



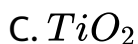
CHEMISTRY

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AIIMS 2003

Chemistry

1. The paramagnetic species is



D. BaO_2

Answer: A



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2. The reagent commonly used to determine hardness of water titrimetrically is :

- A. Oxalic acid
- B. Disodium salt of EDTA
- C. Sodium citrate
- D. Sodium thiosulphate.

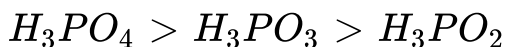
Answer: B



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3. The true statement of the acids of phosphorus H_3PO_2 , H_3PO_3 and H_3PO_4 is

A. The order of their acidity is



B. All of them are reducing in nature

C. All of them are tribasic acids

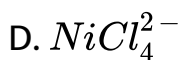
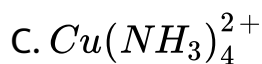
D. The geometry of phosphorus is tetrahedral in all the three.

Answer: D



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4. The ion which is not tetrahedral in shape is

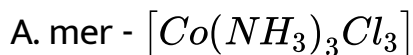


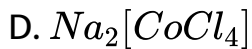
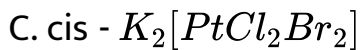
Answer: C



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5. The complex used as an anticancer agent is



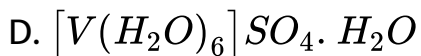
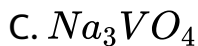


Answer: B



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6. The colourless species is



Answer: C

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7. MnO_4^{2-} (1 mole) in neutral aqueous medium is disproportionate to

A. $2/3$ mole of MnO_4^- and $1/3$ mole of MnO_2

B. $1/3$ mole of MnO_4^- and $2/3$ mole of MnO_2

C. $1/3$ mole of Mn_2O_7 and $1/3$ mole of MnO_2

D. $2/3$ mole of Mn_2O_7 and $1/3$ mole of MnO_2

Answer: A

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8. Lanthanide for which +II and +III oxidation states are common is

A. La

B. Nd

C. Ce

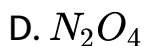
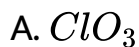
D. Eu

Answer: D



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9. The mixture of concentrated HCl and HNO_3 made in 3:1 ratio contains



Answer: B



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10. On dissolving moderate amount of sodium metal in liquid ammonia at low temperature, which of the following does not occur ?

A. Blue coloured solution is obtained

B. Na^+ ions are formed in the solution

C. Liquid NH_3 becomes good conductor of electricity

D. Liquid ammonia remains diamagnetic.

Answer: D

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11. The ligand called π acid is

A. CO

B. NH_3

C. $C_2O_4^{2-}$

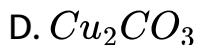
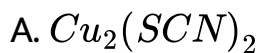
D. Ethylene diamine

Answer: A



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12. The compound used for gravimetric estimation of $Cu(II)$ is:



Answer: A



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13. In the extraction of Cu from its sulphide ore, the metal is formed by reduction of Cu_2O with

A. FeS

B. CO

C. Cu_2S

D. SO_2

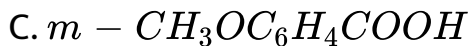
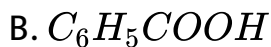
Answer: A



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14. Among the following the strongest acid is

A. CH_3COOH

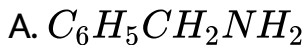


Answer: C



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15. Among the following the weakest base is .

