CHEMISTRY

BOOKS - A2Z CHEMISTRY (HINGLISH)

THE D AND F BLOCK ELEMENTS

General Physical And Chemical Properties Of D Block Elements

1. The transition elements have a general electronic configuration:

A. $ns^2np^6nd^{1-10}$

B. $(n-1)d^{1-10}ns^{0-2}np^{0-6}$

C. $(n-1)d^{1-10}ns^{1-2}$

D. None of these

Answer: C

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2. What will be the charge on Fe^{x+} if the megnetic moment is $\sqrt{24}$?

A. $+2$

B. $+3$

C. Zero

D. None of these

Answer: A

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3. Which statement is true about the transitional elements?

A. They are highly reactive

B. They have low melting point

C. They show low melting point They show variable oxidation states

D. They are highly electropositive

Answer: C

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4. In which of the following paris both the ions are coloured in aqueous solution? (Atomic number, $Sc-21, Ti=22, Ni=28, Cu=29, Co=27$)

A. Ni^{2+} and Cu^{+}

B. Sc^{3+} and Ti^{3+}

C. Sc^{3+} and Co^{2+}

D. Ni^{2+} and Ti^{3+}

Answer: D

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5. In a reaction, the ferrous $\left(Fe^{++}\right)$ iron is oxidised to ferric $\left(FE^{++}\right)$ ion. The equivalent weight of the ion in the avbove reaction is equal to

A. The atlic weight

B. $1/5$ of the atomic weight

C. Half of the atomic weight

D. Twice the atomic weight

Answer: A

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6. Transition elements exhibit variable valencies because they release electrons from the following orbits :

A. ns orbit

B. ns and np orbits

C. $(n-1)d$ orbit

D. $(n-1)d$ and ns orbits

Answer: D

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7. One of the following metals froms a volatile corbony1 compound and this property is taken advantage of its extraction. This metal is

A. Iron

B. Cobalt

C. Nickel

D. Tungsten

Answer: C

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8. D bock elements are also knows as transition elements because their characters are

A. Like that of p-and-d-block elements

B. In between s and p-block elements

C. They are members of IA group

D. They are like inactive elements

Answer: B

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9. Which of the following has the maximum number of unpaired d-electron?

A. Zn^{2+}

B. Fe^{2+}

C. Ni^{2+}

D. Cu^{2+}

Answer: B

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10. A metal ion from the first transition series has a magnitic moment (calculated) or $3.87B.M.$ How man unparied electrons are expected to be present in the ion?

A. 1

B. 2

C. 3

D. 4

Answer: C

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11. $\left[Ti(H_2O)_6\right]^{3+}$ absorbs green and yellow region part of visible light. Then the transmitted colour of the compound is

A. blue

B. red

C. purple

D. green

Answer: C

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12. Which of the following ions are colourless?

A. V^{3+}

B. Mn^{2+}

C. Sc^{3-}

D. Ti^{3+}

Answer: C

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13. The catalytic activity of the transition metals and their compound is described to:

A. their chemical reactivity

B. their magnetic behaviour.

C. their filled d-orbitals

D. their abilitiy to adopt multiple oxidation state and their complexing ability.

Answer: D

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14. The atomic number of an element is 22. The highest oxidation state exhibited by it in its compound is ---------- ?

A. 1

B. 2

C. 3

D. 4

Answer: C

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15. In which of the following the stabiliy of two oxidation states is correctly represented?

A. $Fe^{2+} > Fe^{3+}$

B. $Ti^{3+} > Ti^{4+}$

C. $Mn^{2+} > Mn^{3+}$

D. $Cu^{+} > Cu^{2+}$

Answer: C

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16. Most powerful oxidizing property of manganese is shown by which of the following oxidation state

A. $Mn(+5)$

B. $Mn(+2)$

C. $Mn(+4)$

D. $Mn(+7)$

Answer: D

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17. The atomic radii of the elements are almost same of which series

A. $Li - Be - B$

B. $Na - K - Rb$

C. $F - C1 - Br$

D. $Fe - Co - Ni$

Answer: D

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18. Which of the following ions has the highest magnetic moment ?

A. Ti^{3+}

B. Mn^{3+}

C. Sc^{3+}

D. Zn^{2+}

Answer: C

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19. Of the following outer lectronic configurations fo atoms the highest oxdation state is achieved by wbhich one fo them :

A. $(n-1)d^5ns^2$

B. $(n-1)d^5ns^1$

C. $(n-1)d^8ns^2$

D. $(n-1)d^3ns^2$

Answer: A

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20. Which of the following represents the electronic configuration of a transition element?

A. $1s^2, 2s^2p^6 \ldots\ldots\ldots\ldots ns^2p^3$

B. $1s^2, 2s^2p^6 \ldots\ldots\ldots\ldots ns^2p^6$

C. $1s^2, 2s^2p^6 \ldots\ldots\ldots\ldots ns^2p^3d^{10}, (n+1)s^2p^1$

D. $1s^2, 2s^2p^6 \ldots\ldots\ldots\ldots ns^2p^3d^3, (n+1)s^2$

Answer: D

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21. Which of the following ions is not amphoteric?

A. $A1^{3+}$

B. Fe^{3+}

C. Cr^{3+}

D. Zn^{2+}

Answer: B

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22. Elements which generally exhibit multiple oxidation states and whose ions are usually coloured are

A. Metalloids

B. Non-metals

C. Transition elements

D. Gases

Answer: C

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23. Which in not true for transition elements?

A. They do not form coordinate compounds

B. They show variable valency

C. They form coloured ions

D. They are all metals

Answer: A

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24. Variable valency is shown by

A. Typical elements

B. Transition elements

C. Normal elements

D. None of these

Answer: B

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25. Which one of the following shows highest magnetic moments?

A. V^{3+}

B. Cr^{3+}

C. Fe^{3+}

D. Co^{3+}

Answer: C

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26. Which of the following oxides is basic?

A. Mn_2O_3

B. MnO

C. MnO_2

D. Mn_2O_7

Answer: B

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27. Tempered steel is

A. Soft and pliable

B. Hare and brittle

C. Very solft

D. Neither so hard nor so brittle

Answer: D

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28. Which of the following statement is not true?

A. Transtiton elements form the complex compounds

B. Coloured compounds of trasition element are paramagnetic

C. Colourless compounds of transition elements are diamagnetic

D. Colourless compounds of transition elements are paramagnetic

Answer: D

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29. Which one of the transittion metal ions is coloured in aqueous solution?

A. Cu^{+}

B. Zn^{2+}

C. Sc^{3+}

D. V^{4+}

Answer: D

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30. Which of the following species is expected ot show the highest magnetic moment? (At.Nos.: $Cr = 24, Mn = 25, Co = 27, Ni = 28, Cu = 29$)

A. Cr^{2+}

B. Cu^{2+}

C. Mn^{2+}

D. Co^{2+}

Answer: C

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31. Which of the following is the correct squence of atomic weights of given elements?

A. $Fe > Co > Ni$

B. $Co > Ni > Fe$

C. $Ni > Co > Fe$

D. $Fe > Ni > Co$

Answer: B

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32. Identify the transition element

A. $1s^2, 2s^2, 2p^6, 3s^6, 3p^6, 4s^2$

B. $1s^2, 2s^2, 2P^6, 3s^2, 3p^6, 4d^{10}, 4s^2 4p^2$

C. $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 4d^2, 4s^2$

D. $1s^2, 2s^2, 2p^6, 3s^2, 3P^6, 3p^6, 3d^{10}, 4s^2 4p^1$

Answer: C

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33. Which of the following ions is paramagnetic?

A. Sc^{++}

B. Cu^{++}

C. Zn^{++}

D. Ni^{++}

Answer: D

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34. The tendency of the transition elements to form coloured compounds is attributed to

A. transtiton of electrons from one atom to the ether.

B. transition of electrons from s-orbitals of the outer shells to p-orbitals.

C. d-d transition of electron in las but one shell.

D. none of the reason is correct.

Answer: C

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35. Cuprous ion is colourless, while cupric ion is colured because

A. Both have unparied electrons in d-orbital

B. Cuprous ions has imcomplete d-orbital and cupric ion has a completed d-orbital

C. Both have half-filled p and d-orbitals

D. Cuprous ion has a completed d-orbital and cupric ion has an incomplete d-orbital

Answer: D

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36. Platinum, palladium, iridium, etc., are called noble metals because

A. Alfred Noble discovered them

B. They are shining lustrous and pleasing to look at

C. They are inert towards many common reagents

D. They are found in active state

Answer: C

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37. The spin magnetic moment of cobalt in the compound $Hg[Co(SCN)_4]$ is

A. $\sqrt{3}$

B. $\sqrt{15}$

C. $\sqrt{8}$

D. $\sqrt{24}$

Answer: B

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38. The valence shell electronic configuration of Cr^{2+} ion is

A. $3p^2 4s^2$

B. $4s^2 3d^2$

C. $4s^2 3d^0$

D. $4s^0 3d^0$

Answer: D

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39. A transition element X has a configuration $[Ar]3d^4$ in its $+3$ oxidation state. Its atomic number is

A. 19

B. 26

C. 22

D. 25

Answer: D

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40. Of the ions Zn^2, Ni^{2+} and Cr^{3+} [atomic number of $Zn = 30, Ni = 28, Cr = 24$]

A. Only Ni^{2+} is coloured and Zn^{2+} and Cr^{3+} are colourless

B. All three are colourless

C. All three are coloured

D. Only Zn^{2+} is colourless and Ni^{2+} and Cr^{3+} are coloured

Answer: D

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41. Which of the following elements does not belong to the first transition series?

