



CHEMISTRY

BOOKS - MHTCET PREVIOUS YEAR PAPERS AND PRACTICE PAPERS

ALKANES

Exercise 1

1. The IUPAC name of compound



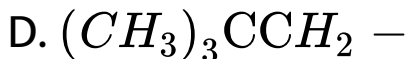
- A. 4-methyloctane
- B. 2-propylhexane
- C. 2-butylpentane
- D. None of the above

Answer: A



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2. Which of the following is a 3 methyl butyl group.



Answer: B



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3. What is the correct IUPAC name of the alkyl group shown ?

{:(" "CH₂CH₃),(" "|),(-

CHCH₂CH(CH₃)₂):}

- A. 1-ethyl-3-methylbutyl
- B. 1-ethyl-3,3-dimethyl propyl
- C. 4-ethyl-2-methylbutyl
- D. 5-methylhexyl

Answer: A



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4. Choose the response that best describes the following compounds



- A. 1,3 and 4 represent the same compound
- B. 1 and 3 are isomers of 2 and 4
- C. 1 and 4 are isomers of 2 and 3
- D. All the structures represent the same compound

Answer: A



5. Which of the following substances is not an isomer of 3-ethyl 2-methyl pentane?

A. 

B. 

C. 

D. None of these

Answer: B

6. Eclipsed form of ethane has higher energy due to

A. Torsional strain

B. Steric strain

C. Angle strain

D. Both a and b

Answer: D



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7. Most stable conformation of n-butane is :

A. 

B. 

C. 

D. 

Answer: C



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8. The order of stability for the conformations of n-butane among these is

anti	<i>I</i>
gauche	<i>II</i>
eclipsed (partial)	<i>III</i>
eclipsed (fully)	<i>IV</i>

A. $I > II > III > IV$

B. $IV > III > II > I$

C. $III > II > I > IV$

D. $II > III > I > IV$

Answer: A





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9. Which of the following conformation has maximum energy ?

A. Eclipsed

B. Staggered

C. Gauche

D. Equal

Answer: A



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10. Select the correct statement (s)

A. Staggered and eclipsed conformers

cannot be physically separated because

the energy difference between them is

so small that they readily interconvert at

room temperature

B. Conformers exist due to the

tetrahedral nature of carbon bonding

and the fact that the σ - bond is
cylindrically symmetrical

C. Both a and b are correct

D. None of the above

Answer: A



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11. Which of the alkane is synthesised from
single alkyl halide ?

A. 

B. 

C. 

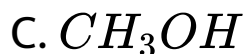
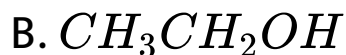
D. 

Answer: B



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12. Both CH_4 and C_2H_6 can be prepared in one step by the reaction of



Answer: A



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13. $C_5H_{11}Cl$ by Wurtz reaction forms 2,2,5,5-tetramethylhexane as the main product . Then , what is the IUPAC name of the reactant ?

A. 2,2-dimethyl-1-chloropropane

B. 2-methyl-1-chlorobutane

C. Both a and b are correct

D. None of the above

Answer: A



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14. $C_6H_{12}(A)$ has two types of alkenes that can be reduced to one type of $C_6H_{14}(B)$. B is

A. 

B. 

C. 

D. 

Answer: B



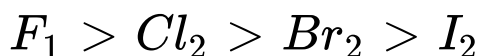
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15. Select the correct statement (s)

A. In the chlorination of n-butane , 2-chlorobutane is formed faster than 1-chlorobutane

B. Bromine is less reactive towards alkanes in general than chlorine but bromine is more selective at the site of attack when it does react.

C. Reactivity of halogens towards alkanes is in order



D. All of the above

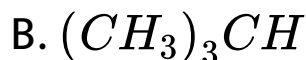
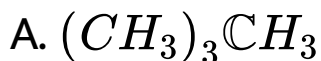
Answer: D



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16. $(CH_3)_3COH + CH_3MgBr \rightarrow$

hydrocarbon (A), (A) is



D. None of the above

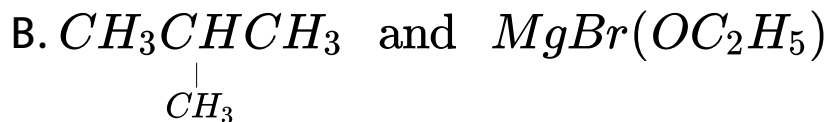
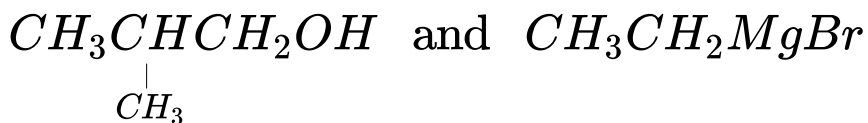
Answer: C



