Q.1 How many moles of O_2 required for complete combustion of one mole of propane –

(A) 7 (B) 5 (C) 16 (D) 10

Q.2 How much volume of air will be needed for complete combustion of 10 lit. of ethane –

(Assuming that approx 20% O_2 is present in air)

(A) 135 lit. (B) 35 lit. (C) 175 lit. (D) 205 lit.

Q.3 During the preparation of ethane by Kolbe's electrolytic method using inert electrodes the pH of the electrolyte –

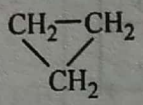
(A) Increases progressively as the reaction proceeds

(B) Decreases progressively as the reaction proceeds

(C) Remains constant throughout the reaction

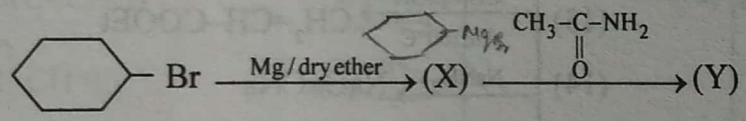
(D) May decrease of the the concentration of the electrolyte is not very high

Q.4 $BrCH_2–CH_2–CH_2Br$ reacts with Na in the presence of ether at 100 °C to produce –

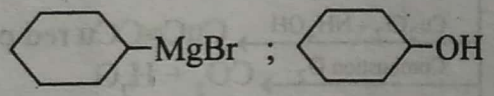
(A) $BrCH_2–CH=CH_2$ (B) $CH_2=C=CH_2$ (C)  (D) All of these

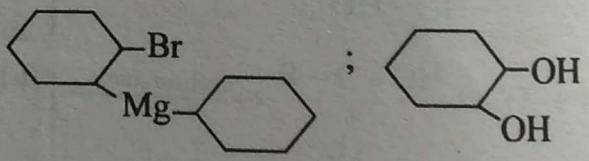
Q.5 How many products will be formed excluding stereo when cis-1,3,5-trimethyl cyclohexene reacts with NBS?

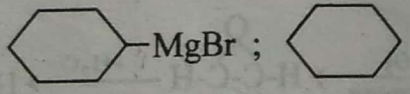
(A) 3 (B) 4 (C) 5 (D) 6

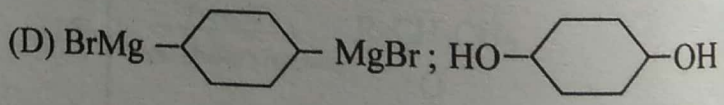
Q.6 

The structures of (X) and (Y) respectively are

(A) 

(B) 

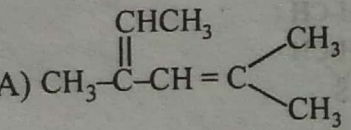
(C) 

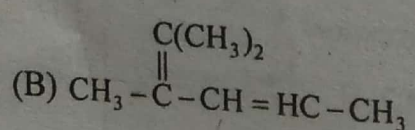
(D) 

Q.7 When n-butane is heated in the presence of $AlCl_3$/HCl it will be converted into –

(A) Ethane (B) Propane (C) Butene (D) Isobutane

Q.8 Alkene A $\xrightarrow{O_3/H_2O}$ $CH_3-\overset{\overset{O}{\|}}{C}-CH_3 + CH_3COOH + CH_3-\underset{\underset{O}{\|}}{C}-COOH$; A can be –

(A) 

(B) 

(C) Both correct (D) None is correct

Q.9 Ethylene forms ethylene chlorohydrin by the action of –

(A) Dry HCl gas (B) Dry chlorine gas

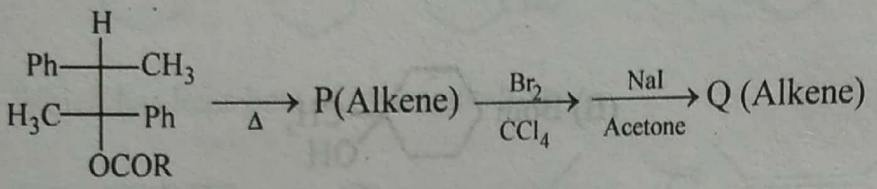
(C) Solution of chlorine gas in water (D) Dilute hydrochloric acid

Q.10 How many dibromo derivatives are formed when bromine is added to 3-Methyl Cyclohexene in 1,2-dichloroethane.