A. Fe

B. Ag

C. V

D. Cu

Answer: B

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42. The ability of d-block elements to form complexes is due to

A. small and highly charged ions

B. Vacant low energy orbital ot accept 1one pair of electrons from ligands

C. Both (a) and (b) are correct

D. None of the above

Answer: C

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43. The ions from among the following which are colourless are:

A. (i) and (ii) only

B. (i),(ii) and (iii)

C. (iii) and (iv)

D. (ii) and (iii)

Answer: A

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44. Which of the following transition metal ions has least magnetic moments?

(i) Ti^{4+} (ii) Cu^{+1}

(iii) Co^{3+} (iv) Fe^{2+}

A. Co^{3+}

B. Fe^{3+}

C. Cr^{2+}

D. V^{3+}

Answer: D

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45. Electronic configurations of $Cu(Z = 29)$ is

A. $[Ar]3d^9 4s^2$

B. $[Ar]3d^5 4s^2$

C. $[Ar]3d^{10} 4s^1$

D. $[Ar]3d^6 4s^2$

Answer: C

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46. The aqueous solution containing which one of the following ions will be colourless

(Atomic number $Sc = 21, Fe = 26, Ri = 22, Mn = 25$)

A. Mn^{2+}

B. Fe^{2+}

C. Ti^{3+}

D. Sc^{3+}

Answer: D

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47. Which of the following have maximum number of uparied electrons

A. Co^{3+}

B. Fe^{2+}

C. Co^{2+}

D. Fe^{3+}

Answer: D

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48. V_2O_5 is red or orange in colour. It is a/an....oxide

A. Acidic

B. Basic

C. Amphoteric

D. Neutral

Answer: A

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49. Which of the following shall have the highest value of magnetic moment?

A. $Zn(II)$ ion

B. $Mn(IV)$ ion

C. $Fe(II)$ ion

D. $Ti(III)$ ion

Answer: C

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50. The highest oxidation state is exhibited by the transition metals with configuration:

A. $(n-1)d^3ns^2$

B. $(n-1)d^5ns^1$

C. $(n-1)d^5ns^2$

D. $(n-1)d^8ns^2$

Answer: C

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51. Transition metals are related to which block

A. s-block

B. d-block

C. p-block

D. None of these

Answer: B

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52. Which of the following elements is not an actinide?

A. Terbium

B. Californium

C. Uranium

D. Cruium

Answer: A

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53. Which of the following general configuration of outermost shell represents chromium [Cr's atomic number = 24]?

A. d^3s^2

B. d^6s^0

C. d^4s^2

D. d^5s^1

Answer: D

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54. Among the following outermost configurations of transitionn metals, which shows the highest oxidation state

A. $3d^2 4s^2$

B. $3d^5 4s^2$

C. $3d^5 4s^1$

D. $3d^6 4s^2$

Answer: A

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55. Complex ion is shown by

A. Cu

B. Ag

C. Au

D. All of these

Answer: D

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56. Transition elements are frequently used as catalyst because:

A. or variable oxidationk state

B. of high ionic charge

C. large surface area of reactants

D. of their specific nature

Answer: A

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57. Among TiF_6^{2-}, CoF_6^{3-}, Cu_2Cl_2 and $NiCl_4^{2-}$ (At. No. $Ti = 22, Co = 27, Cu = 29, Ni = 28$), the colourless species are -

A. TiF_6^{2-} and Cu_2Cl_2

B. Cu_2Cl_2

C. TiF_6^{2-} and CoF_6^{3-}

D. CoF_6^{3-} and $NiCl_4^{2-}$

Answer: A

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58. Which of the following alloys contain only Cu and Zn?

A. Bronze

B. Gun metal

C. Brass

D. Bell metal

Answer: C

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59. The first ionisation energies of the elements of the transition series.

A. increases as the atomic number increase.

B. decrease as the atomic number increase.

C. do not show any change as the addition of electrons takes place in the inner $(n-1)$ d-orbitals.

D. increase from Ti to Mn and then decrease from Mn to Cu.

Answer: A

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60. Among the following series of transition metals ions, the one where all metal ions have $3d^2$ electronic configuration is:

A. $Ti^+, V^{2+}, Cr^{3+}, Mn^{4+}$

B. $Ti^+, V^{4+}, Cr^{6+}, Mn^{7+}$

C. $Ti^{2+}, V^{3+}, Cr^{2+}, Mn^{3+}$

D. $Ti^{2+}, V^{3+}, Cr^{4+}, Mn^{5+}$

Answer: D

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61. Generally transition metals act as catalyst because of

A. free valenies

B. large surface area

C. upaired d-electrons

D. All of these

Answer: D

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62. Europium is

A. s-block element

B. p-block element

C. f-block element

D. d-block element

Answer: C

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63. Which of the following is a colourless ion?

A. Zn^{+2}

B. Fe^{+3}

C. Ti^{+3}

D. Cu^{+2}

Answer: A

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64. On the basis of position in the electrolchemical series, the metal which does not displace H_2 from water and acid is :

A. Ba

B. Al

C. Pb

D. Hg

Answer: D

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65. Which has the maximum ferromagnetic character?

A. Ni

B. Co

C. Fe

D. Pb

Answer: C

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66. $3d^{10}4s^{0}$ electronic configuration exhibits

A. Hg^{++}

B. Cu^{++}

C. Cd^{++}

D. Zn^{++}

Answer: D

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67. Transition metal with low oxidation state will act as:

A. a base

B. an acid

C. both (a) and (b)

D. None of these

Answer: B

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68. The names transition and inner transition metals are used to indicate the element of:

A. d-block elements only

B. f-block elements only

C. p-and-d-blocks element respectively

D. d-and f-blocks elements respectively

Answer: D

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69. Which of the following will have standard oxidation potential less than SHE?

A. Zn

B. Fe

C. Cu

D. Ni

Answer: C

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70. Which one of the following is an example of non-typical transition elements?

A. Li, K, Na

B. Zn, Cd, Hg

C. $Be, A1, Pb$

D. Ba, Ca, Sr

Answer: B

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71. The metal ion which does not form coloured compound is

A. Chromium

B. Zine

C. Manganese

D. Iron

Answer: B

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72. Which metal does not give the following reaction

$M +$ water or steam $\rightarrow$ oxide $+ H \downarrow$

A. Magnesium

B. Iron

C. Sodium

D. Mercury

Answer: D

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73. The electronic configuration $1s^2, 2s^2, p^6, 3s^2, p^6, d^6$ corresponds to

A. Fe^{2+}

B. Mn^{2+}

C. Co^{2+}

D. Ge

Answer: A

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74. The correct statement(s) from among the following is/are:

(i) all the d and f-block elements are metals

(ii) all the d and f-block elements form coloured ions

(iii) all the d- and f-block elments form paramagnetic ions

A. (i) only

B. (i) and (ii)

C. (ii) and (iii)

D. All of these

Answer: A

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75. That the electronic configuration of ytterbium $(Z = 70)$ is $4f\&(14)5s^2$ and of lutetium $(Z) = 71)$ is $4f^{14}5d^16s^2$ can be explained on the basis of

A. the extra stability of the half-filled orbitals

B. the extra stability of the completely filled orbitals

C. the usual rules for the arrangement of electron in their orbits

D. None of these

Answer: C

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76. Which of the following ions gives coloured solution?

A. Fe^{++}

B. Zn^{++}

C. Ag^{++}

D. Cu^{++}

Answer: A

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77. The magnetic moment of metal ion of first transition series is $2.83BM$. Therefore, it will have unpaied electrons

A. 2

B. 4

C. 3

D. 6

Answer: A

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78. The oxidation number of iron in potassium ferrocyanide is

A. $+4$

B. $+3$

C. $+2$

D. Zero

Answer: C

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79. Mercury is transported in metal containers made of

A. Silver

B. Iron

C. Lead

D. Aluminium

Answer: B

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Kmno 4 And K 2 Cr 2 O 7

1. The number of mole of $KMnO_4$ that will be needed to react completely with one mole of ferrous oxalate in acidic solution is:

A. $3/5$

B. $2/5$

C. $4/5$

D. 1

Answer: A

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Kmno 4 And K 2 Cr 2 O 8

1. In following reaction

A. 2 and 16

B. 16 and 2

C. 8 and 16

D. 5 and 2

Answer: B

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Kmno 4 And K 2 Cr 2 O 9

1. The yellow colour of chromates changes to orange on acidification due to the formation of

A. Cr^{3+}

B. Cr_2O_3

C. $Cr_2O_7^{2-}$

D. CrO^{4-}

Answer: C

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Kmno 4 And K 2 Cr 2 O 10

1. Bullet-proof steel alloy is prepared by using

A. Sc

B. Ni

C. Zr

D. Zn

Answer: C

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Kmno 4 And K 2 Cr 2 O 11

1. $CuC1_2$ with $HC1$ in the pressence of oxidising agents gives

A. $CuC1_2$

B. H_2CuC1_2

C. Hydrogen gas

D. Chlorine gas

Answer: A

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Kmno 4 And K 2 Cr 2 O 12

1. $H_2Cr_2O_7$ on heating with aqueous $NaOH$ gives

A. Cr_4^{2-}

B. $Cr(OH)_3$

C. $Cr_2O_4^{2-}$

D. $Cr(OH)_2$

Answer: A

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Kmno 4 And K 2 Cr 2 O 13

1. $KMnO_4$ react with oxalic acid according to the equation,

$2MnO_4^- + 5C_2O_4^{2-} + 16H^+ \rightarrow 2Mn^{2+} + 10CO_2 + 8H_2O$

, here $20ml$ of $0.1MKMnO_4$ is equivalemt to

A. $20mlof0.5MC_2H_2O_4$

B. $50mlof0.1MC_2H_2O_4$

C. $20mlof0.5MC_2H_2O_4$

D. $20mlof0.1MC_2H_2O_4$

Answer: B

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Kmno 4 And K 2 Cr 2 O 14

1. If M is the molecular weight of $KMnO_4$, its equivalent weight will be when it is converted into K_2MnO_4

A. $M/7$

B. $M/3$

C. $M/5$

D. M

Answer: D

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Kmno 4 And K 2 Cr 2 O 15

1. To support tungsten filament in electric bulb, the steel used is

A. Cr

B. Ni

C. M

D. Mo

Answer: D

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Kmno 4 And K 2 Cr 2 O 16

1. MnO_4^- is intense pind colour, though Mn is in $(+7)$ oxidation state. It is due to

A. Oxygen gives colour to it

B. None of the above to it

C. charge transfer when Mn gives its electron to oxygen

D. Character transfer when oxygen gives its electron to Mn making it $Mn(+VI)$ and hence coloured

Answer: C

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Kmno 4 And K 2 Cr 2 O 17

1. Potassium permanganate acts as an oxidant in neutral, alkaline as well as acidic media. The final product obtained from it in three condition are respectively:

A. MnO_2, MnO_2, Mn^{2+}

B. $MnO_4^{2-}, Mn^{3+}, Mn^{2+}$

C. $Mn_2, MnO_4^{2-}, Mn^{3+}$

D. Mn, MnO_4, Mn^{3+}

Answer: A

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Kmno 4 And K 2 Cr 2 O 18

1. MnO_4^{2-} on reduction in acidic medium froms

A. MnO_4

B. Mn^{++}

C. MnO_4^{2-}

D. Mn

Answer: B

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Kmno 4 And K 2 Cr 2 O 19

1. Acidified solution of chromic acid on treatment with hydrogen peroxide yields

A. $CrO_3 + H_2O + O_2$

B. $CrO_5 + H_2O$

C. $Cr_2O_3 + H_2O + O_2$

D. $H_2Cr_2O7 + H_2O + O_2$

Answer: B

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Kmno 4 And K 2 Cr 2 O 20

1. Which of the statement is not correct?

A. Potassium permanganate is powerful oxidising substane

B. Potassium is a weaker oxidising substnace than potassium dichromate

C. Potassium permanganate is a stronger oxidising substance the potassium dichromate

D. Potassium dichromate oxidises a scondary alcohol into a kenton

Answer: B

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Kmno 4 And K 2 Cr 2 O 21

1. The formula of corrosive sublimate is

A. $HgC1_2$

B. $HgC1_2$

C. Hg_2O

D. Hg

Answer: A

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Kmno 4 And K 2 Cr 2 O 22

1. In acidic medium one mole of MnO_4^- accepts how many moles of electrons in a redox process?

A. 1

B. 3

C. 5

D. 6

Answer: C

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Kmno 4 And K 2 Cr 2 O 23

1. Manganese show oxidation state from $+2$ to $+7$. The most oxidizing state known in aqueous solution is

A. $+7$

B. $+4$

C. $+3$

D. $+2$

Answer: A

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Kmno 4 And K 2 Cr 2 O 24

1. In acidic medium potassium dichromate acts as on oxidant according to the equation,

$Cr_2O + 14H^+ + 6e^- \rightarrow 2Cr^{3+} + 7H_2O$. What is the equivalent weight of $K_2Cr_2O_7$? (mol. $Wt. = M$)

A. M

B. $M/2$

C. $M/3$

D. $M/6$

Answer: D

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Kmno 4 And K 2 Cr 2 O 25

1. Acidified potassium dichromate on reacting with a suplhite is reduced to

A. CrO_2C1_2

B. CrO_4^{2-}

C. Cr^{3+}

D. Cr^{2+}

Answer: C

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Kmno 4 And K 2 Cr 2 O 26

1. The product of oxidation of I^- ion by MnI_4^{2-} in alkaline medium is

A. I_2

B. IO_3^{1-}

C. IO_4^-

D. I_3^-

Answer: B

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Kmno 4 And K 2 Cr 2 O 27

1. An explosion takes place when conc. H_2SO_4 is added to $KMnO_4$. Which of the following is formed?

A. Mn_2O_7

B. MnO_2

C. $MnSO_4$

D. Mn_2O_3

Answer: A

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Kmno 4 And K 2 Cr 2 O 28

1. Railway wagon axles are made by heating rods of iron embedded in charcoal powerder. The process is known as

A. Case hardening

B. Sherardizing

C. Annelaing

D. Tempering

Answer: A

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Kmno 4 And K 2 Cr 2 O 29

1. The correct formula of permaganic acid is

A. $HMnO_4$

B. $HMnO_5$

C. H_2MnO_4

D. H_2MnO_3

Answer: A

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Kmno 4 And K 2 Cr 2 O 30

1. When $KMnO_4$ reacts with acidified $FeSO_4$

A. $FeSO_4$ is oxidised and $KMnO_4$ is reduced

B. Only $KMnO_4$ is oxidised

C. Only $FeSO_4$ is oxidised

D. None of these

Answer: A

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Kmno 4 And K 2 Cr 2 O 31

1. Acidified potassium permanganate soultion is decoloursied by

A. Bleaching powder

B. White vitriol

C. Mohr's slat

D. Microcosmic salt

Answer: C

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Kmno 4 And K 2 Cr 2 O 32

1. The solubility of silver bromide in hypo solution due to the formation of

A. $[Ag(S_2O_3)]^{-3}$

B. Ag_2SO_3

C. $[Ag(S_2O_3)]^{-}$

D. $Ag_2S_2O_3$

Answer: A

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Kmno 4 And K 2 Cr 2 O 33

1. Brass in an ally of

A. Zn and Sn

B. Zn and Cu

C. Cu, Zn and Sn

D. Cu and Sn

Answer: B

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Kmno 4 And K 2 Cr 2 O 34

1. Acidified potassium dichromate is treated with hydrogen sulphide. In the reactiion, the oxidation number of chromium

A. Increases from $+3$ to $+6$

B. decreases from $+6$ to $+3$

C. Remains unchanged

D. Decreases from $+6$ to $+2$

Answer: B

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Kmno 4 And K 2 Cr 2 O 35

1. In photography, sodium, thisulphate is used as

A. Complexing agent

B. Oxidising agent

C. Reducing agent

D. None of these

Answer: A

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Kmno 4 And K 2 Cr 2 O 36

1. Which of the following statement is about $Cr_2O_7^-$ sturcture?

A. It has neither $Cr - Cr$ bonds nor $O - O$ bonds

B. It has one $Cr - Cr$ bond and seven $Cr - O$ bonds

C. It has one $Cr - Cr$ bond and six $O - O$ bonds

D. It has no $Cr - Cr$ bonds and has six $O - O$ bonds

Answer: A

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Kmno 4 And K 2 Cr 2 O 37

1. When $KMnO_4$ reacts with acidified $FeSO_4$

A. Only $FeSO_4$ is oxidised

B. Only $KMnO_4$ is oxidised

C. $FeSO_4$ is oxidised $KMnO_4$ and is reduced

D. None of these

Answer: C

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Kmno 4 And K 2 Cr 2 O 38

1. When $(NH_4)_2Cr_2O_7$ is subjected to heat, compounds formed are

A. NH_3, Cr_2O_3

B. $H_2O, (NH_4)_2CrO_4$

C. N_2, Cr_2O_3

D. CrO_5

Answer: C

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Kmno 4 And K 2 Cr 2 O 39

1. $4K_2Cr_2O_7 \xrightarrow{heat} 4K_2CrO_4 + 3O_2 + X$. In the above reaction X is