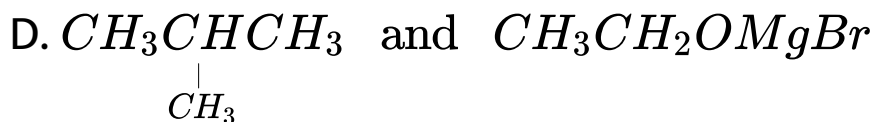
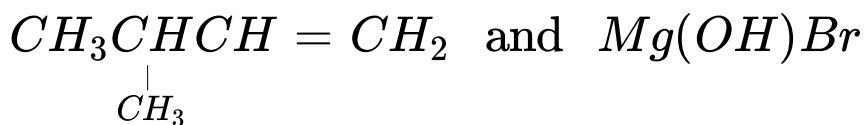
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17. Iso-butyl magnesium bromine with dry ether and ethyl alcohol gives

A.



C.

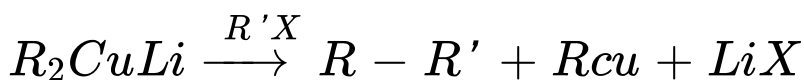


Answer: B



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18. In the following reaction ,



Nature of R and R' should be

A. Any alkyl, 2° alkyl

B. Any alkyl, methyl/1° alkyl/2° cycloalkyl

C. 1° alkyl, methyl/1° alkyl/2° cycloalkyl

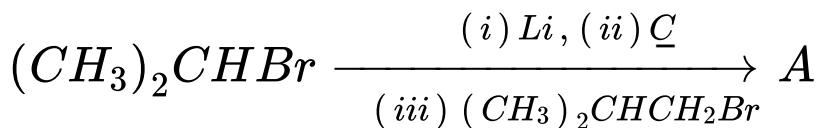
D. 2° alkyl, any alkyl

Answer: C



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19. Consider the following reaction



This is Corey - House method of synthesis of A
which is



D. None of the above

Answer: A



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20. The product formed by heating sodium propionate with sodalime is

A. Acetone

B. Propyl amine

C. Ethane

D. Acetaldehyde

Answer: C



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21. As branching in alkane increases, boiling point decreases due to

A. Decreased surface area for intermolecular attraction

B. Dipole - dipole interactions

C. Both a and b are correct

D. None of the above

Answer: A



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22. Which of the following has maximum boiling point?

A. 

B. 

C. 

D. 

Answer: B



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23. 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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24. Which has maximum boiling and melting point out of



A. I in both case

B. Both I and II

C. Both I and III

D. Both II and I

Answer: C



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25. Consider the following statements

(I) In a group of isomeric acyclic compounds, normal compound always has the highest boiling and melting points.

(II) Greater the branching in alkanes, lower is the boiling point .

(III) Melting point of alkanes depend upon the packing of molecules in the crystalline lattice .

Select the correct statements

A. Both I and II

B. Both II and III

C. Both I and III

D. All of these

Answer: D



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26. An alkyl bromine, RBr of molecular weight 151 is the exclusive product of bromination of which hydrocarbon ?

A. Dodecane

B. 2,2-dimethylpropane

C. 2,2-dimethylhexane

D. 2,2,3-trimethylheptane

Answer: B



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27. On mixing certain alkane with chlorine and irradiating it with ultraviolet light, it forms only one monochloroalkane. The alkane is

A. Neo-pentane

B. Propane

C. Pentane

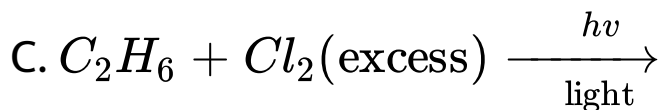
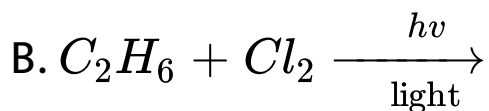
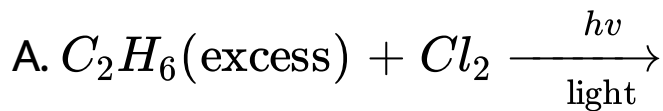
D. Iso-pentane

Answer: A



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28. The reaction conditions leading to the best yield of C_2H_5Cl are



D. None of the above

Answer: A



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29. Which of the following alkane on mono chlorination produces racemic mixture ?

