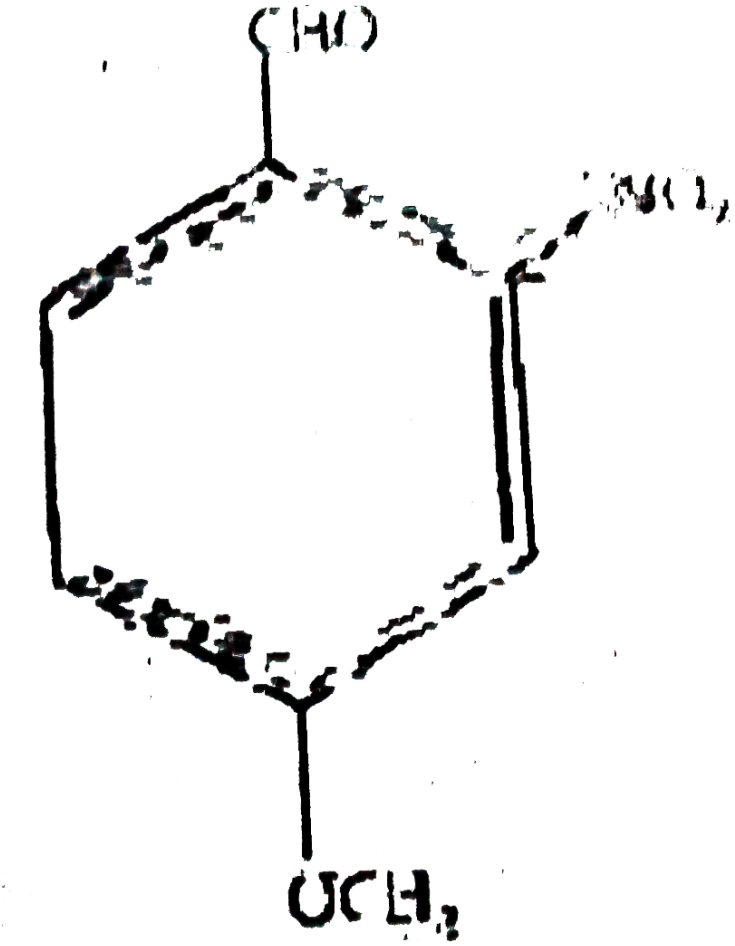
CHEMISTRY

BOOKS - AIIMS PREVIOUS YEAR PAPERS

AIIMS 2014

Chemistry

1. The IUPAC name of the compound



A. 4-methoxy-2-nitrobenzaldegyde

B. 4-fromyl-3-nitro anisole

C. 4-methoxy-6-nitro bezaldehyde

D. 2-formyl-5-methoxy nitrobenzene

Answer: A

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2. Butyne-1 on oxidation with hot alkaline $KMnO_4$ would give

A. CH_3CH_2COOH

B. CH_3CH_2COOH

C. $CH_3CH_2COOH + CO_2 + H_2O$

D. $CH_3CH_2COOH + HCOOH$

Answer: D

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3. Which one of the following statements is false

A. Photochemical smog causes irritation in eyes

B. London smoke is a mixture of smoke and fog

C. Photochemical smog results in the formation of PAN

D. London smog is oxidizing in nature

Answer: D

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4. Which of the following aqueous solution has the highest boiling point

A. $0.1MKNO_3$

B. $0.1MNa_3PO_4$

C. $0.1MBaCl_2$

D. $00.1MK_2SO_4$

Answer: B

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5. An increase in equivalent conductance of a strong electrolyte with dilution is mainly due to:

A. increase in number of ions

B. increase in ionic mobility of ions

C. increase in both i.e number of ions and ionic mobility of ions

D. at normal dilution 100% ionization of electrolyte

Answer: B

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6. The rate constant for a first order reaction becomes six times when the temperature is raised from 350 K to 400 K. Calculate the activation energy for the reaction

$[R = 8.314 JK^{-1} mol^{-1}]$

A. $4.17kJmol^{-1}$

B. $41.7kJmol^{-1}$

C. $417.0kJmol^{-1}$

D. $4170kJmol^{-1}$

Answer: B

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7. When dilute aqueous solution of $AgNO_3$ (excess) is added to KI solution, positively charged sol of Agl in formed due to adsorption of

A. NO_3^-

B. O_2^-

C. Ag^+

D. K^+

Answer: C

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8. In electrorefining of copper,some gold is deposited as

A. cathode

B. anode mud

C. cathode mud

D. electrode

Answer: B

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9. $CaCN_2 + C$ is called on

