
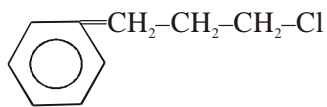
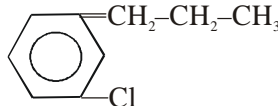
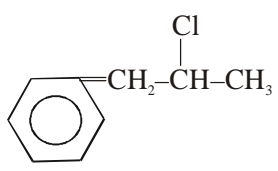
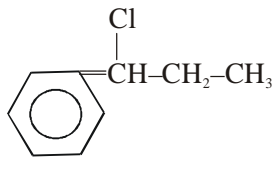
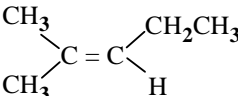
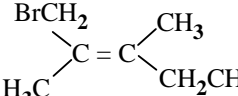
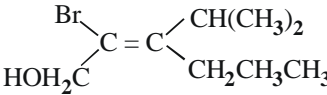
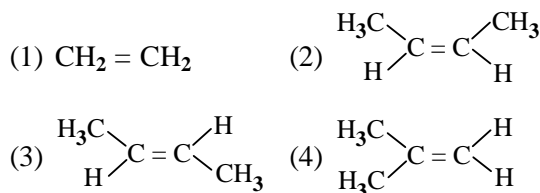


Hydrocarbons

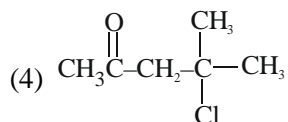
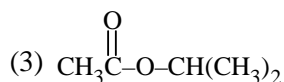
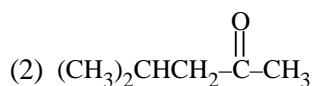
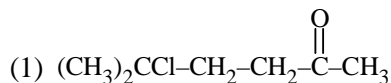
- Which will give Tollen's Test
 - $\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}_3$
 - $\text{CH}_3 - \text{CH}_2 - \text{C} \equiv \text{CH}$
 - $\text{CH}_3 - \text{CH} = \text{CH} - \text{CH}_3$
 - $\text{CH}_2 = \text{CH} - \text{CH} = \text{CH}_2$
- Which species represents the electrophile in nitration of benzene
 - NO_2^-
 - NO_2^+
 - NO_2
 - NO_3^-
- Which of the following has the highest nucleophilicity?
 - F^-
 - OH^-
 - CH_3^-
 - NH_2^-
- Al_4C_3 on hydrolysis gives
 - Ethane
 - Methane
 - Methanal
 - Methanol
- Pure methane can be produced by
 - Wurtz Reaction
 - Kolbe's Electrolytic method
 - Soda-lime decarboxylation method
 - Reduction with hydrogen
- Benzene is obtained by fractional Distillation of
 - Light oil
 - Middle oil
 - Heavy oil
 - Antheracene oil
-  + $\text{Cl} \cdot \text{CHO} \xrightarrow[\text{AlCl}_3]{\text{Anhydrous}}$ [A] the product [A] is
 - Benzoic acid
 - Phenol
 - Benzaldehyde
 - Chlorobenzene
- Octane number is zero for
 - Isotentane
 - n-Heptane
 - Iso-octane
 - n-Octane
- When acetylene reacts with CH_3MgBr , the main product is
 - Methane
 - Ethane
 - Ethylene
 - Methanol
- Anti-Markownikov's addition of HBr is not observed in
 - Propene
 - Butene-1
 - But-2 ene
 - Pent - 2 ene
- Acidic hydrogen is present in
 - Ethene
 - Ethyne
 - Benzene
 - Ethane
- When propyne is treated with $\text{dil-H}_2\text{SO}_4$ and HgSO_4 , the product formed is
 - Propene
 - Propanone
 - Ethyne
 - Propanoic acid
- Cracking of butane gives
 - But-1-ene and Hydrogen
 - But-2-ene and Hydrogen
 - Methane, ethane, ethene and propane
 - All of these
- Consider the following substances :
 - CH_2N_2
 - $\text{CH}_2 = \text{C} = \text{O}$
 - CH_2I_2
 Those compounds which would generate carbenes on exposure to ultraviolet light include
 - 1, 2 and 3
 - 1 and 3
 - 1 and 2
 - 2 and 3
- The kind of delocalization involving σ -bonding orbitals is called
 - Inductive effect
 - Mesomeric effect
 - Hyperconjugation effect
 - Electromeric effect
- Propylbenzene with chlorine in presence of light gives
 - 
 - 
 - 
 - 
- When bromoethane is subjected to Wurtz reaction, the hydrocarbon mixture so-obtained consist of
 - Butane only
 - Butane and ethane
 - Butane and ethene
 - Butane, ethane and ethene
- Which one of the following alkanes can be synthesized by Wurtz reaction in good yield ?
 - $(\text{CH}_3)_2\text{CHCH}_2\text{CH}(\text{CH}_3)_2$
 - $(\text{CH}_3)_2\text{CHCH}_2\text{CH}_2\text{CH}(\text{CH}_3)_2$
 - $\text{CH}_3\text{CH}_2\text{C}(\text{CH}_3)_2\text{CH}_2\text{CH}_3$
 - $(\text{CH}_3)_3\text{CCH}_2\text{CH}_2\text{CH}_3$