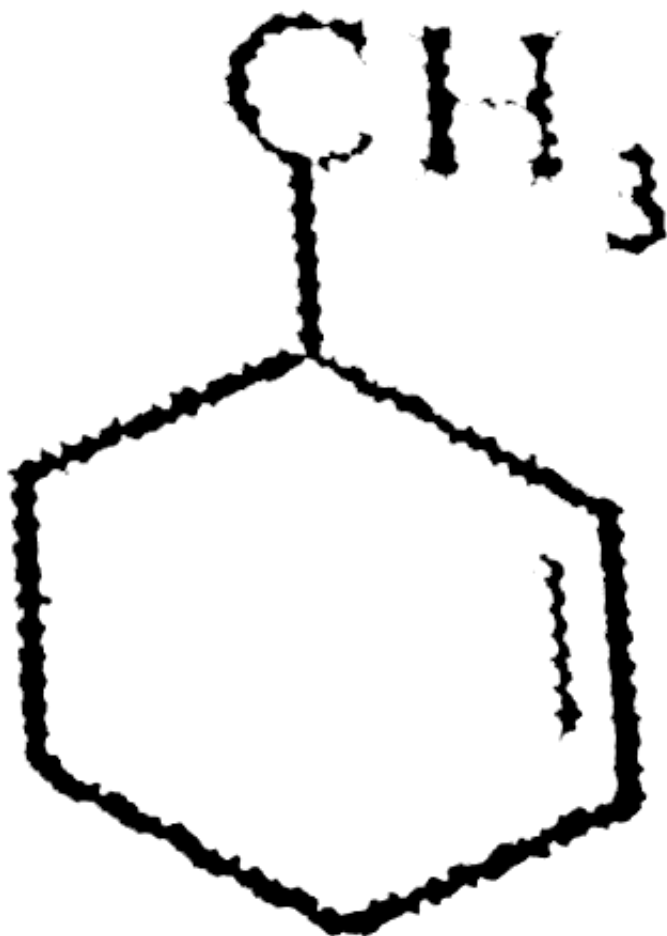


Answer: C



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16. IUPAC name of



is

A. 3-methyl cyclohexene

B. 1-methyl cyclohex-2-ene

C. 6-methyl cyclohexene

D. 1-methyl cyclohex-5-ene

Answer: A



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17. Intermolecular hydrogen bonding is strongest in

A. Methylamine

B. Phenol

C. Formaldehyde

D. Methanol

Answer: D



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18. The ortho/para directing group among the following is

A. COOH

B. CN

C. COCH_3

D. NHCOCH_3

Answer: D



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

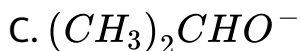
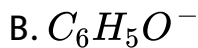
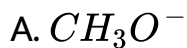
- A. Iso-butyl benzene
- B. Teri- butyl benzene
- C. n-butyl benzene
- D. No reaction

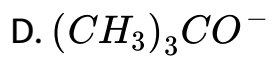
Answer: B



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20. Which of the following alkoxides is the most reactive nucleophile?



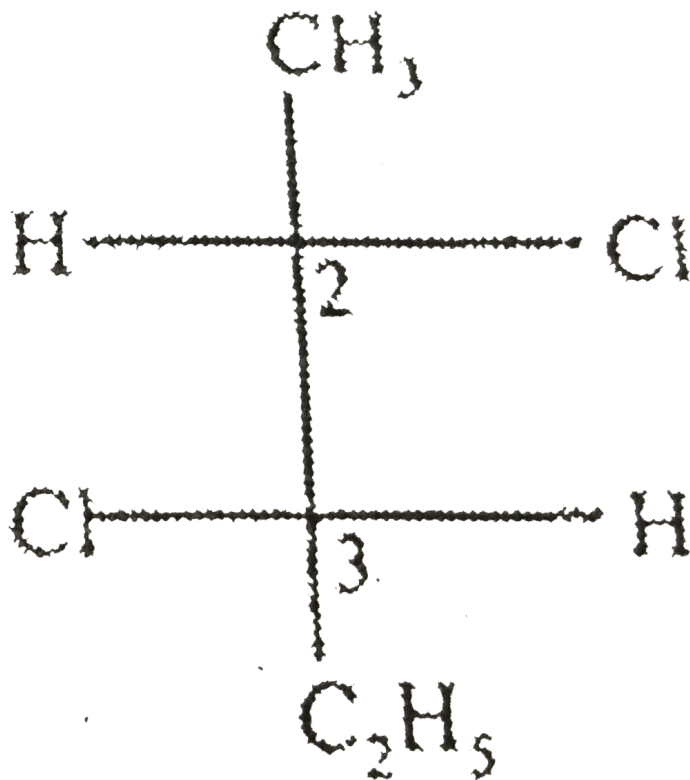


Answer: D



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21. The absolute configuration of the following compound is



A. 2 S, 3 R

B. 2 S, 3 S

C. 2 R, 3 S

D. 2 R, 3 R

Answer: B



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22. Subunits present in haemoglobin are:

A. 2

B. 3

C. 4

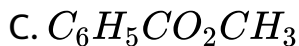
D. 5

Answer: C



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23. At higher temperature, iodoform reaction is given by:



Answer: B



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24. Among the following the achiral amino acid is:

A. 2 - ethylalanine

B. 2 - methylglycine

C. 2- hydroxymethyl serine

D. Tryptophan.

Answer: C



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25. Nitrobenzene gives N-phenylhydroxylamine by

A. Sn/HCl

B. $H_2/Pd-C$

C. Zn/NaOH

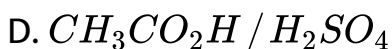
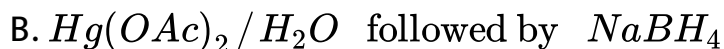
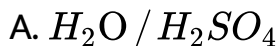
D. Zn/NH_4Cl

Answer: D



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26. Prop-1-ol can be prepared from propene



Answer: C



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27. Which of the following are arranged in the decreasing order of dipole moment ?

