58% (B) 29.40%
(C) 68.5% (D) 54.54%
- Q 17. The correct order of octane no. of the fuel is
Straight Chain parafins Branched chain parafins
I Olifins II Aromatic
III III IV
(A) I > II > III > IV (B) IV > III > II > I
(C) II > III > IV > I (D) II > I > III > IV
- Q 18. In the reaction 
(A)  (B) 
(C)  (D) $\equiv - - - \equiv$
- Q 19. When Alkane is heated at very high temperature in absence of air, the products formed are
(A) Alkene, Alkane (B) Alkanes
(C) Alkenes (D) Alkynes

4. Properties of Alkane

- Q 1. Both methane and ethane may be obtained by a suitable one step reaction from
 (A) CH_3I (B) $\text{CH}_3\text{CH}_2\text{I}$
 (C) CH_3OH (D) $\text{C}_2\text{H}_5\text{OH}$
- Q 2. When water vapours are passed over aluminium carbide, we get
 (A) acetaldehyde (B) ethylene
 (C) methane (D) methyl alcohol
- Q 3. Ethane can be prepared by
 (A) heating sodalime with sodium acetate
 (B) electrolysis of sodium acetate
 (C) electrolysis of sodium acetate
 (D) all of these
- Q 4. Kerosene is a mixture of
 (A) aromatic hydrocarbons
 (B) aliphatic hydrocarbons
 (C) saturated hydrocarbons
 (D) alicyclic hydrocarbons
- Q 5. Which of the following substances is used as antiknock compound ?
 (A) TEL (B) Lead tetrachloride
 (C) Lead acetate (D) $\text{C}_2\text{H}_5\text{PbCl}$
- Q 6. Iso-octane is added to petrol
 (A) to precipitate inorganic material
 (B) to prevent freezing of petrol
 (C) to increase the boiling point
 (D) as an antiknocking agent
- Q 7. Which of the following compounds has been given an octane number of 100?
 (A) n-Hexane (B) Iso-octane
 (C) Neopentane (D) Neo-octane
- Q 8. The reaction conditions leading to best yields of $\text{C}_2\text{H}_5\text{Cl}$ are
 (A) $\text{C}_2\text{H}_6(\text{excess}) + \text{Cl}_2 \xrightarrow{\text{UV light}}$
 (B) $\text{C}_2\text{H}_6 + \text{Cl}_2 \xrightarrow[\text{room temp}]{\text{Dark}}$
 (C) $\text{C}_2\text{H}_6 + \text{Cl}_2(\text{excess}) \xrightarrow{\text{UV light}}$
 (D) $\text{C}_2\text{H}_6 + \text{Cl}_2 \xrightarrow{\text{UV light}}$
- Q 9. n-Heptane on heating to 773 K at 10–20 atm. Pressure in the presence of V_2O_5 and Al_2O_3 gives
 (A) benzene (B) 2-heptene
 (C) toluene (D) cycloheptane
- Q 10. Isobutyl magnesium bromide with dry ether and absolute alcohol gives
 (A) $(\text{CH}_3)_2\text{CH}-\text{CH}_2\text{OH}$ & $\text{CH}_3\text{CH}_2\text{MgBr}$
 (B) $(\text{CH}_3)_2\text{CHCH}_2\text{CH}_2\text{CH}_3$ & $\text{Mg}(\text{OH})\text{Br}$
 (C) $(\text{CH}_3)_2\text{CH}_2, \text{H}_2\text{C}=\text{CH}_2$ & $\text{Mg}(\text{OH})\text{Br}$
 (D) $(\text{CH}_3)_3\text{CH}$ & $\text{CH}_3\text{CH}_2\text{OMgBr}$
- Q 11. Consider the following reaction,