19. Which one of the following compounds will react with two mol of CH_3MgBr ?
- (1) CH_3COOH
 - (2) $\text{CH}_3\text{-C} \equiv \text{C-CH}_3$
 - (3) $\text{HC} \equiv \text{C-CH}_2\text{OH}$
 - (4) None of these
20. Which one of the following compounds would have the highest heat of hydrogenation ?
- (1) $\text{H}_2\text{C} = \text{CH}_2$
 - (2) $\text{CH}_3\text{CH}_2\text{-CH} = \text{CH}_2$
 - (3) $\text{H}_3\text{C-CH} = \text{CH-CH}_3$
 - (4) $(\text{CH}_3)_2\text{C} = \text{C}(\text{CH}_3)_2$
21. Select the product with maximum yield obtained from the reaction of 3-Bromo-2,3-dimethylpentane with ethanolic KOH
- (1) $\text{H}_2\text{C} = \text{C}(\text{CH}_3)\text{CH}_2\text{CH}_3$
 - (2) $\text{CH}_3\text{CH} = \text{C}(\text{CH}_3)\text{CH}(\text{CH}_3)_2$
 - (3) $(\text{CH}_3)_2\text{C} = \text{C}(\text{CH}_3)\text{CH}_2\text{CH}_3$
 - (4) All of these
22. Consider the following compounds :
1. $\text{CH}_3\text{-CH}_2\text{-CHCl-CH}_3$
 2. $\text{CH}_2 = \text{CH-CH}_2\text{-CH}_2\text{Cl}$
 3. $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{Cl}$
- These compounds are dehydrohalogenated by treatment with a strong base under identical conditions. The correct sequence of the increasing order of reactivity of these compounds in the given reaction is
- (1) 1, 2, 3
 - (2) 2, 1, 3
 - (3) 3, 1, 2
 - (4) None of these
23. Consider the following compounds :
- 4-Chlorobut-1-ene and 5-Chloropent-1-ene
- These compounds undergo dehydrohalogenation under identical conditions
- Select the correct statement from the following:
- (1) 5-Chloropent-1-ene is more reactive than 4-Chlorobut-1-ene in the dehydrohalogenation reaction
 - (2) 4-Chlorobut-1-ene is more reactive than 5-Chloropent-1-ene in the dehydrohalogenation reaction
 - (3) Both show the same reactivity in the dehydrohalogenation reaction
 - (4) In the beginning, 5-Chloropent-1-ene is more reactive than 4-Chlorobut-1-ene, but in the end, 4-Chlorobut-1-ene becomes more reactive.
24. When 2-Methylbutan-1-ol is dehydrated to give an alkene, the preferred product is
- (1) 2-Methylbut-1-ene
 - (2) 2-Methylbut-2-ene
 - (3) But-1-ene
 - (4) But-2-ene
25. Consider the following compounds :
1. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$
 2. $\text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CH}_3$
 3. $(\text{CH}_3)_3\text{COH}$
- These compounds are dehydrated by treatment with Sulphuric acid. The correct sequence of increasing order of the reactivity of three compounds towards dehydration is
- (1) 3, 1, 2
 - (2) 2, 1, 3
 - (3) 1, 2, 3
 - (4) 3, 2, 1
26. A cylinder of compressed gas that bears no label is supposed to contain either Ethane or Ethene. Combustion of the sample shows that 16 cm^3 of the gas require 48 cm^3 of Oxygen for complete combustion. This shows that the gas is :
- (1) Only ethane
 - (2) Only ethene
 - (3) 1 : 1 mixture of two gases
 - (4) Some unknown mixture of the two gases
27. The highest boiling point is expected for
- (1) iso-octane
 - (2) *n*-octane
 - (3) 2, 2, 3, 3-Tetramethylbutane
 - (4) *n*-Butane
28. Select the Z-isomer from the following alkenes:
- (1) 
 - (2) 
 - (3) 
 - (4) None of these
29. Which of the following reactions are highly selective towards addition reactions on alkenes.
- (a) HCl
 - (b) HBr
 - (c) Oxymercuration demercuration
 - (d) Hydroboration
- (1) a only
 - (2) c, d only
 - (3) a, b, c, d
 - (4) None of these

30. The compound which reacts with HBr obeying Markownikoffs rule is



31. 2-Methylpropene, when heated with acetyl chloride in presence of anhydrous Zinc chloride, gives



32. 2-Methylbut-1-ene reacts with mercuric acetate in the presence of water to form a product, which on reduction with NaBH_4 yields

- (1) 2-Methylbutan-2-ol
 (2) 2-Methylbutan-1-ol
 (3) 3-Methylbutan-2-ol
 (4) None of these

33. A hydrocarbon of molecular formula C_7H_{12} on catalytic hydrogenation over Platinum gives C_7H_{16} . The parent hydrocarbon adds Bromine and also reacts with $[\text{Ag}(\text{NH}_3)_2]\text{OH}$ to give precipitate. The parent hydrocarbon is

- (1) $\text{CH}_3\text{CH} = \text{CHCH} = \text{CHCH}_3$
 (2) $\text{CH}_3\text{CH}_2\text{C} \equiv \text{CCH}(\text{CH}_3)_2$
 (3) $(\text{CH}_3)_3\text{CCH}_2\text{C} \equiv \text{CH}$
 (4) None of these

34. Which of the following compounds reacts with CH_3Li to liberate Methane gas ?

- (1) C_2H_6 (2) $\text{CH}_3-\text{CH} = \text{CH}_2$
 (3) $\text{CH} \equiv \text{CH}$ (4) None of these

35. Cold and dil. KMnO_4 reacts with But-2-ene to form

- (1) Butane-1,4-diol
 (2) Butane-1,3-diol
 (3) Butane-2,3-diol
 (4) None of these

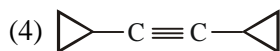
36. Hot and conc. KMnO_4 at 373–383 K reacts with Pent-2-ene to form

- (1) Propanoic acid only
 (2) Ethanoic acid only
 (3) A mixture of Propanoic acid and Ethanoic acid
 (4) None of these