A. CH_3Cl , CH_3Br , CH_3F

B. CH_3Cl , CH_3F , CH_3Br

C. CH_3Br , CH_3Cl , CH_3F

D. CH_3Br , CH_3F , CH_3Cl

Answer: B



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28. What is the co-ordination number of sodium in Na_2O ?

A. 6

B. 4

C. 8

D. 2

Answer: B

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29. Which of the following compounds possesses the $C - H$ bonds with the lowest bond dissociation energy?

A. Toluene

B. Benzene

C. n-pentane

D. 2,2- dimethylpropane

Answer: A

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30. One gram sample of NH_4NO_3 is decomposed in a bomb calorimeter. The temperature of the calorimeter increases by $6.12K$. The heat capacity of the system is $1.23KJ/g/deg$. What is the molar heat of decomposition for NH_4NO_3 ?

- A. $-7.53kJ/mol$
- B. $-398.1kJ/mol$
- C. $-16.1kJ/mol$
- D. $-602kJ/mol$

Answer: D



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31. Which one of the following given below concerning properties of solutions, describe a colligative effect ?

A. Boiling point of pure water decreases by the addition of ethenol.

B. Vapour pressure of pure water decreases by the addition of nitric acid.

C. Vapour pressure of pure benzene decreases by the addition of naphthalene

D. Boiling point of pure benzene increases by the addition of toluene

Answer: D



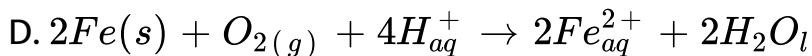
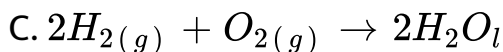
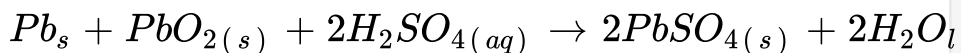
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32. Which of the following reaction is reaction is used to make a fuel cell .

A.



B.

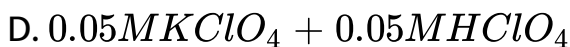
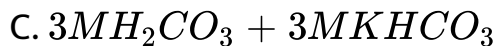
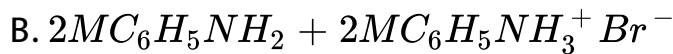
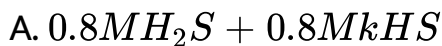


Answer: C



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33. Which one of the following is not a buffer solution ?

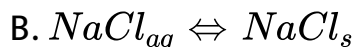
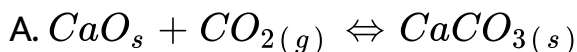


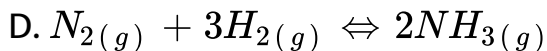
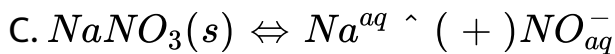
Answer: D



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34. Which of the following has ΔS° greater than zero





Answer: C

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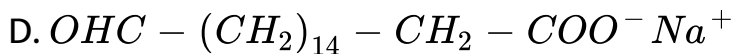
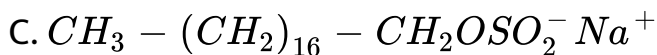
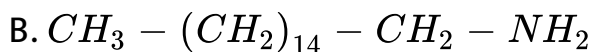
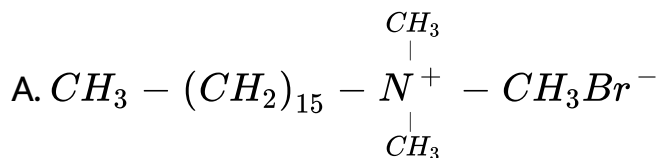
35. The quantum numbers 'm' of a free gaseous atom is associated with :

- A. The effective volume of the orbital
- B. The shape of the orbital
- C. The spatial orientation of the orbital
- D. The energy of the orbital in the absence of a magnetic field.

Answer: C

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36. Which one of the following is not a surfactant?



Answer: B

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37. Time required to deposit one milli"mole" of aluminium metal by the passage of 9.65 amp through aqueous solution of aluminium ion is:

A. 30s

B. 10s

C. 30,000 s

D. 10,000 s

Answer: B



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38. In which of the following acid-base titration, the pH is greater than 8 at the equivalence point ?

