



## CHEMISTRY

### BOOKS - BITSAT GUIDE

### HYDROCARBONS

#### Practice Exercise

1. Chlorination of n-butane gives the product

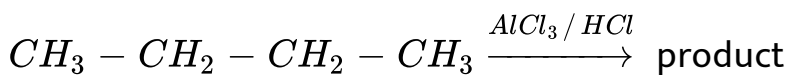
- A. only 2-chlorobutane
- B. only 1-chlorobutane
- C. mixture of s-butyl chloride (excess)+n-butyl chloride
- D. n-butyl chloride and isobutyl chloride

**Answer: C**



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**2. Consider the following reaction**



The reaction is named as

A. insertion

B. cracking

C. inversion

D. isomerisation

**Answer: D**



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3. The concentration aqueous solution of potassium salts of acetic acid and propanoic acid are electrolysed. Which of the following hydrocarbons is/are produced ?

A. only  $CH_3CH_2CH_3$

B.  $CH_3CH_3$  and  $CH_3CH_2CH_2CH_3$

C.  $CH_3CH_2CH_2CH_3$ ,  $CH_3CH_2CH_3$  and  $CH_3CH_3$

D. Only  $CH_3CH_3$

**Answer: C**



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4. A mixture of ethyl bromide and methyl bromide is subjected to Wurtz reaction. The mixture of alkanes so formed, consists

of

- A. propane and butane
- B. ethane and propane
- C. ethane, propane and butane
- D. ethane and butane

**Answer: C**



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**5. Pure methane can be prepared by**

- A. Wurtz reaction
- B. Kolbe's electrolytic method
- C. soda lime decarboxylation

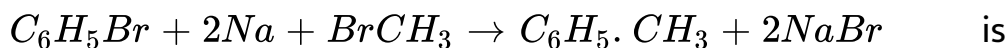
D. reduction with  $H_2$

**Answer: C**



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6. The reaction,



known as

- A. Wurtz reaction
- B. Wurtz-Fitting reaction
- C. Friedel-Crafts reaction
- D. Berthelot synthesis

**Answer: B**



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7. LPG contains

A. methane

B. ethane

C. butane

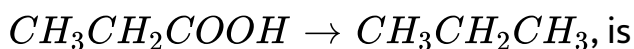
D. None of these

**Answer: C**



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8. The reagent used for the conversion



A.  $LiAlH_4$

B. soda lime

C. red P and concentrated HI

D. amalgamated zinc and concentrated HCl

**Answer: C**



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**9.** The compound with the highest boiling point is:

A. n-hexane

B. n-pentane

C. 2,2-dimethylpropane

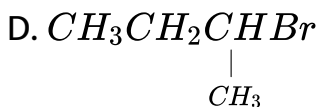
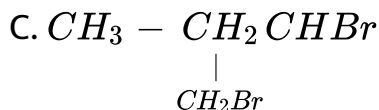
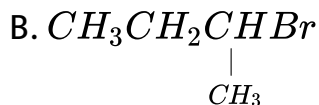
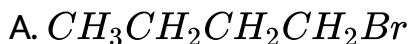
D. 2-methylbutane

Answer: A



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10. The major product of reaction between n-butane and bromine at  $130^{\circ}C$  is



Answer: B



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11. Isomeric pentanes have different value of boiling point for example, n-pentane has highest the boiling point among it three isomers. This is due to

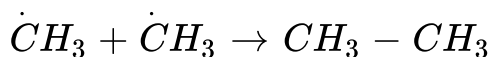
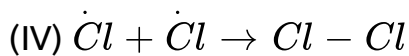
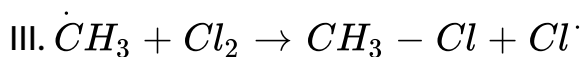
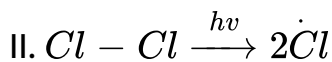
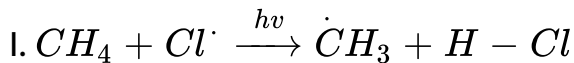
- A. no branching
- B. weak intermolecular force of attraction
- C. large area of contact
- D. None of the above

**Answer: C**



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12. Arrange the correct sequence for mechanism of chlorination of methane.