37. A hydrocarbon (A), of formula C_8H_{10} , on Ozonolysis gives compound (B), $\text{C}_4\text{H}_6\text{O}_2$ only.

The compound (B) can also be obtained from alkyl bromide, (C), $\text{C}_3\text{H}_5\text{Br}$ upon treatment with magnesium in dry ether, followed by carbon dioxide and acidification. The compound (A) is

- (1) $\text{CH}_3-\text{CH}_2-\text{C} \equiv \text{C}-\text{C} \equiv \text{C}-\text{CH}_2-\text{CH}_3$
 (2) $\text{CH}_3-\text{C} \equiv \text{C}-\text{CH}_2-\text{C} \equiv \text{C}-\text{CH}_2-\text{CH}_3$
 (3) $\text{CH}_3-\text{C} \equiv \text{C}-\text{CH}_2-\text{CH}_2-\text{C} \equiv \text{C}-\text{CH}_3$

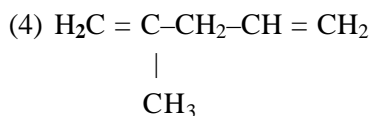
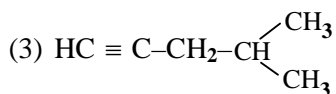
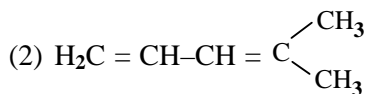
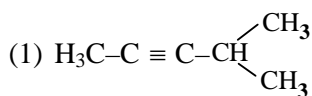


38. A hydrocarbon C_6H_{12} decolourises bromine solution and yield n-Hexane on hydrogenation.

On oxidation with KMnO_4 , it affords two different monobasic acid of the type RCOOH (R is an alkyl group). The compound is

- (1) Cyclohexene
 (2) Hex-1-ene
 (3) Hex-2-ene
 (4) Hex-3-ene

39. A hydrocarbon C_6H_{10} does not react with ammoniacal solution of Cu^+ ions; it adsorbs 2 mol of Hydrogen on catalytic hydrogenation to give 2-Methylpentane. The hydrocarbon adds one molecule of water on treatment with $\text{Hg}^{2+}/\text{H}_2\text{SO}_4$. The structure of given compound is



40. When Nitrobenzene is treated with Br_2 in presence of FeBr_3 , the major product is *m*-Bromonitrobenzene. The statement/s which is related to formation of *m*-isomer is
- The electron-density on meta Carbon is more than at ortho and para positions
 - The intermediate carbonium ion formed after initial attacked of Br^+ at the meta position is least destabilized
 - Loss of aromaticity when Br^+ attacks at ortho and para position and not at meta positions
- a only
 - b only
 - a, b, c
 - a and b

41. Match list I with list II and select the correct answer using the codes given below in the lists.

List I (Reagent)	List II (Electrophile)
a. $\text{Cl}_2 + \text{AlCl}_3$	1. NO_2 + δ - δ
b. $\text{HNO}_3 + \text{H}_2\text{SO}_4$	2. $\text{Cl} \cdot \text{Cl} \cdot \text{AlCl}_3$ or Cl^+
c. $\text{H}_2\text{S}_2\text{O}_7$ (or $\text{H}_2\text{SO}_4 + \text{SO}_3$)	3. SO_3H^+
d. $\text{Br}_2 + \text{FeBr}_3$	4. SO_3 + δ - δ
	5. $\text{Br} \dots \text{Br} \dots \text{FeBr}_3$ or Br^+

Codes : *a* *b* *c* *d*

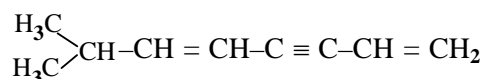
- | | | | | |
|-----|---|---|---|---|
| (1) | 2 | 3 | 1 | 4 |
| (2) | 2 | 1 | 3 | 5 |
| (3) | 2 | 1 | 4 | 5 |
| (4) | 4 | 3 | 2 | 1 |
42. Which one of the following compounds undergoes substitution at a slower rate than Benzene and yet yields predominantly ortho and para products?
- Nitrobenzene
 - Phenol
 - Chlorbenzene
 - Benzene sulphonic acid
43. The reaction of Toluene with chlorine in the presence of ferric Chloride gives predominately
- Benzoyl chloride
 - m*-chlorotoluene
 - Benzyl chloride
 - o*- and *p*-Chlorotoluene

44. Reaction of ethylbenzene with Bromine in presence of FeBr_3 gives
- 2-Bromoethyl-benzene
 - 3-Bromo-ethylbenzene
 - 4-Bromo-ethylbenzene
 - Both (1) and (3)
45. The most reactive species among the following towards the sulphonation is
- 1,3-Dimethylbenzene
 - Toluene
 - Chlorobenzene
 - Nitrobenzene
46. The hydrocarbon which decolourises alkaline KMnO_4 solution, but does not give any ppt. with ammonical Silver nitrate is
- Benzene
 - Acetylene
 - Propyne
 - Butyne-2
47. Match list I with list II and select the correct answer using the codes given below the lists :

List I (Petroleum fractions)	List II (Approximate composition)
(a) Gasoline	1. C_{10} to C_{15}
(b) Kerosene	2. C_6 to C_8
(c) Lubricating oil	3. C_{30} to C_{40}
(d) Pitch and asphalt	4. C_{17} to C_{20}

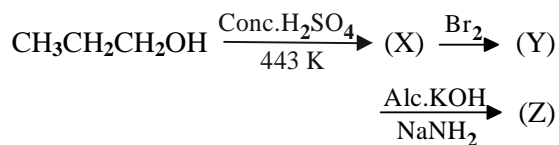
Codes : *a* *b* *c* *d*

- | | | | | |
|-----|---------------|---|---|---|
| (1) | 1 | 2 | 4 | 3 |
| (2) | 2 | 1 | 3 | 4 |
| (3) | 2 | 1 | 4 | 3 |
| (4) | None of these | | | |
48. Consider the given statements about the molecule:



- Three carbons are sp^3 -hybridized
 - Three carbons are sp^2 -hybridized
 - Two carbons are sp -hybridized
- Of these statements :
- 1, 2 and 3 all correct
 - 1 and 2 are correct
 - 2 and 3 are correct
 - 1 and 3 are correct
49. Catalytic-cracking of petroleum is done to
- Convert gaseous hydrocarbons into liquid fuel
 - Convert unsaturated hydrocarbons into saturated ones
 - Remove sulphur
 - Convert heavy distillate into lower boiling components

50. Identify 'Z' in the following reaction series:



- (1) $\text{CH}_3-\text{CH}(\text{NH}_2)-\text{CH}_2(\text{NH}_2)$ (2) $\text{CH}_3-\text{CH}(\text{OH})-\text{CH}_2(\text{OH})$
 (3) $\text{CH}_3-\text{C}(\text{OH})=\text{CH}_2$ (4) $\text{CH}_3-\text{C}\equiv\text{CH}$

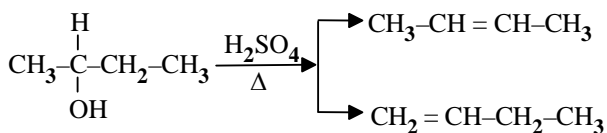
51. Which is the weakest acid among the following?

- (1) HCl (2) Acetylene
 (3) Phenol (4) Picric acid

52. An olefin on Ozonolysis yields a mixture of Acetone and Ethyl methyl ketone. The possible structure of olefin is :

- (1) $(\text{CH}_3)_2\text{C}=\text{C}(\text{CH}_3)\text{CH}_2\text{CH}_3$
 (2) $\text{CH}_3\text{CH}=\text{CHCH}_3$
 (3) $(\text{C}_2\text{H}_5)_2\text{C}=\text{CH}_2$
 (4) $(\text{CH}_3)_2\text{C}=\text{C}(\text{CH}_3)_2$

53. For the reaction :



- (1) $\text{CH}_3-\text{CH}=\text{CH}-\text{CH}_3$ predominates
 (2) $\text{CH}_2=\text{CH}-\text{CH}_2-\text{CH}_3$ predominates
 (3) Both are formed in equal amounts
 (4) None of these

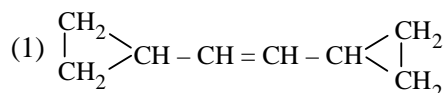
54. Treatment of Benzene with Ethanoyl chloride in presence of anhydrous aluminium chloride gives

- (1) Toluene (2) Acetophenone
 (3) Benzyl alcohol (4) *o*-cresol

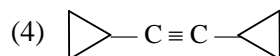
55. Olefins can be hydrogenated by

- (1) Zinc and HCl
 (2) Raney nickel and Hydrogen
 (3) Nascent hydrogen
 (4) LiAlH_4 in ether

56. A hydrocarbon A, of formula C_8H_{10} on Ozonolysis gives B ($\text{C}_4\text{H}_6\text{O}_2$) only. Structure of hydrocarbon is



- (2) $\text{CH}_2=\text{CH}-\text{CH}_2-\text{CH}=\text{CH}-\text{CH}_2-\text{CH}=\text{CH}_2$
 (3) $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}=\text{CH}-\text{CH}_2-\text{CH}_2-\text{CH}_3$



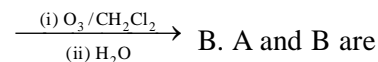
57. Which of the following reactions gives $\text{H}_2\text{C}=\text{C}=\text{CH}_2$?

- (1) $\text{CH}_2\text{Br}-\text{CHBr}=\text{CH}_2 \xrightarrow{\text{Zn}/\text{CH}_3\text{OH}}$
 (2) $\text{HC}\equiv\text{C}-\text{CH}_2-\text{COOH} \xrightarrow[40^\circ\text{C}]{\text{Aq. Na}_2\text{CO}_3}$
 (3) $\text{BrCH}_2-\text{C}\equiv\text{C}-\text{CH}_2\text{Br} \xrightarrow{\text{Zn, heat}}$
 (4) $2\text{CH}_2=\text{CH}-\text{CH}_2\text{I} + \text{Zn} \xrightarrow{\text{heat}}$

58. The product formed when vinylacetylene is passed through concentrated hydrochloric acid in presence of cuprous and ammonium chlorides is

- (1) $\text{ClCH}_2-\text{CH}_2-\text{C}\equiv\text{CH}$
 (2) $\text{CH}_3-\text{CHCl}-\text{C}\equiv\text{CH}$
 (3) $\text{CH}_2=\text{CH}-\text{CH}=\text{CHCl}$
 (4) $\text{CH}_2=\text{CH}-\text{CCl}=\text{CH}_2$

59. $\text{CH}_2=\text{CH}-\text{CH}=\text{CH}_2 \xrightarrow[1 \text{ equiv. } \Delta]{\text{H}_2/\text{Pt}} \text{A}$



- (1) $\text{CH}_3\text{CH}_2\text{CH}=\text{CH}_2$, ($\text{CH}_3\text{CH}_2\text{CO}_2\text{H} + \text{CO}_2$)
 (2) $\text{CH}_3\text{CH}=\text{CHCH}_3$, $\text{CH}_3\text{CO}_2\text{H}$ (2 moles)
 (3) $\text{CH}_3\text{CH}=\text{CHCH}_3$, CH_3CHO (2 moles)
 (4) $\text{CH}_3\text{CH}_2\text{CH}=\text{CH}_2$, ($\text{CH}_3\text{CH}_2\text{CHO} + \text{HCHO}$)