- A. Acetic acid versus ammonia
- B. Acetic acid versus sodium hydroxide
- C. Hydrochloric acid versus ammonia
- D. Hydrochloric acid versus sodium hydroxide

Answer: B

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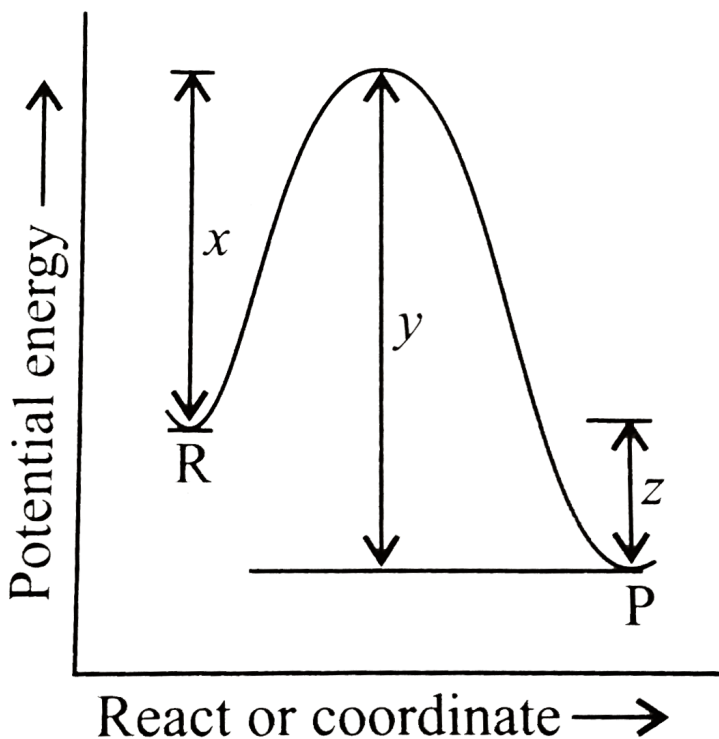
39. Which of the following is not a green house gas ?

- A. Carbon dioxide
- B. Water vapour
- C. Methane
- D. Oxygen

Answer: D

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40. The potential energy diagram for a reaction $R \rightarrow P$ is given below. ΔH^\ominus of the reaction corresponds to the energy



A. a

B. b

C. c

D. a+b

Answer: C



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41. Assertion : Solution of Na_2CrO_4 in water is intensely
electrons.

Reason : Oxidation state of Cr in Na_2CrO_4 is $+VI$.

A. If the both assertion and reason are true and the
reason is the correct explanation of the assertion

- B. If both assertion and reason are true and the reason is not the correct explanation of the assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false statements.

Answer: A



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42. The question consist of two statements each, printed as Assertion and Reason. While answering these questions you are required to choose any one of the following four responses:

Assertion: NF_3 is weaker ligand than $N(CH_3)_3$.

Reason: NF_3 ionizes to give F^- ions in aqueous solution.

- A. If the both assertion and reason are true and the reason is the correct explanation of the assertion
- B. If both assertion and reason are true and the reason is not the correct explanation of the assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false statements.

Answer: C



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43. Assertion : PbI_4 is a stable compound.

Reason : Iodide stabilizes higher oxidation state.

- A. If the both assertion and reason are true and the reason is the correct explanation of the assertion
- B. If both assertion and reason are true and the reason is not the correct explanation of the assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false statements.

Answer: D

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44. Assertion : $^{22}_{11}\text{Na}$ emits a positron giving $^{22}_{12}\text{Mg}$

Reason : In β^+ emission neutron is transformed into proton.

- A. If the both assertion and reason are true and the reason is the correct explanation of the assertion
- B. If both assertion and reason are true and the reason is not the correct explanation of the assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false statements.

Answer: D



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45. Assertion: Barium is not required for normal biological function in human.

Reason: Barium does not show variable oxidation state.

- A. If the both assertion and reason are true and the reason is the correct explanation of the assertion
- B. If both assertion and reason are true and the reason is not the correct explanation of the assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false statements.

Answer: A



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46. Assertion : Haemoglobin is an oxygen carrier.

Reason : Oxygen binds as O_2 to Fe of haemoglobin.

- A. If the both assertion and reason are true and the reason is the correct explanation of the assertion
- B. If both assertion and reason are true and the reason is not the correct explanation of the assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false statements.

Answer: C



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47. Assertion : Glycosides are hydrolysed in acidic conditions.

Reason : Glycosides are acetals

A. If the both assertion and reason are true and the reason is the correct explanation of the assertion

B. If both assertion and reason are true and the reason is not the correct explanation of the assertion

C. If assertion is true but reason is false

D. If both assertion and reason are false statements.

Answer: D



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48. Assertion: Benzyl bromide when kept in acetone water produces benzyl alcohol.