A. CrO_3

B. Cr_2O_7

C. Cr_2O_3

D. CrO_5

Answer: C

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Kmno 4 And K 2 Cr 2 O 40

1. Which of the following statements is corrected about equivalent weight of $KMnO_4$?

A. It is one third of its molecular weightin alkaline

B. It is one fifth of its molecular weight in alkaline medium

C. It is equal to its molecular weight in acidic medium

D. It is one third of its molecular weight in acidic medium

Answer: A

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Kmno 4 And K 2 Cr 2 O 41

1. The number of moles of $K_2Cr_2O_7$ reduced by $1mol$ of Sn^{2+} ions is

A. $1/3$

B. 3

C. 1.6

D. 6

Answer: A

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Kmno 4 And K 2 Cr 2 O 42

1. Which one of the following is reduced by hydrogen peroxide in acid medium?

A. Potassium permanganate

B. Potassium iodide

C. Ferrous sulpate

D. Potassium ferrocyanide

Answer: A

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Kmno 4 And K 2 Cr 2 O 43

1. Which of the following oxides of manganes is amphoteric?

A. MnO_2

B. Mn_2O_3

C. Mn_2O_7

D. MnO

Answer: A

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Kmno 4 And K 2 Cr 2 O 44

1. Which one of the following oxides is ionic?

A. MnO

B. Mn_2O_7

C. CrO_3

D. P_2O_5

Answer: A

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Kmno 4 And K 2 Cr 2 O 45

1. Ammonium dichromate is used in some fireworks. The green-coloured powder blown in the air is

A. Cr

B. CrO_3

C. Cr_2O_3

D. $CrO(O_2)$

Answer: C

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Kmno 4 And K 2 Cr 2 O 46

1. $KMnO_4$ in basic medium is reduced to

A. K_2MnO

B. $Mn(OH)_2$

C. MnO_2

D. Mn^{2+}

Answer: C

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Kmno 4 And K 2 Cr 2 O 47

1. In alkaline medium , $KMnO_4$ reacts as follows

$$2KMnO_4 + 2KOH \rightarrow 2K_2MnO_4 + H_2O + O$$

Therefore, the equivalent mass of $KMnO_4$ will be

A. 31.5

B. 52.7

C. 72

D. 158

Answer: D

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Kmno 4 And K 2 Cr 2 O 48

1. The colour of $K_2Cr_2O_7$ changes from red-orange to lemon-yellow on treatment with $KOH_{(aq.)}$, because of:

A. The reduction of Cr^{VI} to Cr^{III}

B. The formation of chromium hydroxided

C. The conversion of dichromate to chromate

D. The oxidation of potassium hydroxide to potassium peroxide

Answer: C

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Kmno 4 And K 2 Cr 2 O 49

1. Oh heating pyrolusite with KOH in presence of air we get

A. $KMnO_4$

B. K_2MnO_4

C. $Mn(OH)_2$

D. Mn_3O_4

Answer: B

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Kmno 4 And K 2 Cr 2 O 50

1. Equivalent weight of $KMnO_4$ acting as an oxidant in acidic medium is

A. Molecular weight of $KMnO_4$

B. $\frac{1}{2} \times$ Molecular weight of $KMnO_4$

C. $\frac{1}{3} \times$ Molecular weight of $KMnO_4$

D. $\frac{1}{5} \times$ Molecular weight of $KNnO_4$

Answer: D

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Kmno 4 And K 2 Cr 2 O 51

1. Manganese achieves its hightest oxidation state in its compound

A. MnO_3

B. Mn_3O_4

C. $KMnO_4$

D. K_2MNO_4

Answer: C

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Kmno 4 And K 2 Cr 2 O 52

1. In which of the following ionic radii of chromium would

A. K_2CrO_4

B. CrO_2

C. $CrC1_2$

D. CrF_2

Answer: A

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Kmno 4 And K 2 Cr 2 O 53

1. Acidified $KMnO_4$ is decolourized by

A. Br_2

B. O_3

C. $HC1$

D. Br

Answer: A

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Kmno 4 And K 2 Cr 2 O 54

1. In the reaction,

$KNmO_4 + 16HC1 \rightarrow 5C1_2 + 2KC1 + 8H_2O$ the reduction product is

A. $C1_2$

B. $MnC1_2$

C. H_2O

D. $KC1$

Answer: B

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Kmno 4 And K 2 Cr 2 O 55

1. $AgNO_3$ gives red ppt. with.

A. K_2CrO_4

B. $NaBr$

C. $NaNO_3$

D. K

Answer: A

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Lanthanides And Actinides

1. The f-block elements of the periodic table contains those element in which

A. Only $4f$ orbitals are progressively filled in 6th period.

B. only $5f$ orbtials are progressively filled in 7th period.

C. $4f$ and $5f$ orbitals are progressively filled in 6th and 7th periods respectively.

D. None of these

Answer: C

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2. Set of continuos atomic number of elements are present in the same group as well as same period.

A. 89,90,91,92

B. 56,57,58,59

C. 68,69,70,71

D. 101, 102, 103, 104

Answer: C

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3. Across the lanthanide series, the basicity of the lanthanoid hydroxides:

A. increase

B. Decreases

C. first increases and then decreases

D. does not change

Answer: B

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4. The radius of La^+ (at no 57) is 1.06Å. What may be the radius of Lu^{3+} (at no.71)?

A. 1.6Å

B. 0.85Å

C. 1.06Å

D. 1.4Å

Answer: B

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5. Misch metal is

A. am alloy o flanthanide and copper

B. an alloy of lanthanide and nickel

C. an alloy of lanthanide iron carbon

D. an alloy of calcium and copper

Answer: C

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6. $+4$ ion of which has half-filled $4f$ subshell?

A. Nd

B. Tb

C. Sc

D. Tu

Answer: B

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7. The main reason for larger number of oxidation state exhibited by the actinides than the corresponding lanthanides, is

A. lesser energy difference between $5f$ and $6d$ orbitals than between $4f$ and $5d$-orbitals

B. larger atomic size of actinides than the lanthanides

C. more energy difference between $5f$ and $6d$ orbitals than between $4f$ and $5d$-orbitals

D. greater reactive nature of the actinides than the lanthanides

Answer: A

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8. An alloy of lanthanides

A. type metal

B. nichrome

C. wood metal

D. misch metal

Answer: D

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9. The lanthanide contraction is responsible for the fact that

A. Zr and Y have about the same radius

B. Zr and N/b have similar oxidation state

C. Zr and Hf have about the same radius

D. Zr and Ce ahave same oxidation state

Answer: C

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10. Across the lanthanide series, the basicity of the lanthanoid hydroxides:

A. first decreases and then increases

B. decreases

C. increases

D. first increase and then decreases

Answer: B

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11. Lanthanides and actinides resemble in

A. electronic configuration

B. oxidation state

C. ionization energy

D. fromation of complexes

Answer: A

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12. Lanthanides contraction cause.

A. small decrease in stantard electrode potential value of lanthanides

B. small decrease in basic strength of oxide of lanthanides

C. samll variation in chemical properites of lanthanides

D. samll increase in electronegativities of lanthanides

Answer: D

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13. The speration of lanthanides by ion exchanges method is based on

A. sizes of the ions

B. oxidation state of the ions

C. the solubility of their nitrates

D. basicity of hydroxides of landthanides

Answer: A

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14. The radiocative lanthanide is

A. ytterbium (Yb)

B. iron (Fe)

C. promethium (Pm)

D. copper (Cu)

Answer: C

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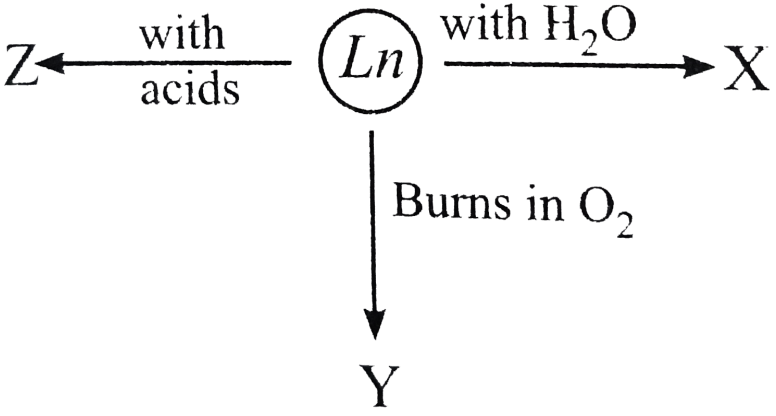
15. Complete the following reaction



A. $\ln_2 O_3, H_2, \ln(OH)_3 + H_2$

B. $\ln O_3 + H_2, \ln_2 O_3, H_2$

C. $H_2, \ln_2 O_3, \ln(OH)_3 + H_2$

D. $\ln(OH)_3 + H_2, \ln O_2, H_2$

Answer: B

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16. The pair of lanthanides with the highest third ionization energy is

A. Lu and Yb

B. Eu and Gd

C. Eu and Yb

D. Dy and Yb

Answer: C

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17. All actinods have high desities except

A. Th and Pa

B. Am and Cm

C. Th and Am

D. Pa and Cm

Answer: C

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18. Which one of the following is an electronic configuration of thorium?

A. $[Rn]5f^26d^07s^2$

B. $[Rn]5f^16d^17s^2$

C. $[Rn]5f^06d^27s^2$

D. $[Rn]5f^26d^27s^2$

Answer: C

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19. Consider the following statement,

(I) The size of the lanthanide M^{3+} ions decreases s the atomic number o Mincreases.

(II) Electoronic spectra of lanthanide show very broad bands.

(III) As wihth transition metal, coordination number 6 is very common in lanthanide complexes.

A. I only

B. I and II

C. I and III

D. III only

Answer: B

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20. The actinoids exhibit, more member of oxidation states in general than the lanthanoids. This is because

A. the actinides are more reactive than the lanthanides

B. the $5f$-orbits are more buried than the $4f$-orbits

C. there is a similarity between $4f$and $5f$-orbits in their angular part of the wave function.

D. the $5f$-orbits extend farther from the nucleus than the $4f$-orbitals.

Answer: D

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21. Which of the following factor may be regarded as the main cause of lanthanide contraction?

A. Poor shielding of $4f$-electrons in compare to other electrons in the sub-shell

B. Effective shielding of one of the $4f$-electrons by another in the sub-shell

C. Poorer shielding of $5d$ electron by $4f$-electrons.

D. Greater shielding of $5d$ electrons by `5f-electron.

Answer: A

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22. In which $5f$ subshell is half-filled?

A. Am and Cm

B. Cm and Bk

C. Cm and No

D. No and Am

Answer: A

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23. The actinides showing $+7$ oxidation state are:

A. U, Np

B. Pu, Am

C. Np, Pu

D. Am, Cm

Answer: C

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24. Which of the following is not an actinide?

A. Californium

B. Uranium

C. Curium

D. Rutherfordium

Answer: D

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25. Which of the following statements is not correct?

A. $La(OH)_3$ is less basic than $Lu(OH)_3$

B. In lanthanide series, ionic radius of $\ln^{3+}$ ions decreases

C. La is actually an elements of transition series rather than lanthanide series

D. Atomic radii of Zr and Hf are same because of lanthanide contraction

Answer: A

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26. Which of the following elements shows maximum number of different oxidation states in its compounds ?