60. The correct order of reactivity towards the electrophilic substitution of the compound Aniline(I), Benzene (II) and Nitrobenzene (III) is

- (1) $\text{III} > \text{II} > \text{I}$ (2) $\text{II} > \text{III} > \text{I}$
 (3) $\text{I} < \text{II} < \text{III}$ (4) $\text{I} > \text{II} > \text{III}$

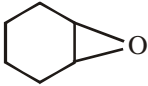
Assertion-Reason Type Questions (AIIMS)

Each of the questions given below consists of two statements, an assertion (A) and reason (R). Select the number corresponding to the appropriate alternative as follows

- (1) If both A and R are true and R is the correct explanation of A, then mark 1
- (2) If both A and R are true but R is not the correct explanation of A, then mark 2
- (3) If A is true but R is false, then mark 3
- (4) If both A and R are false, then mark 4

1. A. The IUPAC name for the compound, $\text{NCCH}_2\text{CH}_2\text{COOH}$ is Butane-3-nitrile-1-oic acid.

R. COOH is considered as substituent group while CN is considered as the principal functional group.

2. A. The IUPAC name for  is 7-Oxobicyclo [4.1.0] heptane.

R. The prefix oxo is used for the C=O group.

3. A. Cyclobutane is less stable than cyclopentane.

R. Presence of 'bent bonds' causes loss of orbital overlap.

4. A. cis-1, 3-Dihydroxycyclohexane exists in boat conformation.

R. In the form, there will not be hydrogen bonding between the two hydroxyl groups.

5. A. The carbocation $\text{CF}_3 - \overset{+}{\text{C}}\text{H}_2$ is less stable than $\overset{+}{\text{C}}\text{F}_3$.

R. In case of $\text{CF}_3 - \overset{+}{\text{C}}\text{H}_2$, the strongly electron withdrawing $-\text{CF}_3$ group intensifies the +ve charge but in case of $\overset{+}{\text{C}}\text{F}_3$, the lone pairs of electrons on each of the three F-atoms overlap with the empty *p*-orbital of the carbocation carbon with the empty *p*-orbital of the carbocation carbon thereby dispersing the +ve charge.

6. A. A triplet carbene is more stable than a singlet carbene, thermodynamically.

R. In triplet carbene, Carbon atom is *sp*-hybridized while in singlet carbene it is *sp*²-hybridized.

7. A. Allyl free radical is more stable than a simple alkyl free radical.

R. The allyl radical is stabilized by resonance.

8. A. Cyclohexane floats over water.

R. Most of the molecules of cyclohexane assume boat conformation.

9. A. Benzene does not decolourize Br_2 -water.

R. Benzene is stabilized by resonance due to delocalization of π -electrons.

10. A. Propene is more reactive than ethene towards electrophilic addition reactions.

R. Hyperconjugation effect of the CH_3 group increases the electron density in the double bond.

11. A. The boiling point of n-alkanes increases regularly with increase in number of carbon atoms.

R. The magnitude of van der Waal's forces of attraction increases with the increase in molecular mass and molecular size.

12. A. Both cyclopropane and propene give addition reactions readily.

R. Cyclopropane and propene are isomers of each other.

13. A. Addition of HBr to $\text{HC}\equiv\text{C}-\text{CH}_2-\text{CH}_2\text{CH}=\text{CH}_2$ gives $\text{HC}\equiv\text{C}-\text{CH}_2-\text{CHBr}-\text{CH}_3$ and not $\text{H}_2\text{C}=\text{CBr}-\text{CH}_2-\text{CH}=\text{CH}_2$.

R. A triple bond is less reactive than a double bond.

14. A. Propene reacts with perbenzoic acid to produce 1, 2-Epoxypropane.

R. In this reaction propene acts as a nucleophile.

15. A. *trans*-2-Butene on reaction with Br_2 gives *meso*-2, 3-dibromobutane.

R. The reaction involves syn addition of Bromine.

16. A. Both Toluene and isopropylbenzene give the same product on oxidation with KMnO_4 .

R. KMnO_4 oxidises side aliphatic chain of arenes to $-\text{COOH}$ group.

17. A. Acetylene reacts with sodamide to evolve H_2 gas.

R. Acetylene is a weaker acid than ammonia.

18. A. Benzene reacts with iodine monochloride in presence of anhyd. AlCl_3 to form iodobenzene.

R. Iodine monochloride reacts with anhyd. AlCl_3 to produce I^+ as the electrophile.

ANSWERS TO ASSIGNMENT

HYDROCARBONS

- | | | | | |
|---------|---------|---------|-----------|---------|
| 1. (2) | 2. (2) | 3. (3) | 4. (2) | 5. (3) |
| 6. (1) | 7. (3) | 8. (2) | 9. (1) | 10. (3) |
| 11. (2) | 12. (2) | 13. (3) | 14. (1) | 15. (3) |
| 16. (4) | 17. (4) | 18. (2) | 19. (3) | 20. (2) |
| 21. (3) | 22. (3) | 23. (2) | 24. (2) | 25. (3) |
| 26. (2) | 27. (2) | 28. (3) | 29. (2) | 30. (4) |
| 31. (4) | 32. (3) | 33. (3) | 34. (3) | 35. (3) |
| 36. (3) | 37. (4) | 38. (3) | 39. (1) | 40. (4) |
| 41. (3) | 42. (3) | 43. (4) | 44. (1,3) | 45. (2) |
| 46. (1) | 47. (2) | 48. (3) | 49. (4) | 50. (4) |
| 51. (2) | 52. (3) | 53. (1) | 54. (2) | 55. (4) |
| 56. (1) | 57. (1) | 58. (4) | 59. (4) | 60. (3) |

ASSERTION-REASON TYPE QUESTIONS (FOR AIIMS)

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

Questions from Competitive Examinations


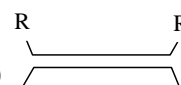
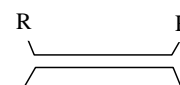
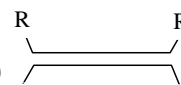
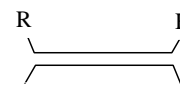
CBSE – PMT (Pre.)

