CLASS XI CHE CH: 9

SET 1 – Hydrocarbons (MCQs)

1. Hydrocarbons are compounds of –
   a) Carbon and hydrogen only
   b) Carbon, hydrogen and oxygen
   c) Carbon and nitrogen
   d) Carbon, hydrogen and chlorine

2. LPG mainly contains –
   a) Ethane and methane
   b) Propane and butane
   c) Ethene and acetylene
   d) Methane and ethene

3. CNG stands for –
   a) Compressed Nitrogen Gas
   b) Compressed Natural Gas
   c) Combined Natural Gas
   d) Central Natural Gas

4. Hydrocarbons are classified based on –
   a) Type of carbon atoms
   b) Type of carbon–carbon bonds
   c) Molecular weight
   d) Density

5. Saturated hydrocarbons contain –
   a) Single bonds only
   b) Double bonds
   c) Triple bonds
   d) Aromatic rings

6. Unsaturated hydrocarbons contain –
   a) Only single bonds
   b) Double or triple bonds
   c) No carbon atoms
   d) Only π bonds

7. Aromatic hydrocarbons are –
   a) Open chain compounds
   b) Closed chain compounds with delocalised π-electrons
   c) Saturated compounds
   d) Aliphatic compounds

8. The general formula of alkanes is –
   a) CnH2n
   b) CnH2n+2

c) C_nH_{2n-2}
d) C_nH_n

9. The first member of the alkane series is –
a) Methane
b) Ethane
c) Propane
d) Butane

10. The bond angle in methane is –
a) 120°
b) 180°
c) 109.5°
d) 90°

11. In methane, carbon atom is –
a) sp^2 hybridised
b) sp^3 hybridised
c) sp hybridised
d) Unhybridised

12. Alkanes are also called –
a) Paraffins
b) Olefins
c) Acetylenes
d) Aromatics

13. The general formula of alkyl group is –
a) C_nH_{2n+1}
b) C_nH_{2n}
c) C_nH_{2n-2}
d) C_nH_{2n-1}

14. The simplest alkyl group is –
a) Methyl
b) Ethyl
c) Propyl
d) Butyl

15. C_4H_{10} has how many chain isomers?
a) 1
b) 2
c) 3
d) 4

16. The two isomers of butane are –
a) n-Butane and isobutane
b) Propane and butane

c) Ethane and propane
d) Methane and ethane

17. The boiling point of alkanes increases with –
a) Decrease in molecular weight
b) Increase in molecular weight
c) Number of π-bonds
d) Branching

18. The general molecular formula of alkanes in homologous series differs by –
a) CH_2
b) H_2
c) COOH
d) O_2

19. n-Hexane on isomerisation gives –
a) Hex-1-ene
b) 2-Methylpentane and 3-Methylpentane
c) Cyclohexane
d) Benzene

20. Alkanes are –
a) Polar molecules
b) Non-polar molecules
c) Ionic
d) Amphoteric

21. Alkanes are soluble in –
a) Water
b) Alcohol
c) Non-polar solvents
d) Acids

22. The process of adding hydrogen to alkenes to form alkanes is called –
a) Dehydrogenation
b) Hydrogenation
c) Oxidation
d) Pyrolysis

23. The catalyst used in hydrogenation is –
a) Ni, Pd or Pt
b) Cu
c) Fe
d) $AlCl_3$

24. The reaction of sodium salts of carboxylic acids with soda lime gives –
a) Alkene
b) Alkyne

c) Alkane
d) Acid

25. This reaction (Q24) is called –
a) Decarboxylation
b) Dehydration
c) Dehydrohalogenation
d) Dehydrogenation

26. Kolbe's electrolytic method is used to prepare –
a) Alkanes
b) Alkenes
c) Alkynes
d) Aromatics

27. The Wurtz reaction involves –
a) Alkyl halides and Na in dry ether
b) Alcohols and Na in water
c) Alkynes and Na in ammonia
d) Acids and NaOH