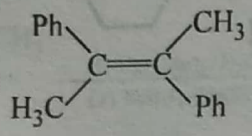
(A) 2 (B) 3 (C) 4 (D) 6

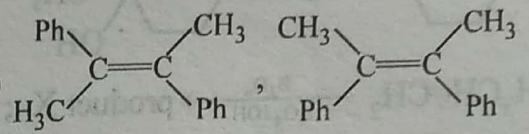
Q.11 When (E)-3-bromo-3-hexene treated with CH_3O^- in CH_3OH. The product formed is :

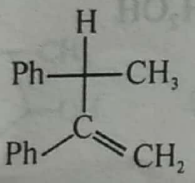
(A) 3-hexyne (B) 2-hexyne (C) 2,3-hexadiene (D) 2,4-hexadiene

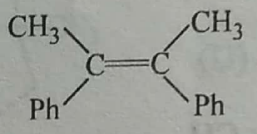
Q.12 

Alkene (P) & (Q) respectively are

(A) Both 

(B) 

(C) Both 

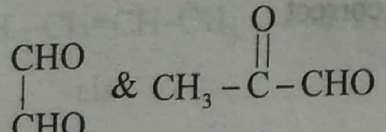
(D) Both 

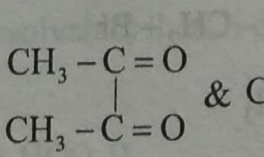
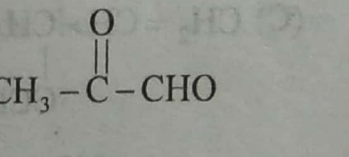
Q.13 Ozonolysis of $CH_3–CH=C=CH_2$ gives

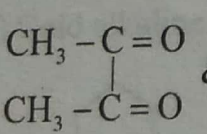
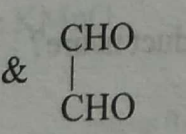
(A) Only CH_3CHO (B) Only HCHO

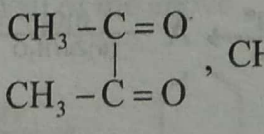
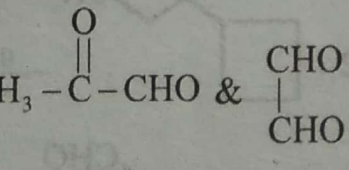
(C) Only CO_2 (D) Mixture of CH_3CHO, HCHO & CO_2

Q.14 O-xylene on ozonolysis gives

(A)  &

(B)  & 

(C)  & 

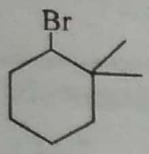
(D)  , 

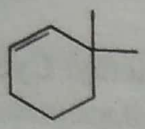
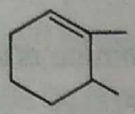
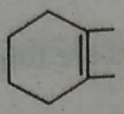
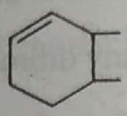
Q.15 The reacting species of alc. KOH is –

(A) OH^- (B) OR^+ (C) OK^+ (D) RO^-

Q.16 Anti–Markownikoff's addition of HBr is not observed in –

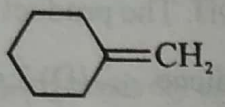
(A) Propene (B) But–2–ene (C) But–1–ene (D) Pent–2–ene

Q.17  $\xrightarrow[\Delta]{\text{alcoholic KOH}}$ Product ; Product is:

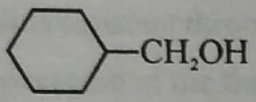
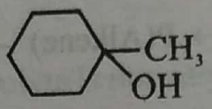
(A)  (B)  (C)  (D) 

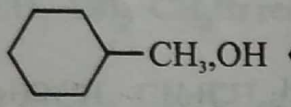
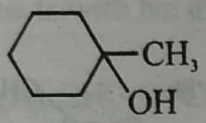
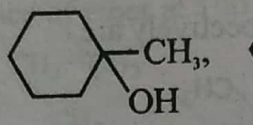
Q.18 Which is expected to react most readily with bromine –