Choose the correct option is

A. II, I, III and IV

B. I, II, III and IV

C. IV, III, II and I

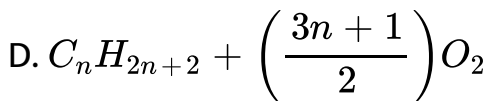
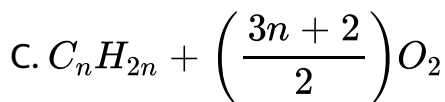
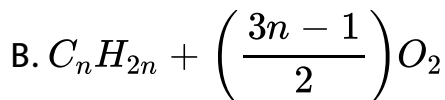
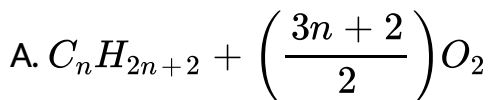
D. II, III, I and IV

**Answer: A**



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13. The reactants involved in general combustion formula for any alkane is represented as

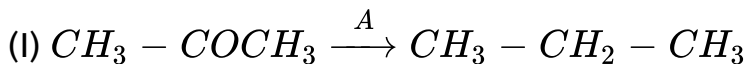


**Answer: D**



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14. Consider the following reactants,



(II)  $(CH_3)_3CH \xrightarrow{B} (CH_3)_3COH$  brgt Here, A and B respectively are

A.  $Zn(Hg)/HCl(\text{conc.})$  and  $KMnO_4$

B.  $KMnO_4$  and  $Zn(Hg)/\text{conc.}HCl$

C.  $H_2 / Ni$  and  $KMnO_4$

D.  $CH_3OH$  and  $C_2H_5OH$

**Answer: A**



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**15.** When 2-methyl butane-1-ol is dehydrated to give an alkene, the preferred product is

A. 2-methyl but-1-ene

B. but-1-ene

C. 2-methyl but-2-ene

D. but-2-ene

**Answer: A**



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**16.** A cylinder of compressed gas that bears no label is supposed to contain either ethane or ethene. Combustion of the sample shows that  $16\text{cm}^3$  of the gas require  $48\text{cm}^3$  of oxygen for complete combustion. This shows that the gas is

A. only ethane

B. only ethene

C. 1:1 mixture of two gases

D. some unknown mixtures of the two gases

**Answer: B**

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17. Cold and dil.  $KMnO_4$  reacts with but-2-ene to form

A. ethane-1, 2-diol

B. butane-1, 4-diol

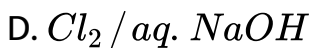
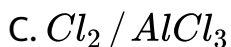
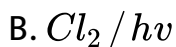
C. butane-1, 3-diol

D. butane-2, 3-diol

**Answer: D**

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18. The conversion of  $ClCH = CH - Cl$  to  $Cl_2CH - CHCl_2$  can be carried out with



**Answer: A**



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19. Isobutyl magnesum bromide with dry ether and absolute alcohol gives

A.  $\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}_2\text{OH}$  and  $\text{CH}_3\text{CH}_2\text{MgBr}$



B.  $\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}_3$  and  $\text{MgBr}(\text{OC}_2\text{H}_5)$



C.  $\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}=\text{CH}_2$  and  $\text{Mg}(\text{OH})\text{Br}$



D.  $\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}_3$  and  $\text{CH}_3\text{CH}_2\text{OMgBr}$

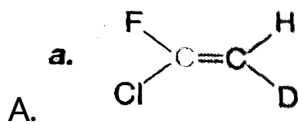


**Answer: B**



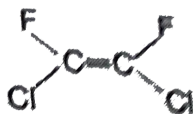
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20. Which of the following will not show geometrical isomerism ?



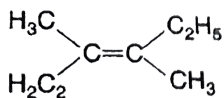


b.



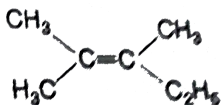
B.

c.



C.

d.



D.

Answer: D



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21. Anti-Markownikoff's addition of HBr is not observed in

A. propene

B. butene

C. but-2-ene

D. pent-2-ene

**Answer: C**



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22. A compound X when passed through dil.  $H_2SO_4$  containing  $HgSO_4$  gives a compound Y which on reaction with HI and red phosphorus gives  $C_2H_6$ . The compound X is

A. ethene

B. ethyne

C. 2-butene

D. 2-butyne

**Answer: B**



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**23.** The addition of halogen to an alkene involves the formation of

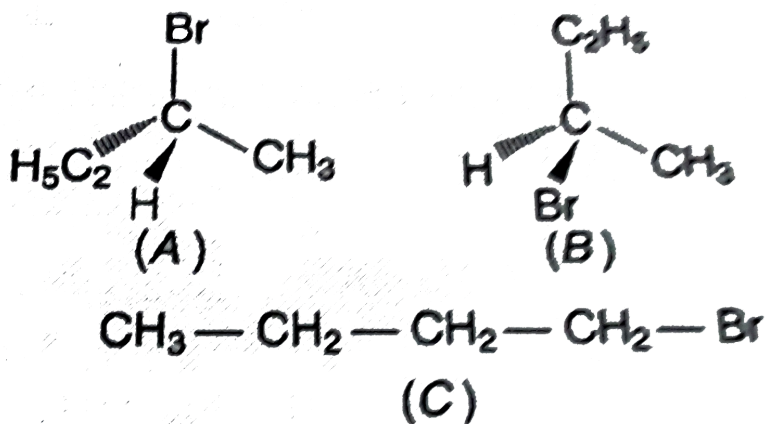
- A. carbocation as the intermediate
- B. carbanion as the intermediate
- C. free radical as the intermediate
- D. halonium ion as the intermediate