A. Gd

B. Eu

C. Am

D. La

Answer: C

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27. Gadolinium (Gd) has $4f^7 5d^1 6s^2$ electronic configuration outside the [Xe] core. Find spin magnetic moment of Gd^{3+}

A. $\sqrt{63}B.\ M$

B. $\sqrt{35}B.\ M$

C. $\sqrt{48}B.\ M$

D. $\sqrt{24}B.\ M$

Answer: A

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28. Which of the following elements is not an actinide?

A. Curium

B. Californium

C. Uranium

D. Terbium

Answer: D

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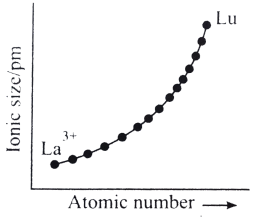
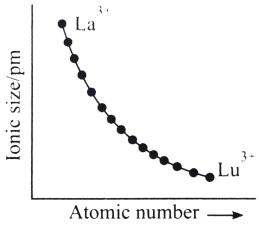
29. Which of the following graphs shown correct trends in the size of $+3$ ions of lanthanides?

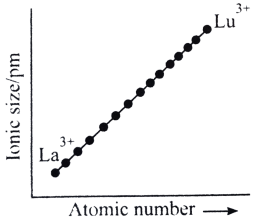
A.



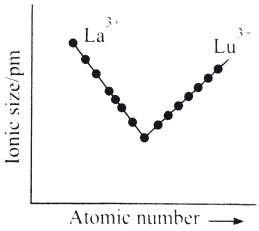
B.



C.



D.



Answer: B

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Section B Assertion Reasoning

1. Assertion: Transitio metals show variable valence.

Reason : Due to a large energy difference bteween the ns^2 and $(n-1)d$ electrons.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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2. Assertion : Copper metal is turned green when exposed to atmospheric CO_2 and moisture.

Reason: Copper gets covered with a green layer of basic copper carbonate.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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3. Assertion : Ammoniacal silver nitrate converts glucose to gluconic acid and metallic is precipitated.

Reason : Glucose acts as a week reducing is precipitated.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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4. Assertion : The aqueous solution of $FeCl_3$ is basic in nature .

Reason : $FeC1_3$ hydrolyses in water.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

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5. Assertion : $AgC1$ dissolves in NH_4OH solution.

Reason: Due to formation of a complex.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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6. Assertion : The lowest oxide of a transition metal (say, chromium, atomic number 24) is basic whereas the highest oxide is usually acidic.

Reason: Cr_2O_3 is amphoteric in nature.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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7. Assertion : In acid solution, permanganate is reduced to Mn^{2+} by an excess of reducing agent.

Reason : MnO_4^- reduced in Mn^{2+} in acidic medium and the product in the presence of an excess of permanganate is MnO_2.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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8. Assertion : Pure iron is not used for making tools and machines.

Reason : Pure iron is hard.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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

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

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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10. Assertion : The free gases Cr atom has six unpaired electrons.

Half-filled $'s'$ orbital has greater stability.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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11. Assertion: Tt^{3+} salts are coloured whereas Ti^{4+} salts are white. Ti^{3+} is less stable than Ti^{4+}

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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12. Assertion: The metals of 4d and 5d greater enthalpies of atomisation than the corresponding elements of the 3d series.

Reason: The metal-metal bond in 4d and 5d series are stronger than those in the 3d series.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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13. Assertion : Potassium dichromates gives deep red vapours with concentrated H_2SO_4 and sodium chloride.

Reason : The reaction of sodium chloride with solid $K_2Cr_2O_7$ and concentrated H_2SO_4 produces chromyl cholride.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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14. Assertion : Manganese show a maximum oxidation state of $+5$.

Reason : Manganese has 5 electrons in the $3d$ subshell.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

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15. Assertion: MnO is basic whereas Mn_2O_7 is acidic.

Reason: Higher the oxidation state of a transition metal in its oxide, greater is the acidic character.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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16. Assetion : Ce^{3+} is used as an oxidizing in volumetric analysis.

Reason : The nubmer of uparied electrons in the following gaseous inon:

Mn^{3+}, Cr^{3+}, V^{3+} and Ti^{3+} are 4,3,2 and 1 respctively.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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17. Assertion : The number of unpaired electrons in the following gaseous ions:

Mn^{3+}, Cr^{3+}, V^{3+} and Ti^{3+} are 4,3,3 and 1 respcetively.

Reason : Cr^{3+} is most stable in aqueous solution amongst these ions

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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18. Assertion : Lanthanoids show a limited of ixidation states wheres actanoids show a large number of oxidation states.

Reason : Energy gap between $4f, 5d$ and $6s$ subshells is small wheras that between $5f, 6d$ and $7s$ subshell is large.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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19. Assertion : The highest manganese fluroide is MnF_4 and the highest oxide is Mn_2O_7.

Reason : In Mn_2O_7, each Mn is tetrahedrally surrounded by $O's$ including $Mn - O - Mn$ bridge.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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20. Assertion: Mercury is not considered as a transition element.

Reason: Mercury is liquid.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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21. Assertion: In any transition series the magnetic moment of M^{2+} ions first decreases

Reason: In a transition series, the number of unpaired electrons first increases and then decreases.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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22. Assertion : Silver intrate is reduced to silver by the hydrides of 15th group element (except NH_3) because

Reason : They act as strong reducing agents.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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23. Assertion : $Ag_2S + 4KCN\ 2K\left[Ag(CN)_2\right] + K_2s$

Reason : The reaction is carried to K_2SO_4 thereby shifting the equilibrium in forward direction.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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24. Assertion: $K_2Cr_2O_7$ is used as primary standard in volumetric analysis.

Reason: It has a good solubility in water.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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25. Assertion : The value of enthaply of atomisation is maximum at about the middle of each series.

Reason : There is one uparied electron per d-orbital and this results in stronger interatomic interaction.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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26. Assertion: The spin only magnetic moment of Sc^{3+} is 1.73 BM.

Reason: The spin only magnetic momentum in (BM) is equal to $\sqrt{n(n+2)}$.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

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27. Assertion : Hydrochloric acid is not used to acidify a $KMnO_4$ solution in volumetric analysis of Fe^{2+} and $C_2O_4^{2-}$ because.

Reason : Part of the oxygen produced from $KMnO_4$ and HCl is used up in oxidising HCl to Cl_2.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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

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

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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29. Assertion : Reaction of thionyl chloride with hydrated ferric chloride yields anhydrous ferric chloride.

Reason : Water of crystallisation present with ferric

chloride reacts with thionyl chloride to liberate HCl and SO_2 gases.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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30. Assertion : Hyydroquinone is used as a developer for developing black and white photographic film.

Reason : Hydroquinone reduces silver bromide to black silver particles and an inverted images of the object is produced on a cellulod film.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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31. Assertion : The order of atomic radii of Cu, Ag and Au is $Cu < Ag \approx Au$.

Reason : The atomic radii of $4d$ series elements are larger than those of $3d$ series elements but generally the radii of $4d$ and $5d$ series elements are almost identical.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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32. Assertion : $4d$ and $5d$ series elements have nearly same atomic radius.

Reason : Lanthanoid contraction.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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33. Assertion: Tungsten has very high melting point.

Reason: Tungsten is a covalent compound.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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34. Assertion: Mn atom loses ns electrons first during ionisation as compared to $(n-1)$ d electrons

Reason: The effective nuclear charge experienced by $(n-1)$d electrons is greater than that by ns electrons.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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35. Assertion : $CuSO_4.5H_2O$ on heating to $250^\circ C$ losses all the five H_2O molecules and becomes anhydrous.

Reason : All five H_2O molecules are coordinated to the central Cu^{2+} ion.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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36. Assertion : Silver chloride dissolves in execss ammonia.

Reason : $AgCl$ forms a soluble complex, $\left[Ag(NH_3)_2\right]Cl$ with ammonia.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

37. Assertion : CrO_3 is an acid anhydride.

Reason: CrO_3 is obtained as bright orange crystals by the reaction of $K_2Cr_2O_7$ with cold concentrated H_2SO_4.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

38. Assertion : Solid potassium dichromate gives greenish yellow vapour with concentrated H_2SO_4 and solid ammonium chloride.

Reason : The reaction of ammonium chloride with solide $K_2Cr_2O_7$ and concentrated H_2XO_4 produces chromyl chloride.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

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39. Assetion : Permanganate titrations is not carried out in presence of hydrochloric acid.

Reason : Hydrochloric acid is oxidised to chlorine.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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40. The free gaseous Cr atom has six unpaired electrons.

Half-filled s-orbital has greater stability.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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41. Assertion : K_2CrO_4 has yellow colour due to charge transfer.

Reason : CrO_4^{2-} ion is tetrahedral in shape.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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42. Assetion : The green manganate is paramagnetic but the pruple permanganate is diamagnetic in nature.

Reason : MnO_4^{2-} contains on upaired electron while in MnO_4^- all electrons are paried.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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Aipmt Neet Questions

1. Copper sulphate solution reacts with KCN to give

(a) $Cu(CN)_2$

(b) $CuCN$

(c) $K_2\left[Cu(CN)_4\right]$

(d) $K_3\left[Cu(CN)_4\right]$.