(A) $CH_3CH_2CH_3$ (B) $CH_2=CH_2$ (C) $CH\equiv CH$ (D) $CH_3-CH=CH_2$

Q.19 B $\xleftarrow[H_2O_2/OH^-]{BH_3/THF}$  $\xrightarrow{H_3O^+}$ A

A and B are –

(A) Both  (B) Both 

(C)   (D) 

Q.20 $CH_3CH=CH_2 \xrightarrow[H_2O_2/OH^-]{B_2D_6}$ product X ; X is –

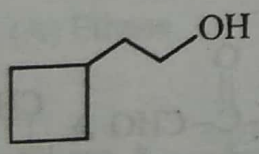
(A) $CH_3-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2D$ (B) $CH_3-\underset{\displaystyle D}{\underset{|}{CH}}-CH_2OH$

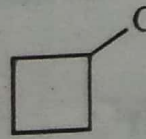
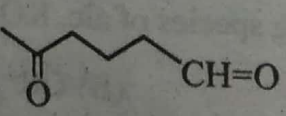
(C) $CH_3-\underset{\displaystyle OD}{\underset{|}{CH}}-CH_3$ (D) none is correct

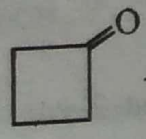
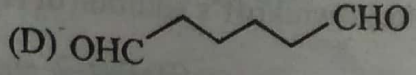
Q.21 $CH_2=CH-CH=CH_2 \xrightarrow[\text{Peroxide}]{CCl_3Br}$ Product. The major product is –

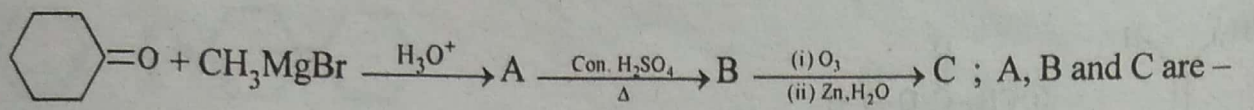
(A) $Br-CH_2-CH=CH-CH_2-CCl_3$ (B) $CH_2=CH-\underset{\displaystyle Br}{\underset{|}{CH}}-CH_2-CCl_3$

(C) $CH_2=CH-\underset{\displaystyle CCl_3}{\underset{|}{CH}}-CH_2-Br$ (D) None is correct

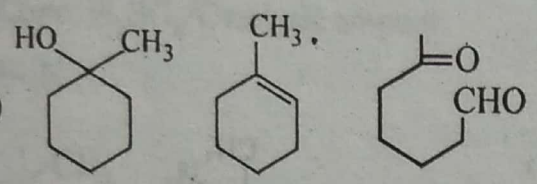
Q.22  $\xrightarrow[\Delta]{H^\oplus}$ A $\xrightarrow[(ii)Zn/H_2O]{(i)O_3}$ Product(s). Product is/are?

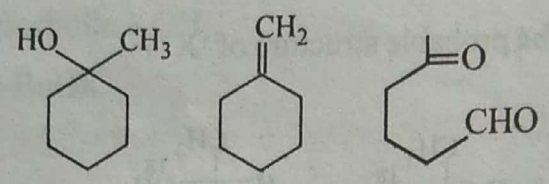
(A)  + HCHO (B) 

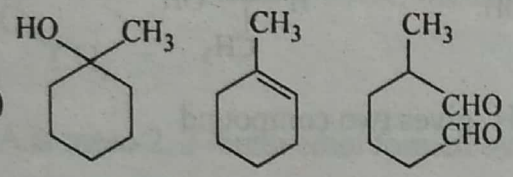
(C)  + CH_3CHO (D) 

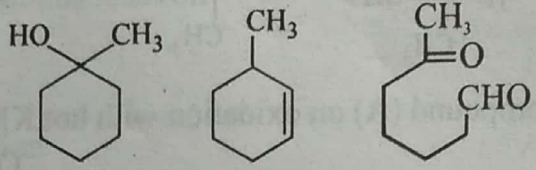
Q.23  ; A, B and C are –

A B C

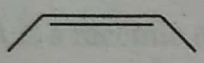
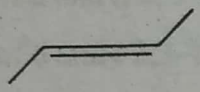
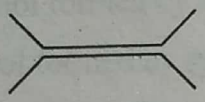
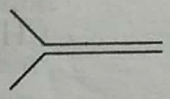
(A) 