**Answer: D**



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24. The addition of HBr of 1-butene gives a mixture of products A,B and C



(C)  $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{Br}$

The mixture consists of

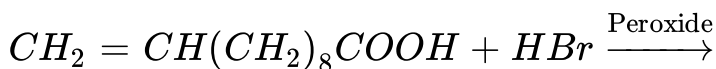
- A. A and B as major and C as minor products
- B. B as major, A and C as minor products
- C. B as minor, A and C as major products
- D. A and B as minor and C as major products

**Answer: A**

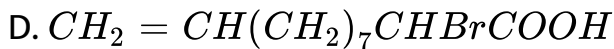
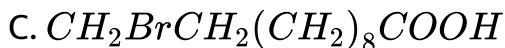
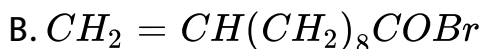
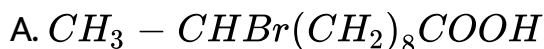


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**25.** The principal organic product formed is the reaction :



is

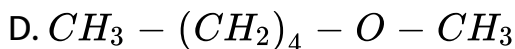
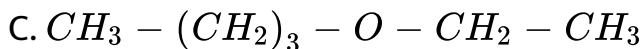
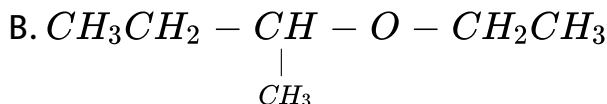
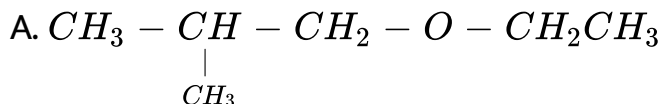
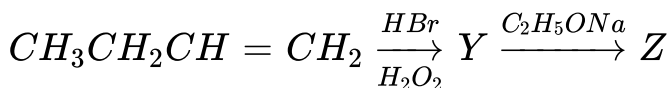


**Answer: C**



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26. Identify Z in the sequence of reactions :

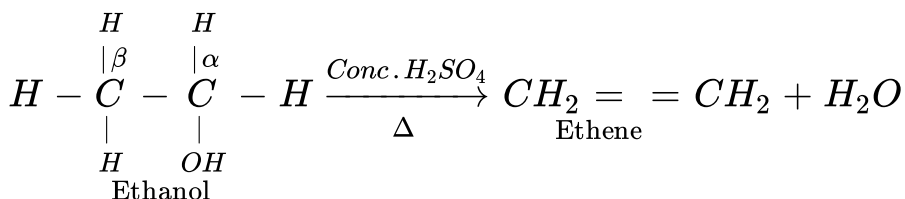


Answer: C



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27. The following reaction is an example of



- A. oxidation reaction
- B. reduction reaction
- C.  $\alpha$ -elimination reaction
- D.  $\beta$ -elimination reaction

**Answer: D**



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28. According to Markownikoff's rule, the major product formed by addition of HBr with propene is

- A. 1-bromopropane
- B. 1-bromo, 1-methyl ethane
- C. 2-bromopropane
- D. 2, 2-dibromopropane

**Answer: C**



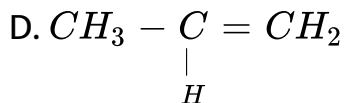
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**29.** What will be the product of the following reaction?



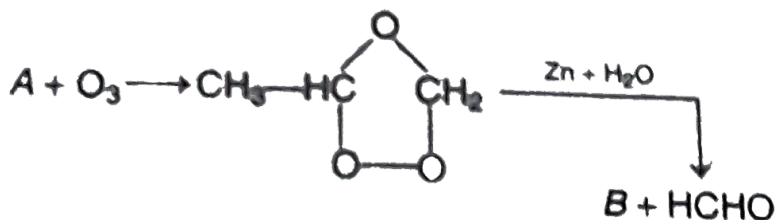
- A.  $CH_3CH_2CH_2Br$
- B.  $CH_3CH(Br)CH_3$
- C.  $CH_3CBr_2CH_3$





Answer: A

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30.