Reason: The reaction follows S_N2 mechanism.

- A. If the both assertion and reason are true and the reason is the correct explanation of the assertion
- B. If both assertion and reason are true and the reason is not the correct explanation of the assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false statements.

Answer: A



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49. Assertion(A): Activity of an enzyme is pH dependent.

Reason(R): Change in pH affects the solution of the enzyme in water.

A. If the both assertion and reason are true and the reason is the correct explanation of the assertion

B. If both assertion and reason are true and the reason is not the correct explanation of the assertion

C. If assertion is true but reason is false

D. If both assertion and reason are false statements.

Answer: B



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50. Assertion : Alkyl benzene is not prepared by Friedel Craft alkylation of benzene.

Reason : Grignard reagents react with hydroxyle group

- A. If the both assertion and reason are true and the reason is the correct explanation of the assertion
- B. If both assertion and reason are true and the reason is not the correct explanation of the assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false statements.

Answer: B



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51. Assertion: Hydroxyketones are not directly used in Grignard reaction.

Reason : Grignard reagents react with hydroxyl group.

- A. If the both assertion and reason are true and the reason is the correct explanation of the assertion
- B. If both assertion and reason are true and the reason is not the correct explanation of the assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false statements.

Answer: A



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52. Assertion : trans - 2 - Butene on reaction with Br_2 gives meso - 2, 3 - dibromobutane.

Reason : The reaction involves syn - addition of bromine.

- A. If the both assertion and reason are true and the reason is the correct explanation of the assertion
- B. If both assertion and reason are true and the reason is not the correct explanation of the assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false statements.

Answer: C



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53. Assertion : *Cis* – 1, 3 dihydroxy cyclohexane exists in chair conformation.

Reason : In the chair form, there will not be hydrogen bonding between the two hydroxyl groups.

A. If the both assertion and reason are true and the reason is the correct explanation of the assertion

B. If both assertion and reason are true and the reason is not the correct explanation of the assertion

C. If assertion is true but reason is false

D. If both assertion and reason are false statements.

Answer: D



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54. Assertion: The increase in internal energy (ΔE) for the vaporisation of 1 mole of water at 1 atm and $373K$ is zero.

Reason: For all isothermal processes $\Delta E = 0$.

- A. If the both assertion and reason are true and the reason is the correct explanation of the assertion
- B. If both assertion and reason are true and the reason is not the correct explanation of the assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false statements.

Answer: A



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55. Assertion (A): $BaCO_3$ is more soluble in HNO_3 than in water.

Reason (R): Carbonate is a weak base and reacts with H^{\oplus} ions to form strong acid causing barium salt to dissociate.

- A. If the both assertion and reason are true and the reason is the correct explanation of the assertion
- B. If both assertion and reason are true and the reason is not the correct explanation of the assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false statements.

Answer: A



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56. Assertion: ΔH and ΔE are almost the same for the reaction. $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$

Reason: All reactants and products are gases.

- A. If the both assertion and reason are true and the reason is the correct explanation of the assertion
- B. If both assertion and reason are true and the reason is not the correct explanation of the assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false statements.

Answer: B



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57. Assertion : Photochemical smog is produced by nitrogen oxides.

Reason : Vehicular pollution is a major source of nitrogen oxides.

- A. If the both assertion and reason are true and the reason is the correct explanation of the assertion
- B. If both assertion and reason are true and the reason is not the correct explanation of the assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false statements.

Answer: B



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58. Assertion (A): The increasing pressure on water decreases its freezing point.

Reason (R):The density of water is maximum at $273K$.

A. If the both assertion and reason are true and the reason is the correct explanation of the assertion

B. If both assertion and reason are true and the reason is not the correct explanation of the assertion

C. If assertion is true but reason is false

D. If both assertion and reason are false statements.

Answer: B



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59. Assertion(A): The micelle formed by sodiumm stearate in water has -COO groups at the surface.

Reason(R): Surface tension of water is reduced by addition of stearate.

A. If the both assertion and reason are true and the reason is the correct explanation of the assertion

B. If both assertion and reason are true and the reason is not the correct explanation of the assertion

C. If assertion is true but reason is false

D. If both assertion and reason are false statements.

Answer: B



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60. Assertion (A) The O-O bond length in H_2O_2 is shorter than that in O_2 .

Reason (R) H_2O_2 is ionic compound.

- A. If the both assertion and reason are true and the reason is the correct explanation of the assertion
- B. If both assertion and reason are true and the reason is not the correct explanation of the assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false statements.

Answer: D



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