A. $Cu(CN)_2$

B. $CuCN$

C. $K_2[CuCN)_4]$

D. $K_3\left[Cu(CN)_4\right]$

Answer: D

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2. Zn gives H_2 gas with H_2SO_4 and HCl but not with HNO_3 because

A. NO_2 is reduced in preference to H_3O^-

B. HNO_3 is weaker acid than H_2SO_4 and HCl

C. Zn acts oxidising agent when reacts with HNO_3

D. In electrochemical series Zn is placed above the hydrogen

Answer: B

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3. The temperature of blast furnace to produce iron from its ore Fe_2O_3 varies from $500^\circ C$ at the top of the furance to about $1900^\circ C$ at the bottom of the furance. The reaction between the ore Fe_2O_3 and CO at the lowest temperature $(\sim 500^\circ C)$ is

A. $3Fe_2O_3 + CO \rightarrow 2Fe_3O_4 + CO_2$

B. $Fe_2O_3 + CO \rightarrow 2FeO + CO_2$

C. $Fe_2O_3 + 3C) \rightarrow 2Fe + 3CO_2$

D. $Fe_2O_3 + CO \rightarrow 2Fe + CO_2 + \frac{1}{2}O_2$

Answer: C

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4. The correct order of ionic radii Y^{3+} , La^{3+} , Eu^{3+} and Lu^{3+} is $(AT.\ No: Y = 39, La = 57, Eu = 63, Lu = 71)$

A. $Y^{3+} < La^{3+} < Eu^{3+} < Lu^{3+}$

B. $Y^{3+} < Lu^{3+} < Eu^{3+} < La^{3+}$

C. $Lu^{3+} < Eu^{3+} < La^{3+} < Y^{3+}$

D. $La^{3+} < Eu^{3+} < Lu^{3+} < Y^{3+}$

Answer: B

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5. Among the following series of transition metal ions the one where all meal ions have $3d^2$ electronic configuration is

A. $Ti^{3+}, V^{2+}, Cr^{3+}, Mn^{4+}$

B. $Ti^{+}, V^{4+}, Cr^{6+}, Mn^{7+}$

C. $Ti^{4+}, V^{3+}, Cr^{2+}, Mn^{3+}$

D. $Ti^{2+}, V^{3+}, Cr^{4+}, Mn^{5+}$

Answer: D

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6. Four successive members of the first row transition elements are listed below with their atomic number. Which one of them is expected to have the highest third ionisation enthalpy ?

A. Vanadium $(Z = 23)$

B. Chromium $(Z = 24)$

C. Manganese $(Z = 25)$

D. Iron $(Z = 26)$

Answer: C

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7. The aqueous solution containing which one of the following ions will be colourless

(Atomic number $Sc = 21, Fe = 26, Ri = 22, Mn = 25$)

A. Ti^{3+}

B. Mn^{2+}

C. Sc^{3+}

D. Fe^{2+}

Answer: C

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8. The main reason for larger number of oxidation state exhibited by the actinides than the corresponding lanthanides, is

A. more energy difference between $5f$ and 6 d-orbitals than between $4f$ and $5d$-orbitals

B. lesser energy difference between $5f$ and $6d$-robitals than between $4f$ and $5d$-orbitals

C. larger atmoic size of actinides than the lanthanides

D. greater reactive nature of the actinides than the lanthanides

Answer: B

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9. Which of the following pairs is coloured in aqueous solution?

A. Sc^{3+}, Co^{2+}

B. Ni^{2+}, Cu^{+}

C. Ni^{2+}, Ti^{3+}

D. Sc^{3+}, Ti^{3+}

Answer: C

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10. Which one of the elements with the following outer orbital configuration may exhibit the larger number of oxidation states ?

A. $3d^2, 4s^2$

B. $3d^3, 4s^2$

C. $3d^5, 4s^1$

D. $3d^5, 4s^2$

Answer: D

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11. which of the following electronts is present as the impurity to the maximum extent in the pig iron?

A. Phosphorus

B. Manganese

C. Carban

D. Silicon

Answer: C

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12. For the four successive transition elements (Cr, Mn, Fe, and Co), the stability of $+2$ oxidation state will be there in which of the following order ?

$(At.\ Nos.\ Cr = 24, Mn = 25, Fe = 26, Co = 27)$

A. $Cr > Mn > Co > Fe$

B. $Mn > Fe > Cr > Co$

C. $Fe > Mn > Co > Cr$

D. $Co > Mn > Fe > Cr$

Answer: B

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13. Identify the alloy containing a non metal as a constitunt in it

A. Bell metal

B. Bronze

C. Invar

D. Steel

Answer: D

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14. Red precipitae is obtained when ethanol solution of dimethylglyoxime is added to ammoniacal $Ni(II)$. Which

of the following statement is not true?

A. Red complex has a tetrahedral geometry

B. Complex has symmetrical H-bonding

C. Red complex has a square planner geometry

D. Dimethylglyoxime functions as bidenate ligand

Answer: A

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15. Four successive members of the first series of transition metals are listed below. For which one of the of standard potential $\left(E^{\circ}_{M^{2+}/M}\right)$ value has a positive sign ?

A. $Co = (Z = 27)$

B. $Ni(Z = 28)$

C. $Cu(Z = 29)$

D. $Fe(Z = 26)$

Answer: C

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16. $KMnO_4$ can be prepared fromK_2MnO_4 as per the reaction: 

The reaction can go the completion by removing $OH^{\ominus}$ ions by adding.

A. KOH

B. CO_2

C. SO_2

D. HCl

Answer: B

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17. Which of the following statements about the interstitial compounds is incorrect?

A. They retain metallic conductivity

B. They are much harder than the pure metal

C. They have higher melting points than the pure metal

D. They are chemcially recative

Answer: D

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18. The pair of compounds that can exist together is:

A. $FeCl_3, SnCl_2$

B. $HgCl_2, SnCl_2$

C. $FeCl_2, SnCl_2$

D. $FeCl_3, KI$

Answer: C

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19. Magnetic moment $2.83BM$ is shown by which of the following ions?

A. Ti^{3+}

B. Ni^{2+}

C. Cr^{3+}

D. Mn^{2+}

Answer: B

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20. Reason of lanthanide contraction is

A. negligble sereening effect of f-orbital

B. increasing unuclear charge

C. decreasing nuclear charge

D. decreasing screening effect

Answer: A

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21. Because of lanthnoid contraction, which of the following pairs of elements have nearly same atomic radii ? (Number in the parenthesis are atomic numbers)

A. $Zr(40)$ and $Hf(72)$

B. $Zr(40)$ and $Ta(73)$

C. $Ti(22)$ and $Zr(40)$

D. $Zr(40)$ and $Nb(41)$

Answer: A

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22. Gadolinium belongsd to 4f series. It's atomic number is 64. which of the following is the correct electronic configuration of gadolinium ?

A. $[Xe]4f^7 5d^1 6s^2$

B. $[Xe]4f^6 5d^2 6s^2$

C. $[Xe]4f^8 5d^2$

D. $[Xe]4f^8 6s^1$

Answer: A

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23. Assuming complete ionization, same moles of which of the following compounds will require the least amount of acidified $KMnO_4$ for complete oxidation ?

A. FeC_2O_4

B. $Fe(NO_2)_2$

C. $FeSO_4$ is oxidised $KMnO_4$ and is reduced

D. $FeSO_3$

Answer: C

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24. Which is the correct order of increasing energy of the listed orbitals in the atom of titanium ? (At. No. Z = 22)

A. $3s3p3d4s$

B. $3s3p4s3d$

C. $3s4s3p3d$

D. $4s3s3p3d$

Answer: B

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25. Which one of the following statement is correct when SO_2 is passed through acidified $K_2Cr_2O_7$ solution?

A. Green $Cr_2(SO_4)_3$ is formed.

B. The solution turns blue.

C. The solution is decolourized.

D. SO_2 is reduced

Answer: A

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26. The electronic configuration of Eu (Atomic No. 63), Gd (Atomic No. 64) and Tb (Atomic No. 65) are:

A. $[Xe]4f^7 6s^2$, $[Xe]4f^7 5d^1 6s^2$ and $[Xe]f^9 6s^2$

B. $[Xe]4f^7 6s^2$, $[Xe]4f^8 6s^2$ and $[Xe]4f^8 5d^1 6s^2$

C. $[Xe]4f^6 5d^1 6s^2$, $[Xe]4f^8 6s^2$ and $[Xe]4f^8 5d^1 6s^2$

D. $[Xe]4f^8 5d^1 6s^2$

Answer: A

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27. Name the gas that can readily decolourise acidified $KMnO_4$ solution:

A. SO_2

B. NO_2

C. P_2O_5

D. CO_2

Answer: A

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28. $HgCl_2$ and I_2 both when dissolved in water containing I^- ions the pair of species formed is:

A. HgI_2, I^-

B. HgI_4^{2-}, I_3^-

C. Hg_2I_2, I^-

D. HgI_2, I_3^-

Answer: B

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29. The reason for greater range of oxidation state in actinoids is attributed to:

A. actinoid contributed to:

B. $5f$, $5d$ and $7s$ levels having comparable energies

C. $4f$ and $5d$ levels being close in energies

D. the radioactive nature of actionoids

Answer: B

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30. Which of the following ions exhibits d-d transitions and paramagnetism as well?

