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CHEMISTRY

JEE (MAIN AND ADVANCED) CHEMISTRY

D - BLOCK ELEMENTS

Problems

1. What are coinage metals? Are they transition elements?

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2. Which element has pseudo inert gas electronic configuration ?

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3. Elements with the general electronic configuration $(n-1)d^3ns^2$ belong to which group in the modern periodic table ?

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4. Among Cu, Ag, Zn and Cd which one is the biggest atom? why?

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5. Why the decrease in atomic radius amongst a series of transition elements is less when compared with representative elements ?

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6. Among $3d-$, $4d-$ and $5d-$ series elements, which elements has the least and which has the highest I_l?

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7. Name a transition element which does not exhibit variable oxidation states.

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8. Among ferrous and ferric ions, which one is more stable? Why?

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9. Arrange the MnO_4^-, $Cr_2O_7^{2-}$ and Votions in the increasing order of their oxidising power.

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10. $FeCl_3$ is known but not FeI_3 Why?

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11. Why is Cr^{2+} reducing and Mn^{3+} oxidizing even though both have the same d^4 electronic configuration.

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12. Which is a stronger reducing agent Cr^{2+} or Fe^{2+} and why ?

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13. Why is the $E^{\ominus}$ value for the Mn^{3+}/Mn^{2+} couple much more position than that for Cr^{3+}/Cr^{2+} or Fe^{3+}/Fe^{2+} ? Explain.

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14. What is the value of one Bohr magneton in S.I. units?

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15. Calculated spin only magnetic moment of Cr^{x+} is 4.9 BM. Find the 'x' value.

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16. $CaCl$ is colourless, while $CuSO_4.5H_2O$ is coloured. Explain?

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17. Eventhough Cu^{2+} has one unpaired d - electron, anhydrous copper sulphate is colourless. Why?

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18. Au(I) is diamagnetic, while Au(III) has a magnetic moment of 2.95 BM. Predict the colour of aurous and auric ions?

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19. Give some examples of the ions which are coloured but diamagnetic in nature.

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20. Why transition metals act as good catalysts ?

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21. Copper is prepared as alloying element in ornamental gold. Why?

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22. Potassium dicharomate solution is used to test drunker driver? Discuss.

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23. Vanadium pentoxide is coloured. Why?

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24. What is chemical volcano ?

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25. How many moles of $KMnO_4$ are required to oxidise one mole of ferrous oxalate in acidic medium ?

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26. Variability in the oxidation states of lanthanides is limited. Why?

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27. In lanthanide series, which element is well known to exhibit $+4$ oridation state ? Why?

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28. Why $\ln^{2+}$ ions are reductants and $\ln^{4+}$ are oxidants ?

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29. Why actinides are not affected by nitric acid ?

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30. Actinides are called transuranic elements. Explain.

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31. Name a member of the lanthanoid senes which is well known to exhibit +4 oxidation state.

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32. Complex compounds of transition metals are familier, but not inner transition elements. Why?

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33. Actinoid contraction is greater from element to element than lanthanoid contraction. why?

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Subjective Exercise 1 Short Answer Questions

1. Name some d-block elements which have anamolous electronic configurations. Give their outer shell configurations.

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2. Write the configuration of Cut, `Cu^(+), Co^(2+), Mn^(2+),

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3. Name the minerals of manganese and iron. Write their composition.

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4. Write the important minerals of the following elements of d-block : titanium, cobalt, nickel, copper, zinc and silver.

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Subjective Exercise 1 Very Short Answer Questions

1. Mention the d-block elements which are not considered as transition metals.

2. Write the electronic configurations of Cr and Cu.

3. How many d - electrons are present in Ag and Ni atoms ?

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4. Name the most abundant element present in earth's crust.

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Subjective Exercise 2 Long Answer Questions

1. What is meant by variable oxidation states?

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2. How does manganese show its variable oxidation states?

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3. The atomic radius along the 3d series decreases. Explain on the basis of their electron configuration.

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4. The colour of $\left[Ti(H_2O)_6\right]^{3+}$ is due to

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5. How does a catalyst work in a chemical reaction? Discuss the catalysis with suitable examples.

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6. How do you classify magnetic substances? Give two examples each.

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Subjective Exercise 2 Short Answer Questions

1. What are alloys? How are they prepared?

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2. What do you understand by non-stoichio metric compounds?

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3. Discuss the colour of the transition metal compounds with suitable examples.

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4. Explain the magnetic properties of first transition series metal ions.

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5. Wtite the characteristic properties of transition elements.

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6. Transition elements have high melting points.

Why ?