A. urea

B. thomas slag

C. nitrolim

D. triple super phosphate

Answer: C

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10. Which one of the following forms vortex ring

A. P_2O_5

B. PH_3

C. NH_3

D. P_4O_{10}

Answer: B

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11. What is X in the following reaction

$$KHSO_4 + F_2 \rightarrow HF + X$$

A. K_2SO_4

B. $K_2S_2O_4$

C. $K_2S_2O_3$

D. $K_2S_2O_3$

Answer: D

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12. Europium is

A. s-block element

B. p-block element

C. d-block element

D. f-block element

Answer: D

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13. The stability of ferric ion is due to

A. half-filled d-orbitals

B. half-filled f-orbitals

C. completely filled d-orbitals

D. completely filled f-orbitals

Answer: A

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14. An octahedral complex is formed when hybrid orbitals of the following type are involved

A. sp^3

B. dsp^2

C. d^2sp^3

D. sp^3d^2

Answer: C

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15. Which one amongst of the following isomerism is shown by $\left[Pt(NH_3)_2Cl_{20}\right]$?

A. Structrual

B. Geometrical

C. Optical

D. Conformational

Answer: B

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16. What is the structural formula of lithium tetrahydrido aluminate

A. $AI[LiH_4]$

B. $Al_2[LiH_4]_3$

C. $Li[AiH_4]$

D. $li[AiH_4]_2$

Answer: A

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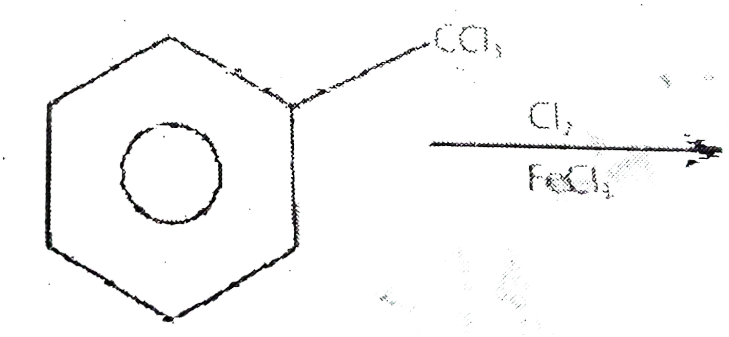
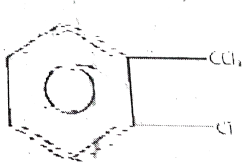
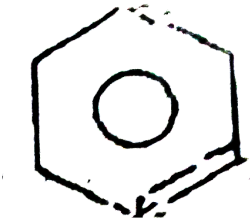
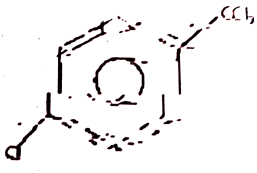
17. Find the major product in the following reaction



A. 

B. 

C. 

D. 

Answer: D

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18. An organic compound which produces a bluish green colored flame on heating in the presence of copper is

A. chlorobenzene

B. benazaldehyde

C. aniline

D. benzoic acid

Answer: A

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19. In Williamson's synthesis, ethoxy ethance is prepard by

A. heating sodium ethoxide with ethyl bromide

B. passing ethanol over heated alumina

C. treating ethyl alcohol with excess of cond. H_SO_4 at $430-440K$

D. heating ethanol wit dry AG_2O

Answer: A

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20. Which among the following compounds will give a secondary alcohol on reacting with Grignard reagent followed by acid hydrolysis ?

(i) HCHO (ii) C_2H_5CHO

(iii) CH_3COCH_3 (iv) $HCOOC_2H_5$

Select the correct anwer using the codes given below :

A. Only II

B. Only III

C. II and IV

D. III and IV

Answer: C

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21. Which of the following is the industrial method of preparation of acetaldegyde

A. $CH_3CN \xrightarrow[HCL]{Sncl_2} CH_3CH = NH \xrightarrow{H_2O^+} CH_3CHO$

B. $CH_3COCl + H_2 \xrightarrow[BaSO_4]{Pd} CH_3CO + HCL$

C. $CH_2 = CH_2 + H_2O \xrightarrow{Pd^{2+}} CH_3CHO$

D. All of the above

Answer: C

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22. C_3H_6O did not give a silver mirror with Tollen's reagent, but gave an oxime with hydroxylamine. It can gove positive

A. iodoform test

B. Fechling's test

C. Schiff's test

D. carbylamines test

Answer: A

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23. Which of the following carboxylic acids undergoes decarboxylation easily