A. Neo-pentane

B. N-butane

C. 2,3-dimethylbutane

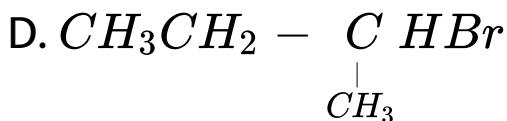
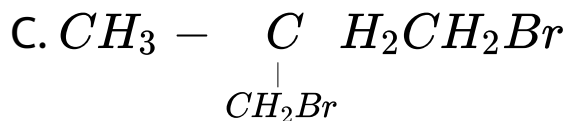
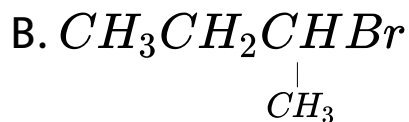
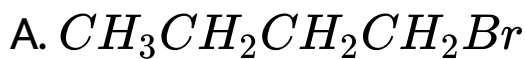
D. 2,2,3,3-tetramethylbutane

Answer: B



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



Answer: B



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31. In the iodination of alkane, some HIO_3 is also added so that

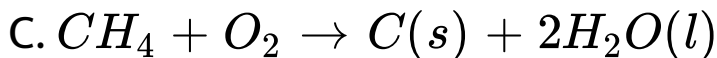
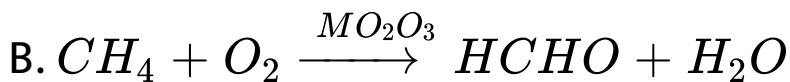
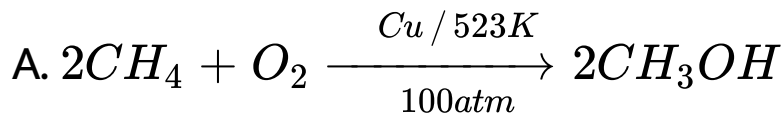
- A. Reaction is made faster
- B. Reaction is made reversible
- C. HI formed is oxidised to I_2
- D. Reaction is selective

Answer: C



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



Answer: C



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33. Rank the following substances in decreasing order heats of combustion (most

exothermic \rightarrow least exothermic).



A. $2 > 1 > 3$

B. $2 > 3 > 1$

C. $3 > 1 > 2$

D. $3 > 2 > 1$

Answer: A



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34. Cracking of ethane gives mixture of

A. C_2H_4 and H_2

B. C_2H_4 , H_2 and CH_4

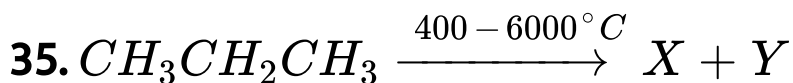
C. H_2 and CH_4

D. CH_4

Answer: B



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X and Y are

A. Hydrogen, methane

B. Methane, ethylene

C. Hydrogen, ethylene

D. Ethylene, ethane

Answer: B



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Exercise 2

1. The hydrocarbon which is a liquid at room temperature is:

A. pentane

B. Butane

C. Propane

D. Ethane

Answer: A



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2. C_8H_{18} with two quaternary carbon atoms will have

- A. one $-CH_2$ and six $-CH_3$ groups
- B. one $-CH_2$ and five $-CH_3$ groups
- C. two $-CH_2$ and four $-CH_3$ groups
- D. six CH_3 groups

Answer: D



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3. The correct IUPAC name of the following alkane is



- A. 3,6-diethyl-2-methyloctane
- B. 5-isopropyl-3-ethyloctane
- C. 3-ethyl-5-isopropyloctane
- D. 3,3-isopropyl-6-ethyloctane

Answer: A



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4. Following reaction is of the type



- A. Nucleophilic addition
- B. Nucleophilic substitution
- C. Electrophilic addition
- D. Electrophilic substitution

Answer: C



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

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

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

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

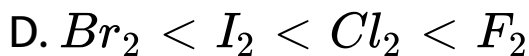
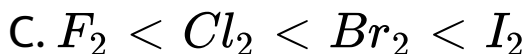
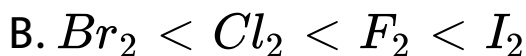
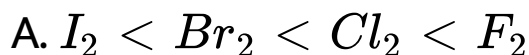
D. $R-Br < R-I < R-Cl$

Answer: B



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



Answer: A



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8. A mixture of ethyl iodide and n-propyl iodide is subjected to Wurtz reaction. The hydrocarbon that will not be formed is