$$\begin{array}{c} \text{CH}_3-\text{CH}-\text{CH}-\text{CH}_3 + \dot{\text{B}}\text{r} \longrightarrow \text{X} + \text{HBr} \\ | \quad | \\ \text{D} \quad \text{CH}_3 \end{array}$$
 Identify the structure of major product X:
 (A) $\begin{array}{c} \text{CH}_3-\text{CH}-\text{CH}-\dot{\text{C}}\text{H}_2 \\ | \quad | \\ \text{D} \quad \text{CH}_3 \end{array}$ (B) $\begin{array}{c} \text{CH}_3-\text{CH}-\dot{\text{C}}-\text{CH}_3 \\ | \quad | \\ \text{D} \quad \text{CH}_3 \end{array}$
 (C) $\begin{array}{c} \text{CH}_3-\dot{\text{C}}-\text{CH}-\text{CH}_3 \\ | \quad | \\ \text{D} \quad \text{CH}_3 \end{array}$ (D) $\begin{array}{c} \text{CH}_3-\dot{\text{C}}\text{H}-\text{CH}-\text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$
- Q 12. Which of the following reactions will not give propane ?
 (A) $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl} \xrightarrow[\text{H}_2\text{O}]{\text{Mg/ether}}$
 (B) $\begin{array}{c} \text{CH}_3-\text{CH}-\text{CH}_3 \\ | \\ \text{OH} \end{array} \xrightarrow{\text{P/HI}}$
 (C) $\text{CH}_3-\text{HC}=\text{CH}_2 \xrightarrow[\text{CH}_3\text{COOH}]{\text{B}_2\text{H}_6}$
 (D) $\text{CH}_3\text{COCl} \xrightarrow[\text{H}_2\text{O}]{\text{CH}_3\text{MgX}}$
- Q 13. $\begin{array}{c} \text{H}_3\text{C} \\ \diagdown \\ \text{CH}-\text{OH} \\ \diagup \\ \text{H}_3\text{C} \end{array} \xrightarrow{\text{P} + \text{Br}_2} \xrightarrow{\text{Na}} \text{X}; \text{X is:}$
 (A) $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3-\text{CH}-\text{CH}_2-\text{CH}_3 \end{array}$ (B) $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3-\text{C}-\text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$
 (C) $\begin{array}{c} \text{H}_3\text{C} \quad \text{CH}_3 \\ \diagdown \quad \diagup \\ \text{CH}-\text{CH} \\ \diagup \quad \diagdown \\ \text{H}_3\text{C} \quad \text{CH}_3 \end{array}$

- (D) $\text{CH}_3-\overset{\text{CH}_3}{\text{CH}}-\text{CH}_2\text{CH}_2\text{CH}_3$
- Q 14. The best method for the preparation of 2,2-dimethylbutane is via the reaction of
 (A) Me_3CBr & MeCH_2Br in Na/ether
 (B) $(\text{Me}_3\text{C})_2\text{CuLi}$ & MeCH_2Br
 (C) $(\text{MeCH}_2)_2\text{CuLi}$ & Me_3CBr
 (D) Me_3CMgI & MeCH_2I
- Q 15. Methane can be converted into ethane by the reactions.
 (A) chlorination followed by the reaction with alcoholic KOH
 (B) chlorination followed by the reaction with aqueous KOH
 (C) chlorination followed by Wurtz reaction
 (D) Chlorination followed by decarboxylation
- Q 16. How many monochloro structural isomers are expected in free radical monochlorination of 2-methylbutane?
 (A) 2 (B) 3 (C) 4 (D) 5
- Q 17. What is the maximum number of carbon atoms in the expected products of the Wurtz reaction?
 $\text{CH}_3-\text{CH}_2\text{Br}$ and $\text{CH}_3-\overset{\text{CH}_3}{\text{CH}}-\text{CH}_2\text{Br}$
 Na + dry ether \downarrow
 Products
 (A) 8 (B) 6 (C) 4 (D) 2
- Q 18. Number of di-substituted isomers of the product of the reaction, $\text{CH}_3\text{CH}_2\text{CH}_3 + \text{Br}_2$, would be
 (A) 2 (B) 5 (C) 3 (D) 4

Answer Key

1. Preparation of Alkane – Hydrogenation Reaction

- | | | |
|---------|---------|---------|
| (1). B | (2). B | (3). C |
| (4). C | (5). B | (6). A |
| (7). C | (8). C | (9). B |
| (10). B | (11). B | (12). A |
| (13). C | (14). A | (15). C |
| (16). B | | |

2. Preparation of Alkane

- | | | |
|---------|---------|---------|
| (1). B | (2). A | (3). C |
| (4). A | (5). A | (6). C |
| (7). A | (8). B | (9). D |
| (10). B | (11). A | (12). D |
| (13). B | (14). D | (15). B |
| (16). C | | |

3. Preparation of Alkane

- | | | |
|---------|---------|---------|
| (1). C | (2). A | (3). B |
| (4). C | (5). D | (6). A |
| (7). A | (8). B | (9). A |
| (10). B | (11). A | (12). C |
| (13). C | (14). A | (15). A |
| (16). D | (17). B | (18). B |
| (19). A | | |

4. Properties of Alkane

- | | | |
|---------|---------|---------|
| (1). A | (2). C | (3). C |
| (4). B | (5). A | (6). D |
| (7). B | (8). A | (9). C |
| (10). D | (11). B | (12). D |
| (13). C | (14). B | (15). C |
| (16). C | (17). A | (18). D |