Carbon and Its Compounds

Assertion & Reason Type Questions

Directions: Each of the following questions consists of two statements, one is Assertion (A) and the other is Reason (R). Give answer:

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q1. Assertion (A): Covalent compounds have generally low melting and boiling points.

Reason (R): Covalent compounds are soluble in water.

Answer : (c) Reason (R) is false because covalent compounds are soluble in organic solvents like benzene and insoluble in water.

Q2. Assertion (A): Diamond is a good conductor of electricity and heat.

Reason (R): In diamond, each carbon atom is bonded to four other carbon atoms forming a rigid 3-D structure.

Answer : (d) Assertion (A) is false because diamond is a bad conductor of electricity and good conductor of heat.

Q3. Assertion (A): Benzene is an unsaturated cyclic hydrocarbon.

Reason (R): Benzene has a six-carbon ring structure and has 3 carbon-carbon double bonds.

Answer : (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

Q4. Assertion (A): Following are the structural isomers of butane.







Reason (R): Structural isomers have the same molecular formula, but they differ in their structures.

Answer : (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

Q5. Assertion (A): Alcohols have similar chemical properties.

Reason (R): All alcohols contain similar -OH functional group.

Answer : (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

Q6. Assertion (A): Following are the members of a homologous series:

CH₃OH, CH₃CH₂OH, CH₃CH₂CH₂OH

Reason (R): A series of compounds with same functional group, but differing by -CH₂unit is called a homologous series. **(CBSE 2020)**

Answer : (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

Q7. Assertion (A): Saturated hydrocarbons burn with a blue flame.

Reason (R): Saturated hydrocarbons contain less carbon content, so there is a complete combustion of these compounds.

Answer : (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

Q8. Assertion(A) : Carbon is the only element that can form large number of compounds.

Reason (R) : Carbon is tetravalent and shows the property of catenation.

Answer: (d)



Q9. Assertion(A) : If the first member of a homologous series is methanal, its third member will be propanal.

Reason (R) : All the members of a homologous series show similar chemical properties.

Answer: (b)

Q10. Assertion(A) : Diamond and graphite are allotropes of carbon.

Reason (R) : Some elements can have several different structural forms while in the same physical state. These forms are called allotropes.

Answer: (a)

Q11. Assertion(A) : Soaps are not suitable for washing purpose when water is hard.

Reason (R) : Soaps have relatively weak cleansing action.

Answer: (b)

Q12. Assertion(A) : Carbon compounds can form chain, branched and ring structures.

Reason (R) : Carbon exhibits the property of catenation.

Answer: (a)

Q13. Assertion (A) : Carbon monoxide is extremely poisonous in nature.

Reason (R) : Carbon monoxide is formed by complete combustion of carbon.

Answer: (c)

Q14. Assertion (A) : Cooking oil decolourises bromine water.

Reason (R) : Cooking oil is a saturated compound.

Answer:(b)

Q15. Assertion (A) : In a candle, wax vapours burn in sufficient supply of oxygen, which leads to blue flame.

Reason (R): When the oxygen supply is sufficient, then fuels burn completely producing a blue flame.

Answer: (a)

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Q16. Assertion (A) : Alkanes give addition reaction.

Reason (R) : Addition reactions are a characteristic property of unsaturated hydrocarbons.

Answer: (d)

Q17. Assertion(A): n-butane and iso-butane are examples of isomers.

Reason (R) : Isomerism is possible only with hydrocarbons having 4 or more carbon atoms.

Answer: (b)

Q18. Assertion(A): Saturated hydrocarbons are chemically less reactive.

Reason (R) : All the valencies of carbon atom are satisfied by single covalent bonds.

Answer: (a)

Q19. Assertion(A): Diamond and graphite do not have the same crystal structure.

Reason (R) : Diamond is crystalline while graphite is amorphous.

Answer: (c)

Q20. Assertion(A): Graphite is soft and slippery to touch.

Reason (R) : Graphite has sheet like layered structure.

Answer: (a)

Q21. Assertion(A): Both aldehydes and ketones contain carbonyl group.

Reason (R) : In aldehydes, the functional group is attached to atleast one hydrogen atom.

Answer: (b)

Q22. Assertion(A): In alkanes, alkenes and alkynes the valency of carbon is always four.

Reason (R) : All hydrocarbons except alkanes contain double bonds.

Answer: (c)





Q23. Assertion(A): Graphite is a good conductor of electricity.

Reason (R): It has one free valence electron.

Answer: (a)

Q24. Assertion(A): The functional group present in alcohols is – OH.

Reason (R) : It is the same group as present in water, hence water and alcohol have similar properties.

Answer: (c)

Q25. Assertion(A): Ethanol is first member of the alcohol homologous series.

Reason (R) : A homologous series can be represented by a general formula.

Answer: (d)

Q26. Assertion(A): Carbon and its compounds can be used as fuels.

Reason (R) : They are highly inflammable and have high calorific value. **Answer :** (a)

Q27. Assertion(A): Covalent compounds are generally poor conductor of electricity.

Reason (R) : They consist of molecules and not ions which can transfer charge.

Answer: (a)

Q28. Assertion(A): Diamond is not good conductor of electricity.

Reason (R): It has no free electrons.

Answer: (a)

Q.29. Assertion(A): Olefins have the general formula CnH2n+1

Reason (R) : There is at least one double bond between two carbon atoms in their molecules.

Answer: (d)

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Q30. Assertion(A): Carbon possesses property of catenation.

Reason (R) : Carbon atoms form double as well as triple bonds during catenation.

Answer: (b)

Q31. Assertion(A): Two members of a homologous series have similar chemical properties.

Reason (R) : Propane and butane are members of same homologous series.

Answer: (b)

Q32. Assertion(A): Diamond is the hardest natural known substance.

Reason (R) : Diamond is used for cutting marble, granite and glass.

Answer: (b)

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