Here, A and B respectively are

A. propene and methanal

B. propene and ethanal

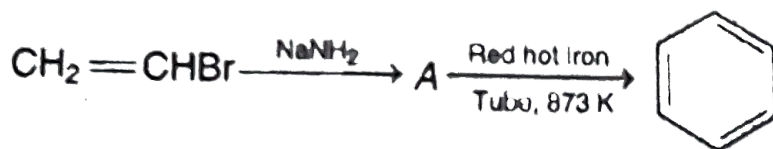
C. propene and ethanol

D. propene and ethanal

Answer: D

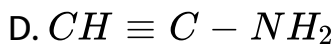
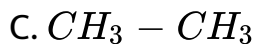
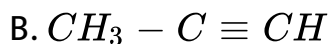
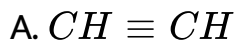


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31.

Here, A is

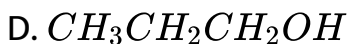
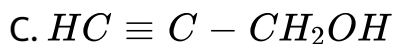
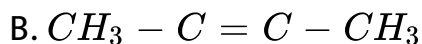
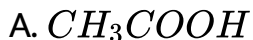


Answer: A



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32. Which one of the following compounds will react with two mole of  $CH_3MgBr$  ?

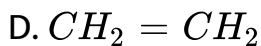
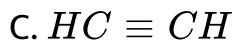
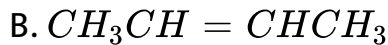


Answer: C



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33. An organic compound on treatment with  $Br_2 / CCl_4$ , gives a bromoderivative alkene. The compound will be

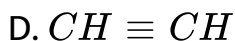
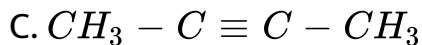
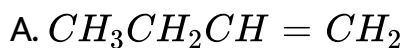


**Answer: C**



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**34.** Which of the following shows less reactivity towards  $\text{Br}_2$  ?

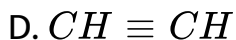
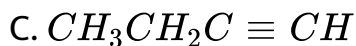
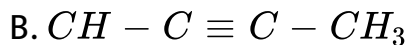
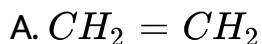


Answer: D



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



Answer: D



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36. n-propyl bromide on treatment with ethanolic potassium hydroxide produces

- A. propanol-1
- B. propene
- C. propanol-2
- D. ethyl propyl ether

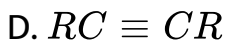
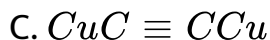
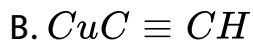
**Answer: B**



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37. When an alkyne  $RC \equiv CH$  is treated with cuprous ion in an ammoniacal medium one of the products is

- A.  $RC \equiv CCu$



**Answer: A**



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

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

B. methanal and 2-methyl-2-butanone

C. methanal and 3-methyl-2-butanone

D. methanoic acid and 2-methyl-2-butanone

**Answer: C**



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**39.** Which of the following is the predominant product in the reaction of  $\text{HOBr}$  with propene?

A. 2-bromo-1-propanol

B. 3-bromo-1-propanol

C. 2-bromo-2-propanol

D. 1-bromo-2-propanol

**Answer: D**



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

- A. propanal
- B. n-propyl hydrogen sulphate
- C. acetone
- D. propanol

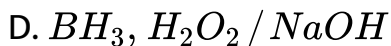
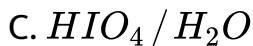
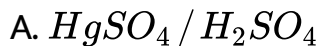
**Answer: C**



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41. What is the best way to carry out of the following transformation ?

1-pentyne  $\rightarrow$  pentanal



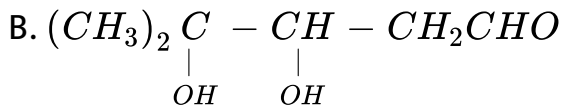
**Answer: D**



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**42.** On vigorous oxidation by permanganate solution

$(CH_3)_2C = CHCH_2CHO$  gives



D.  $(CH_3)_2CO$  and  $CH_2(COOH)_2$

**Answer: D**



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**43.** Acidic hydrogen is present in

A. ethyne

B. ethene

C. benzene

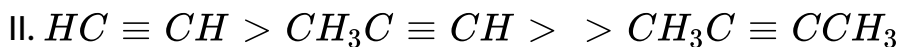
D. ethane

**Answer: A**



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44. Which of the following order is correct regarding acidic character of hydrocarbons given below?



A. Only I

B. Only II

C. Both I and II

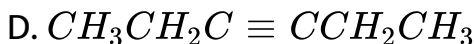
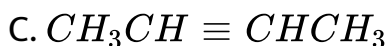
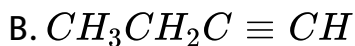
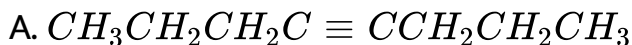
D. None of these

Answer: C



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45. The hydrocarbon, which can react with sodium in liquid ammonia is



Answer: B



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46. Which of the following is non-aromatic?