- From the following bond energies
 (1) H–H bond energy: 431.37 kJ mol⁻¹
 (2) C = C bond energy: 606.10 kJ mol⁻¹
 (3) C – C bond energy: 336.49 kJ mol⁻¹
 (4) C – H bond energy: 410.50 kJ mol⁻¹
 Enthalpy for the reaction;

$$\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{C} = \text{C} + \text{H} - \text{H} \\ | \quad | \\ \text{H} \quad \text{H} \end{array} \rightarrow \begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{H} - \text{C} - \text{C} - \text{H} \\ | \quad | \\ \text{H} \quad \text{H} \end{array}$$
 will be
 (1) 553.0 kJ mol⁻¹ (2) 1523.6 kJ mol⁻¹
 (3) -243.6 kJ mol⁻¹ (4) -120.0 kJ mol⁻¹
- The IUPAC name of the compound having the formula CH₃CH=CHC≡CH is:
 (1) 1-Butene-3-yne (2) 3-Butene-1-yne
 (3) 1-Butyn-3-ene (4) But-1-yne-3-ene
- Which of the following compounds will exhibit *cis-trans* (geometrical) isomerism?
 (1) 2-Butanol (2) 2-Butene
 (3) Butanol (4) 2-Butyne
- Benzene reacts with CH₃Cl in the presence of anhydrous AlCl₃ to form:
 (1) Xylene (2) Toluene
 (3) Chlorobenzene (4) Benzylchloride
- Which of the following reactions is an example of nucleophilic substitution reaction?
 (1) RX + Mg → RMgX
 (2) RX + KOH → ROH + KX
 (3) 2RX + 2Na → R-R + 2NaX
 (4) RX + H₂ → RH + HX
- The relative reactivities of acyl compounds towards nucleophilic substitution are in the order of
 (1) Acyl chloride > Acid anhydride > Ester > Amide
 (2) Ester > Acyl chloride > Amide > Acid anhydride
 (3) Acid anhydride > Amide > Ester > Acyl chloride
 (4) Acyl chloride > Ester > Acid anhydride > Amide
- Which one of the following is most reactive towards electrophilic attack?



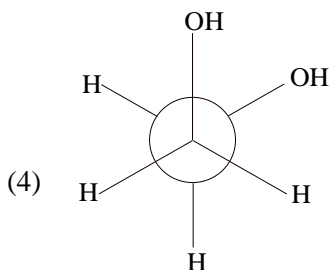
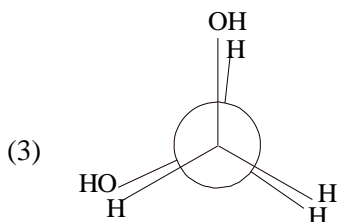
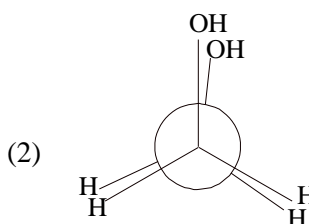
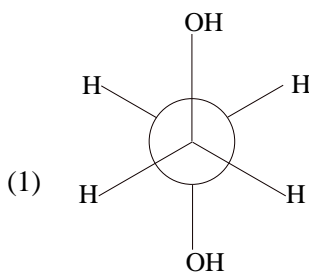
- In a S_N2 substitution reaction of the type R-Br + Cl⁻ $\xrightarrow{\text{DMF}}$ R-Cl + Br⁻, which one of the following has the highest relative rate?
 (1) CH₃-CH₂-CH₂Br
 (2) $\begin{array}{c} \text{CH}_3 - \text{CH} - \text{CH}_2\text{Br} \\ | \\ \text{CH}_3 \end{array}$
 (3) $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 - \text{C} - \text{CH}_2\text{Br} \\ | \\ \text{CH}_3 \end{array}$
 (4) CH₃CH₂Br
- H₃C- $\begin{array}{c} \text{CH} - \text{CH} = \text{CH}_2 \\ | \\ \text{CH}_3 \end{array}$ + HBr → A; A (predominantly) is
 (1) $\begin{array}{c} \text{CH}_3 - \text{CH} - \text{CH}_2 - \text{CH}_2\text{Br} \\ | \\ \text{CH}_3 \end{array}$
 (2) $\begin{array}{c} \text{Br} \\ | \\ \text{CH}_3 - \text{C} - \text{CH}_2\text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$
 (3) $\begin{array}{c} \text{CH}_3 - \text{CH} - \text{CH} - \text{CH}_3 \\ | \quad | \\ \text{Br} \quad \text{CH}_3 \end{array}$
 (4) $\begin{array}{c} \text{CH}_3 - \text{CH} - \text{CH} - \text{CH}_3 \\ | \quad | \\ \text{CH}_3 \quad \text{Br} \end{array}$
- Base strength of
 (a) H₃C-CH₂ (b) H₂C = ⁻CH
 (c) H-C≡C⁻
 is in the order of