A. CrO_4^{2-}

B. $Cr_2O_7^{2-}$

C. MnO_4^-

D. MnO_4^{2-}

Answer: D

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31. For the redox reaction

$$MnO_4^{\ominus} + C_2O_4^{2-} + H^{\oplus} \rightarrow Mn^{2+} + CO_2 + H_2O$$

the correct coefficients of the reactions for the balanced reaction are

A. MnO_4^- $C_2O_4^{2-}$ H^+
16 5 2

B. MnO_4^- $C_2O_4^{2-}$ H^+
2 5 16

C. MnO_4^- $C_2O_4^{2-}$ H^+
2 16 5

D. MnO_4^- $C_2O_4^{2-}$ H^+
5 16 2

Answer: B

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Aiims Questions

1. Which statement is true about the transitional elements?

A. They exhibit diamagnetism

B. They exhibit inert pair effect

C. They do not form alloys

D. They show variable oxidatio states

Answer: D

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2. The test of of zone O_3 can be done by

A. Ag

B. Hg

C. Au

D. Cu

Answer: B

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3. Which of the following electronic configuration is that of a transitional element?

A. $1s^2, 2s^2p^6, 3s^2p^6d^{10}, 4s^2p^2$

B. $1s^2, 2s^2p^6d^{10}, 4s^2p^1$

C. $1s^2, 2s^2p^6, 3s^2p^6d^2, 4s^2$

D. $1s^2, 2s^2p^6, 3s^2p^6, 4s^2$

Answer: C

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4. Lanthanides and actinides resemble in

A. electronic configuration

B. oxidation state

C. inoization erergy

D. formation of complexes

Answer: B

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5. Which one of the following organisation's iron and steel plant was built to use charcoal as a source of power, to start with, but later switched over to hydroelectricity

A. The Tata Iron and steel company

B. The Indain iron and stell compaly

C. Mysore iron and steel Limited

D. Hindustan steel Limited

Answer: A

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6. Among the following pairs of ions the lower oxidation state in aqueous solution is more stable than the other in

A. Tl, Tl^{3+}

B. Cu^{+}, Cu^{2+}

C. Cr^{2+}, Cr^{3+}

D. V^{+}, VO^{2+}

Answer: A

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7. Which is mild oxidising agent?

A. Ag_2O

B. $KMnO_4$

C. $K_2Cr_2O_7$

D. Cl_2

Answer: A

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8. Nessleers reagent is

A. K_2HgI_4

B. $K_2HgI_4 + KOH$

C. $K_2HgI_2 + KOH$

D. $K_2HgI_4 + Hg$

Answer: B

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9. On adding excess of NH_3 solution to $CuSO_4$ solution, the dark blue colour is due to

A. $\left[Cu(CH_3)_4\right]^{++}$

B. $\left[Cu(NH_3)_2\right]^{++}$

C. $[Cu(NH_3)]^{+}$

D. None of the above

Answer: A

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10. Which of the following compound is not coloured ?

A. Na_2CuCl_4

B. Na_2CdCl_4

C. $K_4Fe(CN)_6$

D. $K_3Fe(CN)_6$

Answer: B

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11. The compound insoluble in water is

A. mercurous nitrate

B. mercuric nitrate

C. mercurous chloride

D. mercurous perchlorate

Answer: C

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12. Mond's process is used for

A. Ni

B. Al

C. Fe

D. Cu

Answer: A

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13. Stainless steel is an alloy of

A. copper

B. nickel and chromium

C. Manganese

D. zine

Answer: B

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14. Percentage of silver in German silver is

A. 0%

B. 1%

C. 5%

D. None of these

Answer: D

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15. Brass in an ally of

A. Zn and Sn

B. Zn and Cu

C. Cu, Zn and Sn

D. Cu and Sn

Answer: B

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16. Most stable oxidation state of iron is

A. $+2$

B. $+3$

C. -2

D. -3

Answer: B

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17. F_2 is formed by reacting K_2MnF_6 with

A. SbF_5

B. MnF_3

C. $KSvF_6$

D. MnF_4

Answer: A

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18. Copper sulphate solution reacts with KCN to give

(a) $Cu(CN)_2$

(b) $CuCN$

(c) $K_2\left[Cu(CN)_4\right]$

(d) $K_3\left[Cu(CN)_4\right]$.

A. $Cu(CN)_2$

B. $CuCN$

C. $K_2\left[Cu(CN)_4\right]$

D. $K_3\left[Cu(CN)_4\right]$

Answer: D

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19. If excess of NH_4OH is added to $CuSO_4$ solution, it forms blue coloured complex which is

A. $Cu(NH_3)_4SO_4$

B. $Cu(NH_3)_2SO_4$

C. $Cu(NH_4)_4SO_4$

D. $Cu(NH_4)_2SO_4$

Answer: A

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20. When metallic copper comes in contact with mositure, a green powdery/pasty coating can be seen over it. This is chemically known as

A. copper sulphide-copper carbonate

B. copper carbonate-copper sulphate

C. copper carbonate-copper hydroxide

D. copper Sulphate-copper sulphide

Answer: C

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21. Which of the following does not react with $AgCl$?

A. $NaNO_3$

B. Na_2CO_3

C. $Na_2S_2O_3$

D. NH_4OH

Answer: A

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22. For making Ag from $AgNO_3$, Which of the following is used?

A. PH_3

B. AsH_3

C. NA_2CO_3

D. NH_3

Answer: A

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23. ZnO when heated with BaO at $1100^\circ C$ gives a compound. Identify the compound

A. $BaZnO_2$

B. $BaO_2 + Zn$

C. $BaCdO_2$

D. $Ba + ZnO_2$

Answer: A

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24. Which of the following metals is obtained by leaching out process using a solution of $NaCN$ and then precipitating the metal by addition of zinc dust?

A. Copper

B. Silver

C. Nickel

D. Iron

Answer: B

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25. Bessemer converter is used for

Atomic nos, $Mn = 25, Fe = 26, Co = 27, Ni = 28$

A. steel

B. wrought iron

C. pig iron

D. cast iron

Answer: C

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26. Conectrated aqueous sodium hydroxide can be a separated mixture of

A. Al^{3+} and Sn^{2+}

B. Al^{3+} and Fe^{3+}

C. Al^{3+} and Zn^{2+}

D. Zn^{2+} and Pb^{2+}

Answer: B

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27. Which of the following oxoacide of phosphorus is a reducing agent and a monobasic acid as well?

A. $H_3P_2O_3$

B. HPO_3

C. H_3PO_3

D. H_3PO_2

Answer: D

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28. Among the following the compound that is both paramagnetic and coloured is

A. $K_2Cr_2O_7$

B. $(NH_4)_2[TiCl_6]$

C. $VOSO_4$

D. $K_3\left[Cu(CN)_4\right]$

Answer: C

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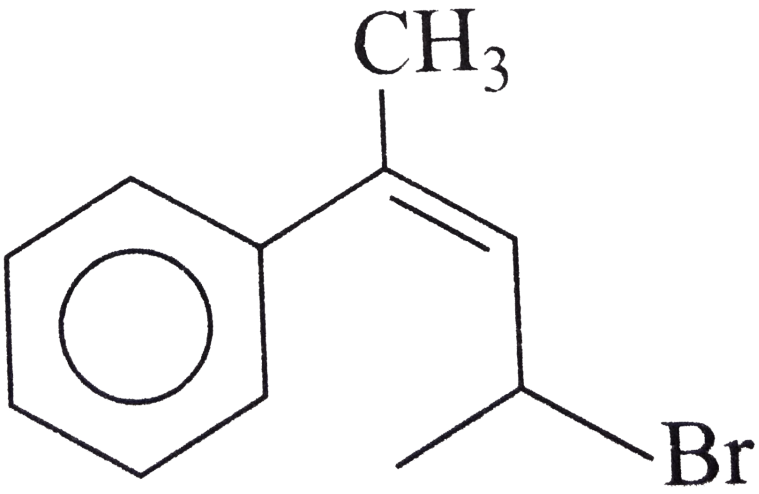
29. What is $IUPAC$ name of the following ?



A. 4-Bromo-2-phenylpent-2-ene

B. 4-Bromo-2-phenylpent-4-ene

C. 4-Bromo-2-phenylpent-2-ene

D. 2-Bromo-4-phenylpent-3-ene

Answer: A

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30. Which is least stable in aqueous medium

A. Fe^{2+}

B. CO^{+2}

C. Ni^{+2}

D. Mn^{+2}

Answer: A

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31. Which of the following can be reduce easily

A. $V(CO)_6$

B. $Mo(CO)_6$

C. Ni^{+2}

D. Mn^{+2}

Answer: A

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Assertion Reasoning Questions

1. Assertion : $HgCl_2$ and $SnCl_2$ exist together in an aqueous solution.

Reason : $SnCl_2$ is a strong reducing agent.

A. If both the assertion and reason are ture but the reason is a true explanation of the assertion.

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

C. If the assertion is true but reason is false

D. If assertion is false but reason is true.

Answer: D

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2. Assertion : The aqueous solution of $FeCl_3$ is basic in nature.

Reason : The colour changes due to the oxidation of potassium chromate.

A. If both the assertion and reason are ture but the reason is a true explanation of the assertion.

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

C. If the assertion is true but reason is false

D. If assertion is false but reason is true.

Answer: D

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3. Assertion: If a strong acid is added to a solution of potassium chromate it changes its colour from yellow to orange.

Reason: The colour change is due to the oxidation of potassium chromate.

A. If both the assertion and reason are ture but the reason is a true explanation of the assertion.

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

assertion

C. If the assertion is true but reason is false

D. If assertion is false but reason is true.

Answer: C

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4. Assertion : $AgNO_3$ produces a black stain on the skin.

Reason : $AgNO_3$ is a dye.

A. If both the assertion and reason are ture but the reason is a true explanation of the assertion.

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

C. If the assertion is true but reason is false

D. If assertion is false but reason is true.

Answer: C

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5. Assertion : $FeSO_4$ (aq) is not a primary standard.