A. Benzene

- B. Tropylium cation
- C. Cyclopentadienyl anion
- D. Cyclooctatetraene

**Answer: D**



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**47.** Toluene, on oxidation with  $KMnO_4$  gives

- A. benzaldehyde
- B. phenol
- C. nitrotoluene
- D. benzoic acid

**Answer: D**



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**48. Ozonolysis of benzene gives**

A. 8 moles of glyoxal

B. glycol

C. 6 moles of glyoxal

D. 3 moles of glyoxal

**Answer: D**



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49. Benzene was discovered by

- A. Faraday
- B. Berthelot
- C. Kekule
- D. Huckel

**Answer: A**



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50. Which of the following is the active species in the nitration of aromatic organic compounds ?

- A.  $\text{NO}_2^-$

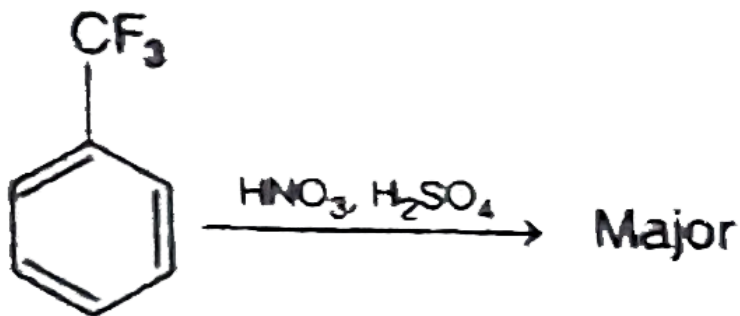


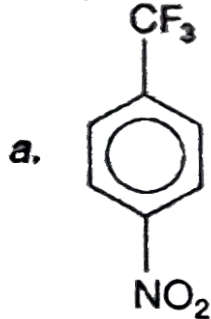


Answer: C

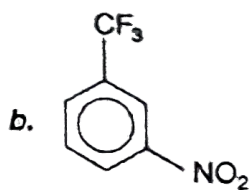
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51. Give the major product of the following reaction.

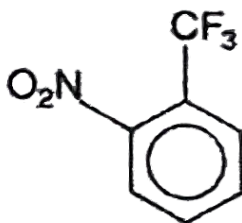




A.



B.



C.

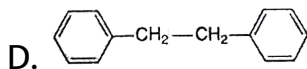
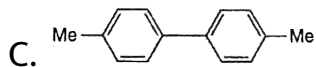
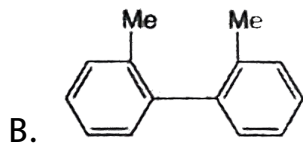
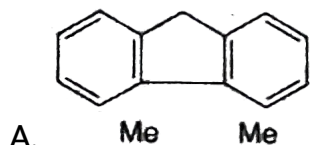
D. Cannot say

**Answer: B**



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52.  $PhCH_3$  on reaction with  $Cl_2 + h\nu$  followed by Na/ether will give



**Answer: D**



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53. The reaction of 1, 3-butadiene and acetylene gives

**a.**



A.



B.

**c.**



C.

D. None of these

**Answer: B**



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**54.** When nitrobenzene is treated with  $Br_2$  in presence of  $FeBr_3$ , the major product formed is *m* – bromo –

nitrobenzene. Statement which is related to obtain the  $m$  – isomer is

- A. the electron density on meta-carbon is less than on ortho and para-positions
- B. the intermediate carbonium ion formed after initial attack of  $Br^+$  at the meta-position is least destabilised
- C. loss of aromaticity when  $Br^+$  attacks at the ortho and para-positions and not at meta-position
- D. easier loss of  $H^+$  to regain aromaticity from the meta-position than from ortho and para-positions

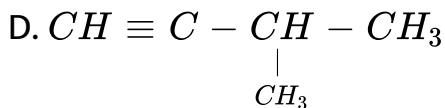
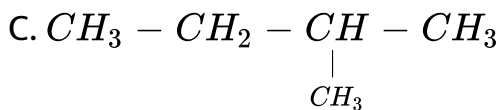
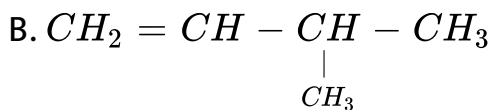
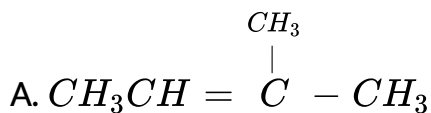
**Answer: B**



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55. A hydrocarbon reacts with HI to give X which on reaction with aqueous KOH forms Y. Oxidation of Y gives 3-methyl, 2-butanone.