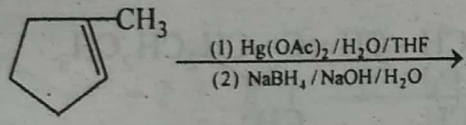
(B) 

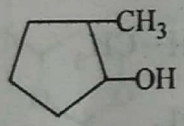
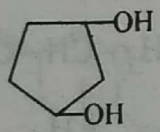
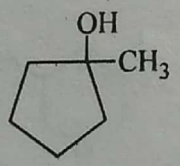
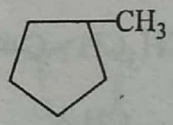
(C) 

(D) 

Q.24 Which has least heat of hydrogenation –

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

Q.25  A. A is –

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

Q.26 For the ionic reaction of hydrochloric acid with the following alkenes, predict the correct sequence of reactivity as measured by reaction rates:

(I) $ClCH=CH_2$ (II) $(CH_3)_2.C=CH_2$ (III) $OHC.CH=CH_2$ (IV) $(NC)_2C=C(CN)_2$

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

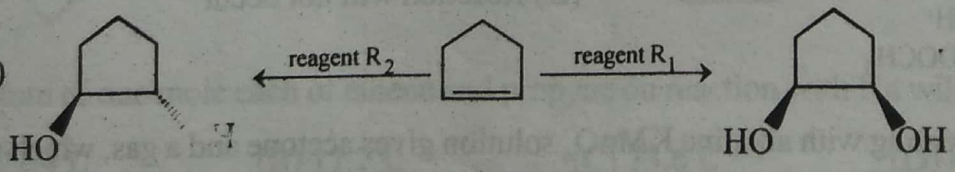
(C) III > II > IV > I (D) II > I > III > IV

Q.27 $CH_3–CH=CH–CH_3 \xrightarrow{X}$ Product is Y (non–resolvable) then X can be –

cis

(A) Br_2 water (B) HCO_3H

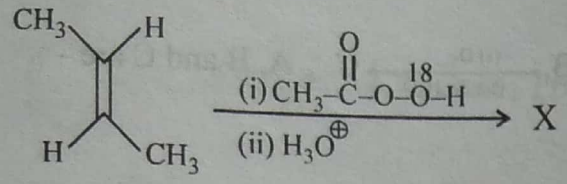
(C) Cold alkaline $KMnO_4$ (D) all of the above

Q.28 (±) 

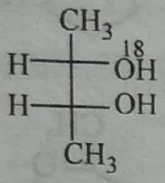
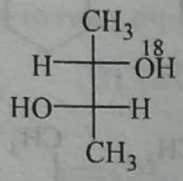
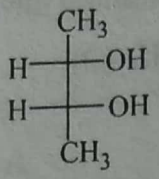
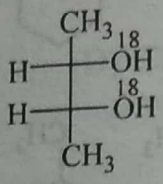
R_1 and R_2 respectively are –

(A) Cold alkaline $KMnO_4$, OsO_4/H_2O_2 (B) Cold alkaline $KMnO_4$, HCO_3H

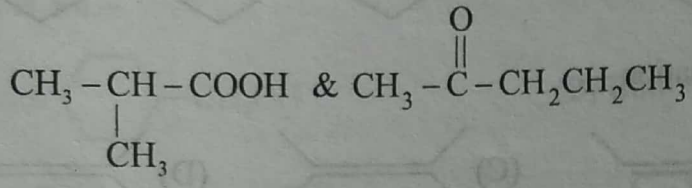
(C) Cold alkaline $KMnO_4$, $CH_3–O–O–CH_3$ (D) $C_6H_5CO_3H$, HCO_3H

Q.29 

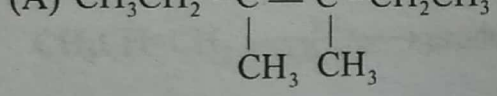
The probable structure of 'X' is

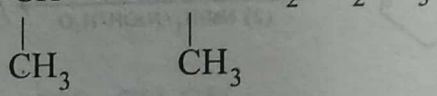
(A)  (B)  (C)  (D) 

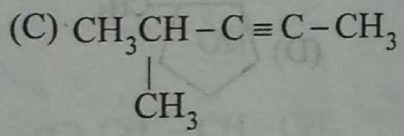
Q.30 Compound (A) on oxidation with hot $KMnO_4$ / OH^- gives two compound

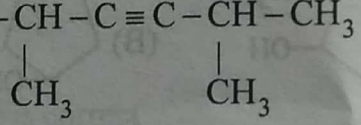


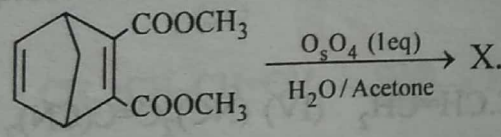
compound A will have structure.