- (1) (b) > (a) > (c) (2) (c) > (b) > (a)
 (3) (a) > (c) > (b) (4) (a) > (b) > (c)
11. What volume of Oxygen gas (O₂) measured at 0°C and 1 atm, is needed to burn completely 1 L of Propane gas (C₃H₈) measured under the same conditions?
 (1) 7 L (2) 6 L
 (3) 5 L (4) 10 L
12. How many stereoisomers does this molecule have? CH₃CH = CHCH₂CHBrCH₃
 (1) 4 (2) 6
 (3) 8 (4) 2
13. An organic compound contains Carbon, Hydrogen and Oxygen. Its elemental analysis gave C, 38.71% and H, 9.67%. The empirical formula of the compound would be
 (1) CH₃O (2) CH₂O
 (3) CHO (4) CH₄O
14. The stability of carbanions in the following
 (a) RC = $\overset{\ominus}{C}$ (b) 
 (c) R₂C = $\overset{\ominus}{C}H$ (d) R₃C - $\overset{\ominus}{C}H_2$
 is in the order of
 (1) (a) > (b) > (c) > (d)
 (2) (b) > (c) > (d) > (a)
 (3) (d) > (b) > (c) > (a)
 (4) (a) > (c) > (b) > (d)
15. $H_3C - \underset{\substack{| \\ CH_3}}{CH} - CH = CH_2 + HBr \rightarrow A$;
 A (predominantly) is
 (1) $CH_3 - \underset{\substack{| \\ CH_3}}{CH} - CH_2 - CH_2Br$
 (2) $CH_3 - \underset{\substack{| \\ CH_3}}{\overset{\substack{| \\ Br}}{C}} - CH_2CH_3$
 (3) $CH_3 - \underset{\substack{| \\ Br}}{CH} - \underset{\substack{| \\ CH_3}}{CH} - CH_3$
 (4) $CH_3 - \underset{\substack{| \\ CH_3}}{CH} - \underset{\substack{| \\ Br}}{CH} - CH_3$
16. Predict the product C obtained in the following reaction of butyne-1.
 $CH_3CH_2 - C \equiv CH + HCl \longrightarrow B \xrightarrow{HI} C$
 (1) $CH_3 - CH_2 - CH_2 - \underset{\substack{| \\ Cl}}{\overset{\substack{| \\ I}}{C}} - H$
 (2) $CH_3 - CH_2 - \underset{\substack{| \\ I}}{CH} - CH_2Cl$
 (3) $CH_3CH_2 - \underset{\substack{| \\ Cl}}{\overset{\substack{| \\ I}}{C}} - CH_3$
 (4) $CH_3 - \underset{\substack{| \\ Cl}}{CH} - CH_2CH_2I$
17. Which of the compounds with molecular formula C₅H₁₀ yields Acetone on Ozonolysis?
 (1) 3-Methyl-1-butene
 (2) Cyclopentane
 (3) 2-Methyl-1-butene
 (4) 2-Methyl-2-butene
18. The order of decreasing reactivity towards an electrophilic reagent, for the following
 (a) Benzene (b) Toluene
 (c) Chlorobenzene and (d) Phenol
 (1) b > d > a > c (2) d > c > b > a
 (3) d > b > a > c (4) a > b > c > d
19. The correct order regarding the electronegativity of hybrid orbitals of Carbon is [CBSE 2006]
 (1) sp < sp² > sp³ (2) sp < sp² < sp³
 (3) sp > sp² < sp³ (4) sp > sp² > sp³
20. Which one of the following alkenes will react faster with H₂ under catalytic hydrogenation conditions?
 (1)  (2) 
 (3)  (4) 
 (R = Alkyl Substituent)
21. Products of the following reaction
 $CH_3C \equiv C.CH_2CH_3 \xrightarrow{(1) O_3} \text{are} \xrightarrow{(2) \text{Hydrolysis}}$

- (1) $\text{CH}_3\text{COOH} + \text{CH}_3\text{COCH}_3$
 (2) $\text{CH}_3\text{COOH} + \text{HOOC} \cdot \text{CH}_2\text{CH}_3$
 (3) $\text{CH}_3\text{CHO} + \text{CH}_3\text{CH}_2\text{CHO}$
 (4) $\text{CH}_3\text{COOH} + \text{CO}_2$
22. Reaction of HBr with propene in the presence of peroxide gives
 (1) n-Propyl bromide (2) Isopropyl bromide
 (3) 3-Bromo propane (4) Allyl bromide
23. Using anhydrous AlCl_3 as catalyst, which one of the following reactions produces ethylbenzene (PhEt) ?
 (1) $\text{H}_3\text{C} - \text{CH}_3 + \text{C}_6\text{H}_6$
 (2) $\text{H}_3\text{C} - \text{CH}_2\text{OH} + \text{C}_6\text{H}_6$
 (3) $\text{CH}_3 - \text{CH} = \text{CH}_2 + \text{C}_6\text{H}_6$
 (4) $\text{H}_2\text{C} = \text{CH}_2 + \text{C}_6\text{H}_6$

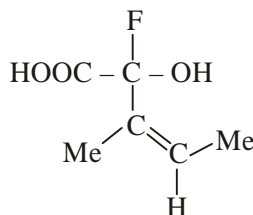
CBSE – PMT (Main)

1. Which of the following conformers for ethylene glycol is most stable?

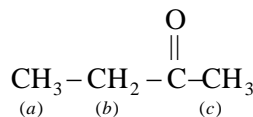


DPMT

1. Chlorobenzene is?..... reactive than benzene towards electrophilic substitution and directs the incoming electrophile to the?.....position.
 (1) more, ortho/para (2) less, ortho/para
 (3) more, meta (4) less, meta
2. Which of the following compounds will show geometric isomerism?
 (1) Cyclohexene
 (2) 2-Hexene
 (3) 3-Hexyne
 (4) 1,1-Diphenyl ethylene
3. Which of the following compounds gives blood red coloration when its Lassaigne's extract is treated with alkali and ferric chloride?
 (1) Thiourea (2) Diphenyl sulfide
 (3) Phenyl hydrazine (4) Benzamide
4. The configuration of the chiral centre and the geometry of the double bond in the following molecule can be described by