The hydrocarbon is

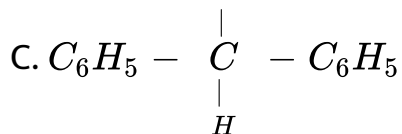
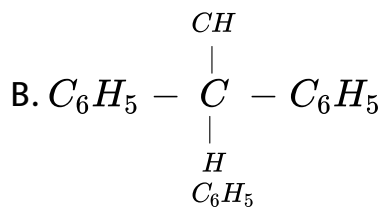
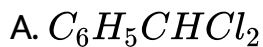


**Answer: B**



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56. A Friedel-Crafts reaction of benzene with chloroform produces

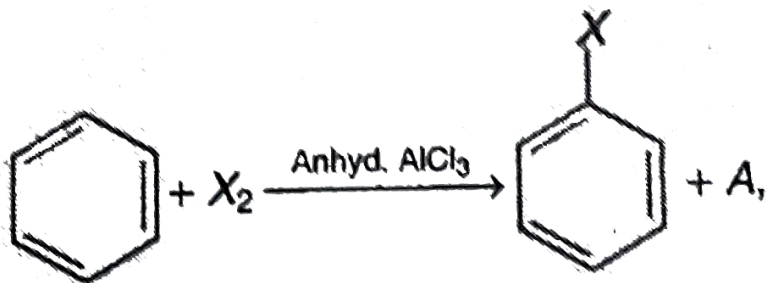


D. All of these

**Answer: C**



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57.

Here, A is

A.  $H_2$

B.  $X^-$

C.  $HX$

D. Both b and c

**Answer: C**



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**58.** Consider the following statements,

I. The -OH group present in the phenol is ortho and para-directing .

II. Directive influence of a fundamental group in monosubstituted benzene depends on the nature of the substituent already present in the benzene ring.

III. The -OH group activates the benzene ring for the attack by an electrophile.

IV. Groups such as  $-NH_2$ ,  $-NHR$ ,  $-NHCOCH_3$ ,  $-OCH_3$ ,  $-CH_3$ ,  $-C_2H_5$ , etc, are the examples of activating group.

Selection the correct option.

A. I and II

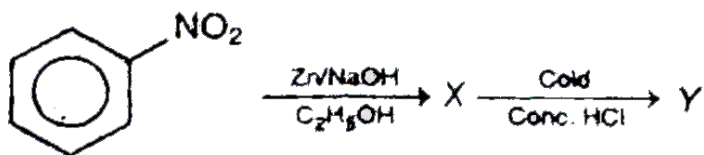
B. II and III

C. II, III and IV

D. I, II, III and IV

Answer: D

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59. X and Y are

X and Y are

A.  $\text{C}_6\text{H}_5\text{NHOH}$ ,  $\text{C}_5\text{H}_4(\text{OH})\text{NH}_2$

B.  $\text{C}_6\text{H}_5 - \text{N}_2\text{H}_4 - \text{C}_6\text{H}_5$ ,  $\text{C}_6\text{H}_4 - \overset{\text{Cl}}{\underset{|}{\text{N}}}\text{C}_6\text{H}_4 - \overset{\text{Cl}}{\underset{|}{\text{N}}}\text{H}$

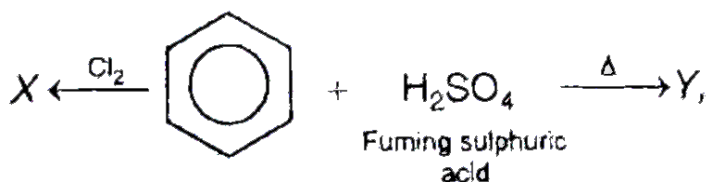
C. Both (a) and (b)

D. None of the above

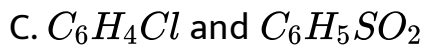
Answer: D

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60. In the reaction,



X and Y are respectively,



Answer: A



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**61.** Which of the following organic materials damage DNA of our body ?