A. Butane

B. Propane

C. Pentane

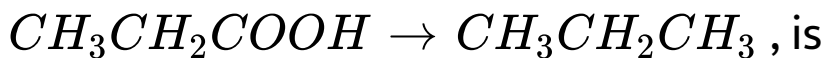
D. Hexane

Answer: B



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9. The reagent used for the conversion



A. $LiAlH_4$

B. Sodalime

C. Red P and concentrated HI

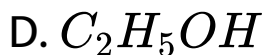
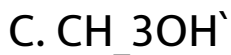
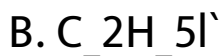
D. Amaigamated zinc and concentrated HCl

Answer: C



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



Answer: A



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

(A). N-butane

(B). 2-methylbutane

(C). N-pentane

(D). 2,2-dimethylpropane

A. AgtBgtCgtD

B. BgtCgtDgtA

C. DgtCgtBgtA

D. CgtBgtDgtA

Answer: D



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12. Pure methane can be prepared by

- A. Wurtz reaction
- B. Kolbe's electrolytic method
- C. Sodalime decarboxylation
- D. Reduction with H_2

Answer: C



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13. The highest boiling point is expected for:

A. Iso-octane

B. n-octane

C. 2,2,3,3-tetramethyl butane

D. n-butane

Answer: B



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

- A. 2-methylpentane
- B. 2,2-dimethylbutane
- C. 2,3-dimethylbutane
- D. n-hexane

Answer: C



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15. On mixing certain alkane with chlorine and irradiating it with ultraviolet light, it forms only one monochloroalkane. The alkane is

A. Propane

B. Pentane

C. Iso-pentane

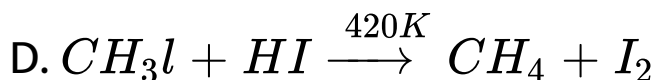
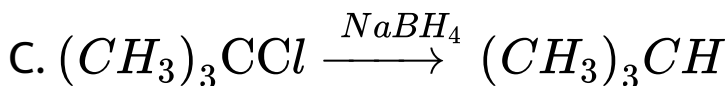
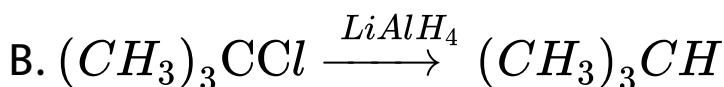
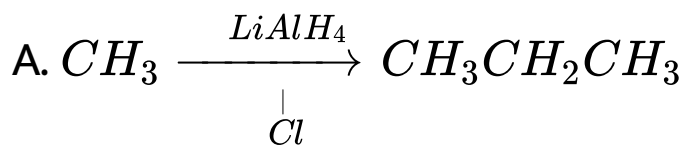
D. Neo-pentane

Answer: D



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16. Which of the following reaction is not correct ?



Answer: B



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17. Which of the following alkanes can be easily sulphonated?

A. n-butane

B. iso-butane

C. n-pentane

D. n-hexane

Answer: D



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18. Using C_2H_5Cl/Na by Wurtz reaction in addition to C_4H_{10} , C_2H_4 and C_2H_6 are also formed. It is due to

- A. Oxidation
- B. Reduction
- C. Disproportionation
- D. Auto-oxidation

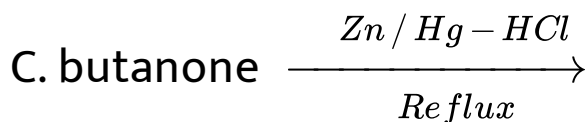
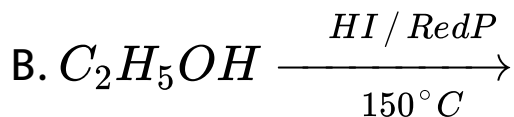
Answer: C



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19. The alkane is not obtained from

A. Hydroxylation of ethyne



D. Electrolysis of sodium propanoate solution

Answer: A



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20. $\overset{\text{O}}{\parallel} \text{RCCH}_3$ (ketone) can be reduced to RCH_2CH_3 (alkane) by

I. LiAlH_4

II. P/HI

III. Zn(Hg)/conc. HCl

IV. $\text{N}_2\text{H}_4 / \text{C}_2\text{H}_5\text{O}^-\text{N}^+\text{a}$

Select the correct reagents

A. I, II and III

B. I, III and IV

C. I, II and IV

D. II, III and IV

Answer: D



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