- (1) R and E (2) S and E
 (3) R and Z (4) S and Z
5. Which of the following is chiral [DPMT 2008]
 (1) $\text{Cl} - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$
 (2) $\text{CH}_3 - \text{CH}_2 - \underset{\text{Cl}}{\text{CH}} - \text{CH}_2 - \text{CH}_3$
 (3) $\text{Cl} - \text{CH} = \text{CH} - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$
 (4) $\text{H} - \underset{\text{Cl}}{\text{C}} = \text{C} = \text{CH} - \text{CH}_2 - \text{CH}_3$
6. In the given compound which of the following Hydrogen is most acidic

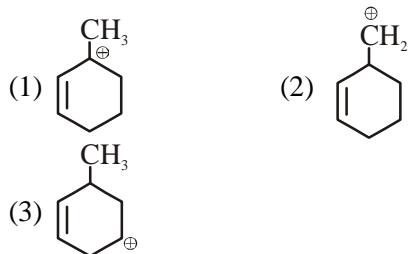


- (1) only (a) (2) only (b)
 (3) only (c) (4) both (b) and (c)

7. Empirical formula of compound having molar mass 58 is C_2H_5 number of structural isomers possible are

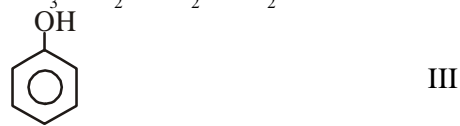
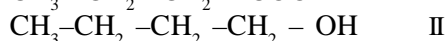
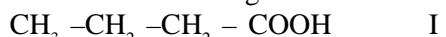
(1) 1 (2) 2
(3) 3 (4) 4

8. Most stable among the following is



(4) all are equally stable

9. Arrange the following acids in decreasing order of acidic strength



(1) I > II > III > IV (2) III > IV > II > I

(3) I > III > IV > II (4) I > III > II > IV

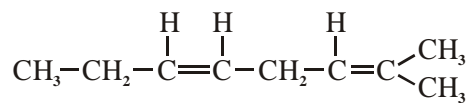
10. Which of the following gives HCHO on Ozonolysis?



(3) both (1) & (2)

(4) none of these

11. Number of geometrical isomers for the following structure



will be

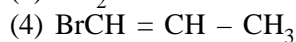
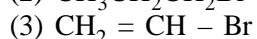
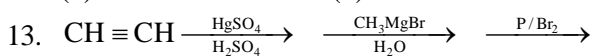
(1) 2 (2) 3

(3) 4 (4) 5

12. Ethene + Bromine, Chloride ion, Nitrate ion, number of products

(1) 1 (2) 2

(3) 3 (4) 4

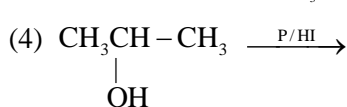
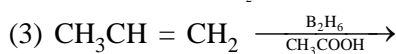
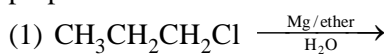


14. The reagent in Friedel Craft's reaction is

(1) Pyridine (2) $RCOCl$

(3) $RCOOH$ (4) HCl

15. Which of the following reactions will not give propane ?



16. The order of rate of hydrolysis of alkyl halides 1° , 2° , 3° and CH_3X by the S_N2 pathway is

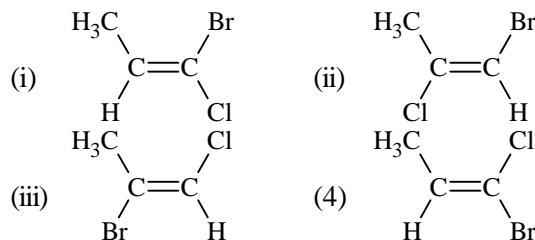
(1) $1^\circ > 2^\circ > 3^\circ > CH_3X$

(2) $CH_3X > 3^\circ > 2^\circ > 1^\circ$

(3) $CH_3X > 1^\circ > 2^\circ > 3^\circ$

(4) $3^\circ > 2^\circ > 1^\circ > CH_3X$

17. Which of the following is a pair of geometric isomers?



(1) (i) and (ii)

(2) (i) and (iii)

(3) (i) and (iv)

(4) (ii) and (iii)

AIIMS

1. Which of the following sequence of reactions (reagents) can be used for the conversion of $C_6H_5CH_2CH_3$ into $C_6H_5CH = CH_2$?

(1) $SOCl_2$; H_2O

(2) SO_2Cl_2 ; alc. KOH

(3) $Cl_2/h\nu$; H_2O

(4) $SOCl_2$; alc. KOH

2. Which of the following gives propyne on hydrolysis?

(1) Al_4C_3

(2) Mg_2C_3

(3) B_4C

(4) La_4C_3

ANSWERS :

QUESTIONS FROM COMPETITIVE EXAMS

CBSE

- | | | | |
|---------|---------|---------|---------|
| 1. (4) | 2. (1) | 3. (2) | 4. (2) |
| 5. (2) | 6. (1) | 7. (3) | 8. (4) |
| 9. (2) | 10. (4) | 11. (3) | 12. (1) |
| 13. (1) | 14. (2) | 15. (2) | 16. (3) |
| 17. (4) | 18. (3) | 19. (4) | 20. (2) |
| 21. (2) | 22. (1) | 23. (2) | |

CBSE – PMT (Main)

1. (4)

DPMT

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

AIIMS

1. (2) 2. (2)