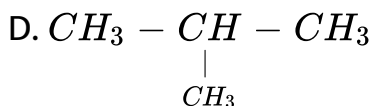
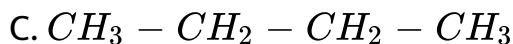
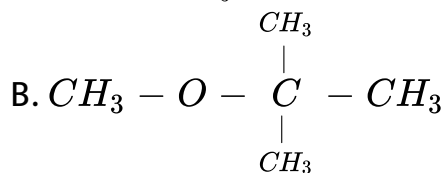
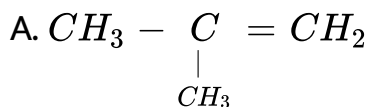
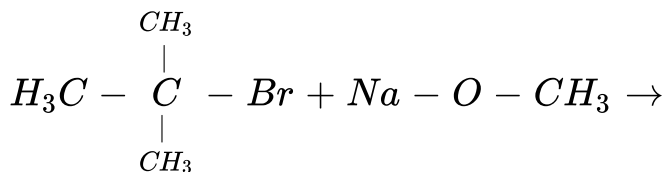
- A. Tobacco
- B. Coal
- C. Petroleum
- D. All of the above

**Answer: D**



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1. What will be the product of the reaction ?

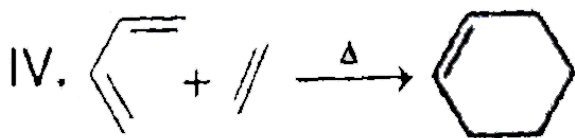
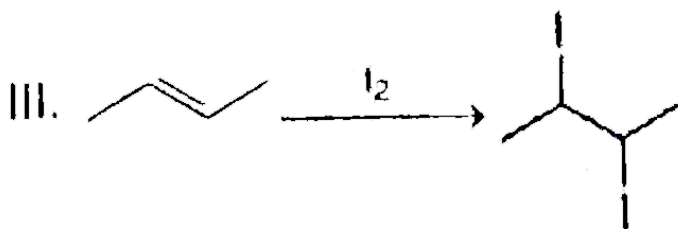
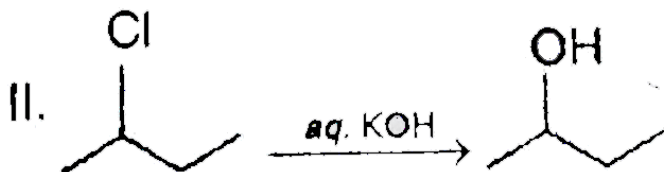
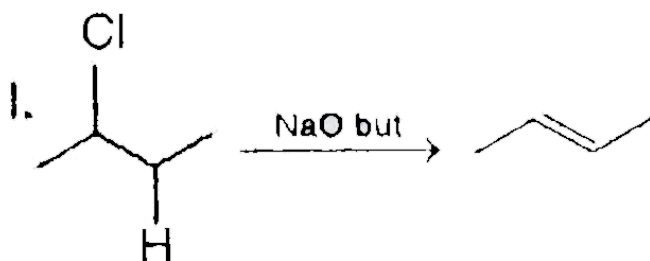


Answer: A



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2. The types of the reactions for these are



I.

A. elimination, substitution, addition, addition

B. addition, elimination, addition, substitution

C. elimination, addition, substitution, addition

D. substitution, elimination, addition, addition

**Answer: A**



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**3.** Which of the following reaction produces most stable alkene ?

A. 2-chloro butane

B. 2, 3-dichloro butane

C. 2, 2-dichloro butane

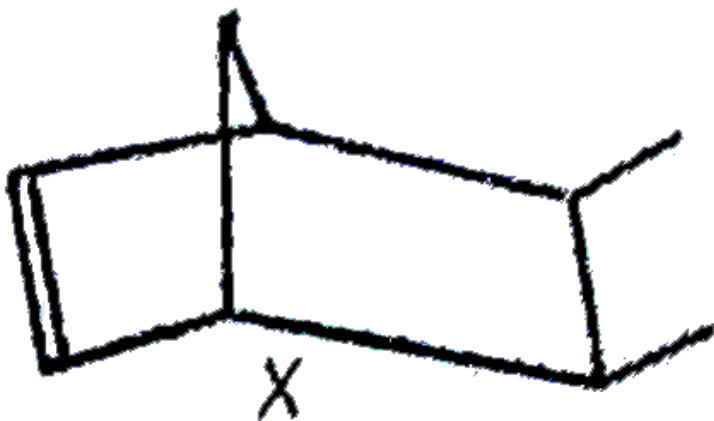
D. 2, 3-dichloro, 2, 3-dimethyl butane

**Answer: D**



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4. IUPAC name and degree of unsaturation of compound X is



- A. 2, 3-dimethyl bicyclo [2,2,1] hept-5 ene, 2
- B. 1, 2-dimethyl bicyclo [2,2,1] hept-4 ene , 3
- C. 5, 6-dimethyl bicyclo [2,2,1] hept-2 ene, 3
- D. 4, 5-dimethyl bicyclo [2,2,1] hept-1 ene, 2

**Answer: C**



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5. Lindane can be obtained by the reaction of benzene with

- A.  $CH_3Cl$  / anhyd.  $AlCl_3$
- B.  $C_2H_5I$  / anhyd.  $AlCl_3$
- C.  $CH_3COCl$  / anhyd.  $AlCl_3$
- D.  $Cl_2$  in sunlight

**Answer: D**



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6. What will be the main product when acetylene reacts with hypochlorous acid ?