Reason : In aqueous medium, Fe^{2++} ions are not present.

A. If both the assertion and reason are ture but the reason is a true explanation of the assertion.

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

C. If the assertion is true but reason is false

D. If assertion is false but reason is true.

Answer: C

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6. Assertion : Fe_3O_4 is paramagnetic at room temperature and becomes ferromagnetic at $850K$

Reason : The randomization of spin takes place with temperature.

A. If both the assertion and reason are ture but the reason is a true explanation of the assertion.

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

C. If the assertion is true but reason is false

D. If assertion is false but reason is true.

Answer: D

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7. Assertion: In $Cr_2O_7^{2-}$ ion, all the $Cr-O$ bond lengths are equal.

Reason: In $Cr_2O_7^{2-}$ ion all the $O-Cr-O$ bond angles are equal.

A. If both the assertion and reason are ture but the reason is a true explanation of the assertion.

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

C. If the assertion is true but reason is false

D. If assertion is false but reason is true.

Answer: D

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Section D Chapter End Test

1. In a reaction, the ferrous $\left(Fe^{++}\right)$ iron is oxidised to ferric $\left(FE^{++}\right)$ ion. The equivalent weight of the ion in the avbove reaction is equal to

A. Half of the amtoic weight

B. $1/5$ of the atomic weight

C. The atomic weight

D. Twice the atomic weight

Answer: C

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2. One of the following metals froms a volatile corbony1 compound and this property is taken advantage of its extraction. This metal is

A. Iron

B. Nickel

C. Cobalt

D. Tungsten

Answer: B

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3. The main reason for not using a mercury electrolytic cell in $NaOH$ manufacture is that

A. Hg is toxic

B. Hg is a liquid

C. Hg has a high vapour pressrue

D. Hg is a good conductor of electricity

Answer: D

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4. Which of the following statements is not correct about the electronic configuration of gaseou chromium atom

A. It has 5 electrons in $3d$ and one electron in $4s$ orbitals

B. The principal quantum number of its valence electrons are 3 and 4

C. It has 6 electrons in $3d$ orbital

D. Its valance electrons have quantum number $'I'$ 0 and 2

Answer: C

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5. Zn and Hg belong to same group, they differ in many of their properties. The property that is shared by both is

A. They form oxide readily

B. They react with steam readily

C. They react with out concentrated sulphuric acid

D. They react with hot sodium hydroxide

Answer: A

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6. Which one of the following ionic species will not impart colour to an equeous solution?

A. Ti^{4+}

B. Cu^{+}

C. Zn^{2+}

D. Cr^{3+}

Answer: D

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7. The $3d$ metal ions form coloured compounds because the energy corresponding to the following lies in the visible range of electromagnetic spectrum

A. Free energy change of complex formation by $3d$ metal ions

B. d-d transitions of $3d$ electrons

C. Heat of hydration of $3d$ metal ions

D. Ionisation energy of $3d$ metal ions

Answer: B

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8. Identify the transition element

A. $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 4s^2$

B. $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 3d^2 4s^2$

C. $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 3d^{10} 4s^2 4p^2$

D. $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 3d^{10} 4s^2 4p^1$

Answer: B

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9. Potassium permanganate acts as an oxidant in neutral, alkaline as well as acidic media. The final product obtained from it in three condition are respectively:

A. MnO_2, MnO_2, Mn^{2+}

B. $MnO_2^{2-}, Mn^{3+} Mn^{2+}$

C. $MnO_2, MnO_4^{2-}, Mn^{3+}$

D. MnO, MnO_4, Mn^{2+}

Answer: A

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10. In acidic medium potassium dichromate acts as on oxidant according to the equation,

$Cr_2O + 14H^+ + 6e^- \rightarrow 2Cr^{3+} + 7H_2O$. What is the equivalent weight of $K_2Cr_2O_7$? (mol. $Wt. = M$)

A. M

B. $M/2$

C. $M/3$

D. $M/6$

Answer: D

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11. $AgCl$ dissolves in a solution of NH_3 but not in water because

A. NH_3 is a better solvent then H_2O

B. Ag^+ forms a complex ion with NH_3

C. NH_3 is a stronger base than H_2O

D. The dipole moment of water is higher than NH_3

Answer: B

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12. Verdigris is

A. Basic copper acetate

B. Basic lead accetate

C. Basic lead

D. None of these

Answer: A

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13. Light green crystals of ferrous sulphate lose water molecules and turn brown on exposure to air. This is due to its oxidation to

A. Fe_2O_3

B. $Fe_2O_3 . H_2O$

C. $Fe(OH)SO_4$

D. $Fe_2O_3 + FeO$

Answer: C

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14. Among TiF_6^{2-}, CoF_6^{3-}, Cu_2C1_2 and $NiC1_4^{2-}$ (At. No. $Ti = 22, Co = 27, Cu = 29, Ni = 28$), the colourless species are -

A. CoF_6^{3-} and $NiCl_4^{2-}$

B. TiF_6^{2-} and CoF_6^{3-}

C. Cu_2Cl_2 and $NiCl_4^{2-}$

D. TiF_6^{2-}, and Cu_2Cl_2

Answer: D

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15. Potassium permanganate works as oxidising agent both in acidic and basic medium. In bot state product obtained by $KMnO_4$ is respectively

A. MnO_2^- and Mn^{3+}

B. Mn^{3+} and Mn^{2+}

C. Mn^{2+} and MnO_2

D. MnO_2 and Mn^{2+}

Answer: D

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16. Which method of parification is represented by the following equation ?

$$Ti(s) + 2I.(2)(g) \rightarrow TiI_4(g) \rightarrow Ti(s) + 2I_2(g)$$

A. Cupellation

B. van Arkel process

C. Electrolytic refining

D. Zone refining

Answer: B

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17. Which of the following sulphides when heated strongly in air gives the corresponding metal?

A. Cu_2S

B. HgS

C. Fe_2S_3

D. FeS

Answer: B

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18. Guignet's green is known as

A. $Cr_2O_32H_2O$

B. $FeO_3 . 2H_2O$

C. Cu_2O_3

D. $FeCO_3 . Cr_2O_3$

Answer: A

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19. Excess of KI reacts with $CuSO_4$ solution and Na_2SO_3 solution is added to it. Which of the following statements in incorrect for the reaction?

A. $Na_2S_2O_3$ is oxidised

B. Cul_2 formed

C. Cu_2I_2 is formed

D. Evolved I_2 is reduced

Answer: B

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20. When concentrated sulphuric acid is added slowly to a solution of ferrous sulphate containing nitrate ion, a brown colour ring is formed. The compositionn of the ring is

A. $\left[Fe(H_2O_2)_5NO\right]SO_4$

B. $FeSO_4.NO_2$

C. $Fe[H_2O)_5](NO_3)_2$

D. None of these

Answer: A

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21. Railway wagon axles are made by heating rods of iron embedded in charcoal powerder. The process is known as

A. Case hardening

B. Sherardizing

C. Annelaing

D. Tempering

Answer: A

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22. A blue colouration is not obtained when

A. Ammonium hydroxide dissolves in copper sulphate

B. copper sulphate solution reacts with $K_4\left[Fe(CN)_6\right]$

C. Ferric chloride reacts with sodium ferrocyanide

D. Anhydrous $CuSO_4$ is dissolved in water

Answer: B

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23. General configuration of outermost and penultimate shell is $(n-1)s^2(n-1)p^6(n-1)d^x ns^2$. If $n=4$ and $x=5$ then no. of protons in the nucleus will be

A. > 25

B. < 24

C. 25

D. 30

Answer: C

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24. $KMnO_4$ reacts with ferrous ammonium sulphate according to the equation $MnO_4^- + 5Fe^{2+} + 8H^+ \rightarrow Mn^{2+} + 5Fe^{3+} + 4H_2O$, here $10ml$ of $0.1MKMnO_4$ is equivalent to

A. $20ml$ of $0.1mFeSO_4$

B. $30ml$ of $0.1MFeSO_4$

C. $40ml$ of $0.1MFeSO_4$

D. $50ml$ of $0.1MFeSO_4$

Answer: D

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25. In nitroprusside ion, the iron and NO exist as $Fe(II)$ and NO^+ rather than Fe^{III} and NO. These forms can be differentiated by

A. Estimating the conectration of iron

B. Measuring the concentration of $CN-$

C. Measuing the solid state magnetic moment

D. Thermally decomposing the compound

Answer: C

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26. The number of mole of $KMnO_4$ that will be needed to react completely with one mole of ferrous oxalate in acidic solution is:

A. $3/5$

B. $2/5$

C. $4/5$

D. 1

Answer: A

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27. Out of the all known elements, the percentage of transitional elements is approximately

A. $30\ \%$

B. $50\ \%$

C. $60\ \%$

D. $75\ \%$

Answer: C

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28. Assetion : Permanganate titrations is not carried out in presence of hydrochloric acid.

Reason : Hydrochloric acid is oxidised to chlorine.

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

B. If both assertion and reason are ture and reason is not the correct explanationof the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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29. Assertion : FeI_3, CuI_2, PbI_4 do not exist but FeF_3, CuF_2, PbF_4 exist.

Reason : F_2 having highest oxidising power whereas I_2 having least oxidising power among halogens.

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

B. If both assertion and reason are ture and reason is not the correct explanationof the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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30. Assertion : $CuSO_4.5H_2O$ on heating to $250^\circ C$ losses all the five H_2O molecules and becomes anhydrous.

Reason : All five H_2O molecules are coordinated to the central Cu^{2+} ion.

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

B. If both assertion and reason are ture and reason is not the correct explanationof the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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