(A) 

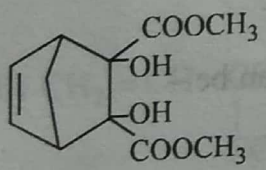
(B) 

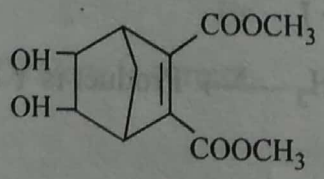
(C) 

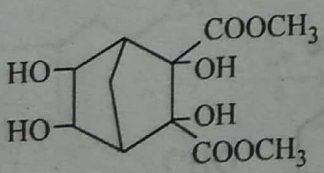
(D) 

Q.31 

Identify 'X'.

(A) 

(B) 

(C) 

(D) Reaction will not occur

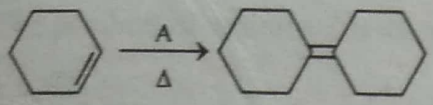
Q.32 Which alkene on heating with alkaline $KMnO_4$ solution gives acetone and a gas, which turns lime water milky –

(A) 2–Methyl–2–butene

(B) Isobutylene

(C) 1–Butene

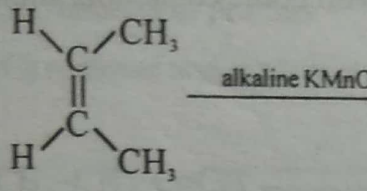
(D) 2–Butene

Q.33 

A can be –

(A) Conc. H_2SO_4/Catalytic amount (B) alcoholic KOH

(C) Et_3N (D) t-BuOK

Q.34  A, which is true about this reaction?

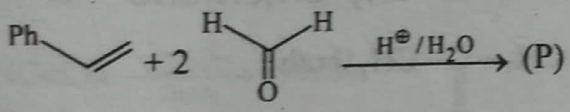
(A) A is meso 2, 3–butanediol formed by *syn* addition

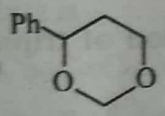
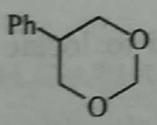
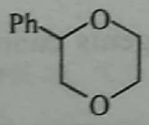
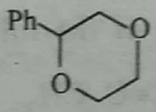
(B) A is meso 2, 3–butanediol formed by *anti* addition

(C) A is a racemic mixture of d and *l*, 2, 3–butanediol formed by anti addition

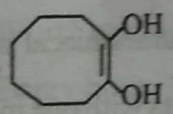
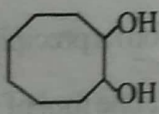
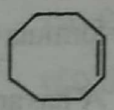
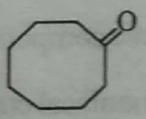
(D) A is a racemic mixture of d and *l* 2,3–butanediol formed by syn addition

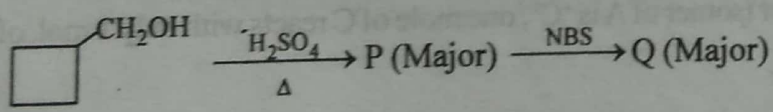
Q.35 Identify (P) in the following reaction:



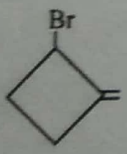
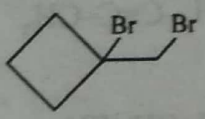
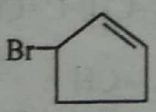
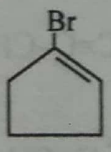
(A)  (B)  (C)  (D) 

Q.36 The reaction of cyclooctyne with $HgSO_4$ in the presence of aq. H_2SO_4 gives

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

Q.37 

The structure of Q is

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

Q.38 Mixture of one mole each of ethene and propyne on reaction with Na will form H_2 gas at S.T.P. –