A. Trichloro acetaldehyde

B. Acetaldehyde

C. Dichloro acetaldehyde

D. Chloro acetaldehyde

**Answer: C**



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7. In which of the following compounds, the bond length between hybridised carbon atom and other carbon atom is minimum?

A. Butane

B. Propyne

C. Propene

D. Butene

**Answer: B**



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8. The treatment of benzene with isobutene in the presence of sulphuric acid gives

A. iso-butylbenzene

B. tert-butylbenzene

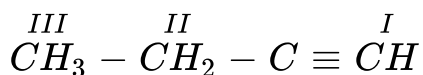
C. n-butylbenzene

D. No reaction

**Answer: B**

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9. Which of the following carbon atoms is most electronegative ?



A. I

B. II

C. III

D. All are equally electronegative

**Answer: A**

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10. The reaction/method that does not give an alkane is

- A. catalytic hydrogenation of alkenes
- B. hydrolysis of alkyl magnesium bromide
- C. Kolbe's electrolytic method
- D. dehydrohalogenation of an alkyl halide

**Answer: D**



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11. The most strained cycloalkane is :

- A. cyclopropane
- B. cyclobutane

C. cyclopentane

D. cyclohexane

**Answer: A**



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**12.** The number of isomers of  $C_6H_{14}$  is:

A. 4

B. 5

C. 6

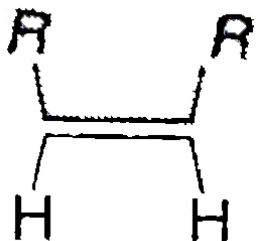
D. 7

**Answer: B**

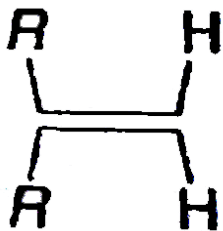


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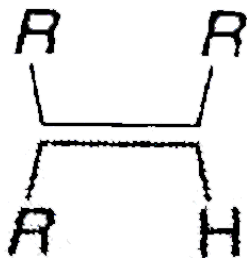
13. Which of the following alkenes will react fastest with  $H_2$  under catalytic hydrogenation conditions



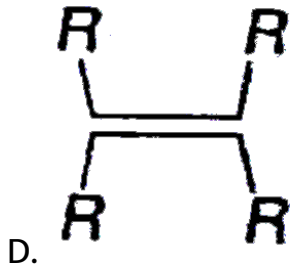
A.



B.



C.



Answer: A



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14. Which of the following reagents would you prefer to find out whether the hydrocarbon  $C_3H_4$  contains one-triple bond or two double bonds?

A. Fehling solution

B. Ammoniacal  $AgNO_3$  or  $CuCl$  solution

C. Baeyer's reagent

D.  $Br_2 / CCl_4$



**Answer: B**



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**15. Which of the following compounds (s) has Z configuration?**

I. 

II. 

III. 

A. Only I

B. Only II

C. Only III

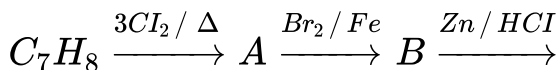
D. I and III

**Answer: D**



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16. The compound  $C_7H_8$  undergoes the following reactions



The product 'C' is .

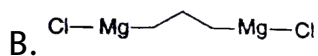
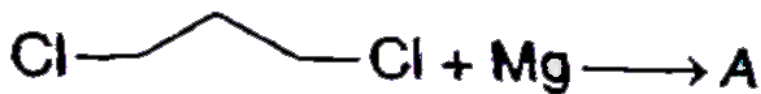
- A. 3-bromo 2, 4 = 6 -trichlorotoluene
- B. o-bromotoluene
- C. p-bromotoluene
- D. m-bromotoluene

**Answer: D**



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17. What is the product A in the following?



C. Both a and b

D. None of the above

**Answer: A**



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**18.** How many asymmetric carbon atoms are present in

(i) 1, 2-dimethylcyclohexane

(ii) 3-methylcyclopentene and

(iii) 3-methylcyclohexene

A. two, one , one

B. one, one, one

C. Two, none, two

D. two, none, one

**Answer: A**



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**19.** Bicyclo (1, 1, 0) butane is

A.



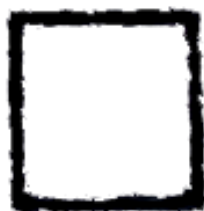
B.



C.



D.



**Answer: C**



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