A. $C_6H_5COCOOH$

B. $C_6H_5COCH_2COOH$

C. $C_6H_5CHOHCOOH$

D. $C_6H_5CH_2COOH$

Answer: B

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24. The stoichiometry of the following reaction is

$$K_2S_2O_8(aq) + 2kI(aq) \rightarrow 2K_2SO_4(aq) + I_2(aq)$$

A. $2:1$

B. $1:2$

C. $2:2$

D. $1:3$

Answer: B

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25. $\varphi^2 = 0$ represents

A. a node

B. an orbital

C. angular wave function

D. wave function

Answer: A

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26. If the de-Broglie wavelength of a particle of mass m is 100 times its velocity then its value in terms of its mass (m) and Planck's constant (h) is

A. $\frac{1}{10}\sqrt{\frac{m}{h}}$

B. $10\sqrt{\frac{h}{m}}$

C. $\frac{1}{10}\sqrt{\frac{h}{m}}$

D. $10\sqrt{\frac{m}{h}}$

Answer: B

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27. The pair having similar geometry is

A. PCl_3, NH_4^+0

B. $BeCl_2, H_2O$

C. $CH_4, \quad CCl_4$

D. IF_5, PH_5

Answer: C

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28. The correct order in which the O-O bond length increases in the following is

A. $H_2O < O_2 < O_3$

B. $O_3 < H_2O_2 < O_2$

C. $O_2 < O_3 < H_2O_2$

D. $O_2 < H_2O_2 < O_3$

Answer: C

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29. An $L.P.G$ cylinder contains $15kg$ of butane gas at $27^\circ C$ and 10 atm pressure It was leaking and its pressure fell down to 8 atm pressure after one day Calculate the amount of leaked gas .

A. 1 kg

B. 2 kg

C. 3 kg

D. 4 kg

Answer: C

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30. Assume each reaction is carried out in an open container. For which reaction will $\Delta H = \Delta E$?

A. $H_2(g) + Br_2(g) \rightarrow 2HBr(g)$

B. $C(s) + 2H_2O(g) \rightarrow 2H_2(g) + CO_2(g)$

C. $PCl_5(g) \rightarrow PCl_3(g) + Cl_2(g)$

D. $2CO(g) + O_2 \rightarrow 2CO(g)$

Answer: A

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31. In a basic buffer, 0.0025 mole of NH_4OH are present. The pH of the solution will be $(pK_a) = 4.74$

A. 11.04

B. 10.24

C. 6.62

D. 5.48

Answer: A

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32. Strongest conjugate base is

A. Cl^-

B. Br^-

C. F^-

D. I^-

Answer: C

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33. For the gas phase reaction,

$C_2H_4 + H_2 \Leftrightarrow C_2H_6(\Delta H = -32.7$ kcal) carried out in a vessel, the equilibrium concentration of C_2H_4 can be increased by

A. decreasing the pressure

B. increasing the temperature

C. removing some C_2H_6

D. adding some H_2

Answer: B

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34. Which one of the following is a conjugated protien

A. Phosphoprotein

B. Glycorprotein

C. Chromoprotein

D. All of these

Answer: D

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35. A solution containing 0.319 g of complex $CrCl_3.6H_2O$ was passed through cation exchanger and the solution given out was neutralised by 28.5 ml of 0.125 m NaOH. The correct formula of the complex will be: [molecular weight of complex =266.5]

A. $\left[Cr(H_2O)_6\right]Cl_3$

B. $\left[Cr(H_2O)_5Cl\right]H_2O.Cl_2$

C. $\left[Cr(H_2O)_4Cl_2\right]Cl \cdot H_2O$

D. $\left[Cr(H_2O)_3Cl_3\right]3H_2O$

Answer: A

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36. Which of the following is not an actinoid?

A. Curium (Z=96)

B. Californium (Z=98)

C. Uranium (Z=92)

D. Terbium (Z=65)

Answer: D

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37. The period number in the long form of the periodic table is equal to

A. magnetic quantam number of any element of the peroid

B. atomic number of any element of the period

C. maximum principal quantam number of any element of the period

D. maximum azimuthal quantam numbers of any element of the period

Answer: C

38. If the IP of Na is 5.48 eV, the ionsation potential of K will be

A. same as that of Na

B. 4.4 eV

C. 5.68 eV

D. 10.88 eV

Answer: B

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39. The entropy change involved in the isothermal reversible expansion of 2 moles of an ideal gas from a volume of $10dm^3$ to a volume of $100dm^3$ at $27^\circ C$ is

A. $42.3 Jmol^{-1}K^{-1}$

B. $38.3 Jmol^{-1}K^{-1}$

C. $35.8 Jmol^{-1}K^{-1}$

D. $32.3 Jmol^{-1}K^{-1}$

Answer: B

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40. Which of the following reagents may be used to distinguish between phenol and beznoic acid ?