(A) 22.4 L (B) 11.2 L (C) 33.6 L (D) 44.8 L

Q.39 Acetylene may be prepared using Kolbe's electrolytic method employing –

(A) Pot. acetate (B) Pot. succinate (C) Pot. fumarate (D) None of these

Q.40 $B \xleftarrow{\text{Lindlar}} R-C\equiv C-R \xrightarrow{Na/NH_3} A$

A and B are geometrical isomers –

(A) A is trans, B is cis

(B) A and B both are cis

(C) A and B both are trans

(D) A is cis, B is trans

Q.41 A mixture of CH_4, C_2H_4 and C_2H_2 gaseous are passed through a Wolf bottle containing ammonical cuprous chloride. The gas coming out is

(A) Methane

(B) Acetylene

(C) Mixture of methane and ethylene

(D) original mixture

Q.42 $B \xleftarrow[H_2O_2,\ OH^-]{BH_3,\ THF} CH_3-C\equiv CH \xrightarrow{HgSO_4/H_2SO_4} A$

A and B are –

(A) CH_3CH_2CHO, $CH_3-\overset{\overset{O}{\|}}{C}-CH_3$

(B) $CH_3-\overset{\overset{O}{\|}}{C}-CH_3$ CH_3CH_2CHO

(C) CH_3CH_2CHO (both)

(D) $CH_3-\underset{\underset{O}{\|}}{C}-CH_3$ (both)

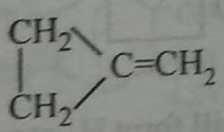
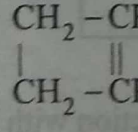
Q.43 Which of the following reagents cannot be used to locate the position of triple bond in $CH_3-C\equiv C-CH_3$

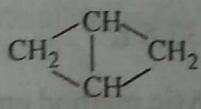
(A) Br_2/CCl_4 (B) O_3/H_2O (C) Cu_2Cl_2/NH_4OH (D) $KMnO_4/H^{\oplus}$

Q.44 An organic compound of molecular formula C_4H_6, (A), forms precipitates with ammoniacal silver nitrate and ammoniacal cuprous chloride. 'A' has an isomer 'B', one mol of which reacts with one mol of Br_2 to form 1, 4-dibromo-2-butene. Another isomer of A is 'C', one mole of C reacts with only 1 mol. of Br_2 to give vicinal dibromide. A, B & C are

(A) $CH_3-CH_2-C\equiv CH$ and $CH_2=CH-CH=CH_2$; 

(B) $CH_3-C\equiv C-CH_3$ and $CH_3-CH=C=CH_2$; $CH_3-C\equiv C-CH_3$

(C)  and  ; $CH_2=CH-CH=CH_2$

(D) $CH_3-C\equiv C-CH_3$ and  ; $CH_2=CH-CH=CH_2$

Q.45 The product of reaction between one mole of acetylene and two mole of HCHO in the presence of Cu_2Cl_2 –

(A) $HOCH_2 - C \equiv C - CH_2OH$ (B) $H_2C = CH - C \equiv C - CH_2OH$

(C) $HC \equiv C - CH_2OH$ (D) None of these

Q.46 In the presence of strong bases, triple bonds will migrate within carbon skeletons by the

(A) removal of protons (B) addition of protons

(C) removal and readdition of protons (D) addition and removal of protons.

Q.47 $CH_3–CH_2–C\equiv CH \underset{B}{\overset{A}{\rightleftharpoons}} CH_3C\equiv C–CH_3$; A and B are –

(A) alcoholic KOH and $NaNH_2$ (B) $NaNH_2$ and alcoholic KOH

(C) $NaNH_2$ and Lindlar catalyst (D) Lindlar and $NaNH_2$ catalyst

Q.48 If a mixture of iso-octane (70%) & n-heptane (30%) is present in sample. The octane number of this sample is :

(A) 40 (B) 70 (C) 30 (D) 85

Q.49 $HC\equiv CH \xrightarrow[Cu_2Cl_2]{NH_4Cl}$ Product

Product is –

(A) Cu–C≡C–Cu (B) H_2C=CH–C≡CH (C) HC≡C–Cu (D) Cu–C≡C–NH_4

Q.50 Which of the following process is not good for the preparation of open chain alkane having odd number of carbons :

(A) Wurtz process (B) Kolbe electrolysis

(C) Corey house synthesis (D) Both (A) & (B)