28. In Wurtz reaction, the product has –
a) Same number of carbon atoms
b) Even number of carbon atoms
c) Odd number of carbon atoms
d) Half the carbon atoms

29. The reaction $CH_3Cl + 2Na + ClCH_3 \rightarrow C_2H_6 + 2NaCl$ is –
a) Hydrogenation
b) Wurtz reaction
c) Substitution
d) Addition

30. The oxidation of isobutane gives –
a) 2-Methylpropane
b) 2-Methylpropan-2-ol
c) 2-Methylbutane
d) Methanol

31. The combustion of alkanes produces –
a) CO_2 and H_2O
b) CO and H_2
c) C and H_2
d) CO_2 and O_2

32. Methane burns in limited supply of oxygen to form –
a) CO_2
b) CO

c) C
d) CH_3OH

33. During chlorination of methane, the reaction proceeds via –
a) Electrophilic addition
b) Free radical mechanism
c) Nucleophilic substitution
d) Ionic mechanism

34. The first step in chlorination of methane is –
a) Termination
b) Propagation
c) Initiation
d) Oxidation

35. The major byproduct of chlorination of methane is –
a) Ethane
b) Ethene
c) Ethyne
d) None

36. Alkanes are used as –
a) Fuels
b) Dyes
c) Catalysts
d) Oxidants

37. In Kolbe's electrolytic method, methane cannot be prepared because –
a) It forms ethane instead
b) Reaction is incomplete
c) NaOH reacts with water
d) It forms CO_2

38. The term "paraffin" means –
a) High reactivity
b) Low reactivity
c) High solubility
d) High affinity

39. The carbon attached to four other carbons is called –
a) Primary carbon
b) Secondary carbon
c) Tertiary carbon
d) Quaternary carbon

40. The reaction used for industrial preparation of dihydrogen gas is –
a) Steam reforming of methane
b) Kolbe's electrolysis

c) Pyrolysis
d) Hydrogenation

41. Methane reacts with steam at 1273 K in presence of Ni to give –
a) $CO + 3H_2$
b) $CO_2 + H_2$
c) $C + H_2O$
d) $CO_2 + O_2$

42. The process of breaking higher alkanes into smaller ones is –
a) Polymerisation
b) Pyrolysis
c) Oxidation
d) Substitution

43. The reaction $CH_4 + Cl_2 \rightarrow CH_3Cl + HCl$ needs –
a) Darkness
b) UV light
c) Catalyst
d) Water

44. Which of the following shows conformations due to C–C rotation?
a) Methane
b) Ethane
c) Ethene
d) Ethyne

45. The most stable conformation of ethane is –
a) Eclipsed
b) Skew
c) Staggered
d) Linear

46. The energy difference between staggered and eclipsed ethane is about –
a) 5 kJ/mol
b) 12.5 kJ/mol
c) 25 kJ/mol
d) 50 kJ/mol

47. The repulsive interaction between electron clouds in ethane is called –
a) Steric strain
b) Torsional strain
c) Angle strain
d) Bond strain

48. The conformation with minimum energy is –
a) Eclipsed
b) Staggered

c) Skew
d) Twisted

49. The structure used to represent ethane along C–C axis is called –
a) Sawhorse projection
b) Newman projection
c) Fischer projection
d) Lewis structure

50. In alkanes, C–C bond length is approximately –
a) 120 pm
b) 134 pm
c) 154 pm
d) 180 pm

✅ Answers – SET 1

1–a	2–b	3–b	4–b	5–a	6–b	7–b	8–b	9–a	10–c
11–b	12–a	13–a	14–a	15–b	16–a	17–b	18–a	19–b	20–b
21–c	22–b	23–a	24–c	25–a	26–a	27–a	28–b	29–b	30–b
31–a	32–b	33–b	34–c	35–a	36–a	37–a	38–b	39–d	40–a
41–a	42–b	43–b	44–b	45–c	46–b	47–b	48–b	49–b	50–c