A. Neutral $FeCl_3$

B. Aqueous NaOH

C. Tollen's reagent

D. Molisch reagent

Answer: A

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41. Assertion : Conformers are impractical to separate.

Reason : Conformers have negligibly small difference in their potential energy

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: A

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42. Assertion : ptoluidine is a stronger base than mtoluene.

Reason : Methyl group from mposition exerts smaller electron donating inductive (+I) effect than from pposition

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: C

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43. Assertion : 2-butyne on controlled hydrogenation with Pd/$CaCO_3$ in presence of PbO gives cis-2-butene.

Reason : Hydrogenation occur at the surfaces of metal containing adsorbed hydrogen

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: B

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44. Assertion : Treatment of chloroethane with a saturated solution of AgCN gives ethyl isocyanide as the major product.

Reason : Cyanide $\left(CN^{-}\right)$ is an ambident nucelophile

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: B

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45. Assertion : Reaction of alcohols with $SOCl_2$ is catalysed by the presence of a tertiary amine (R_3N).

Reason : Tertiary amine promote the reaction by reacting with the byproduct HCl.

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: A

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46. Assertion : Aldol condensation is usually carried out in dilute solution of a strong base.

Reason : Concentrated solution of strong base involved Cannizzaro reaction.

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: C

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47. Assertion : Malonic acid $(HOOC—CH_2—COOH)$ does not form cyclic anhydride on heating.

Reason : It is like βketo acid, on heating it prefer to decarboxylate.

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: A

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48. In each of the following two questions two statements are given one labelled as the Assertion(A) or Statement I and the other labelled as the reason (R) or statement II. Examine these statements carefully and mark the correct choice as per following instructions

Assertion (A) - Both 106 g of sodium carbonate and 12 g of graphite have same number of carbon atoms

Reason (R) - Both 106 g sodium carbonate and 12 g of graphite contain 1 g-atom of carbon

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: A

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49. The cation energy of an electron is largely determined by its principal quantum number.

The principal quantum number n is a measure of the most probable distance of finding atomic the electron around the nucleus.

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: A

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50. Assertion : When 1.0 mol of NaCl is doped with 10^{-3} mol $SrCl_2$, the number of cationic sites remaining vacant is 10^{-3}.

Reason : Each $SrCl_2$ unit produces tow cationic vacancy.

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: D

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51. Assertion : A process for which ΔS_{syst} as well as $\Delta H > 0$, passes from non spontaneous to spontaneous state as temperature is increased.

Reason : At higher temperature, $T\delta S$ exceeds ΔH

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: A

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52. Assertion (A) : A catalyst does not influences the values of equilibrium constant

Reason (R) : Catalyst influences the rate of both forward and backward reactions equally.

A. Both Assertion and Reason are true and Reason is the correct explanation of

Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: A

53. Assertion : Addition of a nonvolatile solute to a volatile solvent increases the boiling point.

Reason : Addition of nonvolatile solute results in lowering of vapour pressure.

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: A

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54. Assertion : Electrolysis of molten CaH_2 produces hydrogen gas at anode.

Reason : In CaH_2, hydrogen is present in the form of hydride H^-.

A. Both Assertion and Reason are true and Reason is the correct explanation of

Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: A

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55. Assertion : NaOH cannot be stored in a vessel made of aluminium or zinc.

Reason : A protective layer of oixde is formed on the surface of the metal

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: C

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56. Assertion: Boron always froms covalent bond.

Reason: The small size of B^{3+} favours formation of covalent bond.

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: A

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57. Assertion : CaF_2 has been given the same fluorspar.

Reason : Solid CaF_2 emits light when heated

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: A

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58. Assertion : The purple colour of $KMnO_4$ is due to the charge transfer transition.

Reason : The intense colour in most of the transition metal complexes is due to dd transition.

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of

Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: B

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59. Assertion : Al_2O_3 is converted to aluminium by reduction with carbon.

Reason : Carbon (graphite) has greater affinity for oxygen than Al.

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: D

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60. Assertion : $\left[Ni(Co)_4\right]$ is a diamagnetic complex.

Reason : All the electrons in the complex are paired

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of Assertion

C. Assertion is true but Reason is false

D. Both Assertion and Reason are false

Answer: A