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7. $CuSO_4.5H_2O$ has pale blue colour while $ZnSO_4, 7h_2O$ is white. Discuss.

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8. Predict which of the following will be coloured in aqueous solution? $Ti^{3+}, V^{3+}, Cu^{+}, Sc^{3+}, Mn^{2+}, Fe^{3+}$ and Co^{2+}. Give reasons for each

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9. The most common oxidation state of first transition series is $+2$. Explain.

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10. Wtite the characteristic properties of transition elements.

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Subjective Exercise 2 Very Short Answer Questions

1. What is the highest oxidation state exhibited by a 3d element ?

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2. The most common oxidation state of first transition series is $+2$. Explain.

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3. Why do transition metals show a number of oxidation states ? Explain.

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4. Ferrous salts are more unstable compared to ferric salts. Explain in terms of their configurations.

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5. $CuSO_4$ is paramagnetic while $ZnSO_4$ is diamagnetic, Explain in terms of the electron configurations.

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6. Give the composition of Nichrome ?

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7. Give the composition and uses of Duralumin.

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8. Write the chracteristics of non-stoichiometric compounds.

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9. Which metalsform interstititial oxides ?

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10. The formula of Zirconium hydride is not represented as ZrH_4 but $ZrH_{1.92}$. Why?

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Subjective Exercise 3 Short Answer Questions

1. How the acidic nature, covalent character changes with the oxidation state for oxides of a transition metal.

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2. Describe the preparation of potassium permanganate.

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3. Write the oxidation properties of $KMnO_4$ in acidic and neutral medium.

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4. Write any four oxidising properties of potassium dichromate.

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Subjective Exercise 3 Very Short Answer Questions

1. Identify the oxidation states of Mn when MnO_3^{3-} ion undergoes disproportionation reaction under acidic medium

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Subjective Exercise 4 Short Answer Questions

1. What are the different oxidation states exhibited by the lanthanoids ?

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2. What is lanthanoid contraction ? What are the consequences of lanthanoid contraction?

Subjective Exercise 4 Very Short Answer Questions

1. Is Lanthanum a real lanthanide element ? Why? or Why not?

2. Why are lanthanides and Actinides are placed sepatately at the bottom of the peridic table ?

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3. Fill up the blanks with nl formula for lanthanons : [Pr].....

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Objective Exercise 1 General Properties And Electronic Configuration

1. Which of the following is transition element

A. Pb

B. Sn

C. Cr

D. Zn

Answer: C

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2. Liquid metal among d-block elements is

A. Hg

B. Zn

C. Nb

D. Cd

Answer: A

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3. Outer electronic configuration of the element Palladium is

A. $4d^5 5s^1$

B. $4d^9 5s^2$

C. $4d^{10} 5s^1$

D. $4d^{10} 5s^0$

Answer: D

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4. Among the first transition series (3d series) Chromium has highest melting point. Why?

A. V

B. Zn

C. Cu

D. Cr

Answer: D

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5. Which of the following orbitals are filled progressively in the transition elements

A. s

B. p

C. d

D. f

Answer: C

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6. Which set of elements among the following are called non-transitional elements

A. Cu, Ag and Au

B. Fe, Co and Ni

C. Zn, Cd and Hg

D. Re, Os and Ir

Answer: C

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7. Iron catalyst is used in

A. Contact process

B. Ostwald's process

C. Birkland - Eyde process

D. Haber's process

Answer: D

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8. The changed name of Khurchatovium (Z=104) is

A. Joliotium

B. Dubnum

C. Rutherfordium

D. Hatrium

Answer: C

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9. The number of electrons in 4d-subshell of 'Pd' is

A. 7

B. 8

C. 9

D. 10

Answer: D

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10. Electronic configuration of Ferrous ion is

A. $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6 4s^0$

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

C. $1^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^1$

D. $1s^2 2s^2 2p^6 2p^6 3s^2 3p^6 3d^5 4s^0$

Answer: A

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11. Which one of the following pairs of ions have the same electronic configuration

A. Cr^{3+} and Fe^{3+}

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

C. Fe^{3+} and Co^{3+}

D. Sc^{3+} and Cr^{3+}

Answer: B

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12. How many 'd' electrons are present in Cr^{2+} ion?

A. 4

B. 5

C. 6

D. 3

Answer: A

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13. What kind of electronic transition take place in the exhibition of colour by transition metal ions

A. d to s

B. s to p

C. d to d

D. f to s

Answer: C

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14.

Configuration	Element
1) $5s^1 4d^5$	A) Cu
2) $6s^1 5d^{10}$	B) Pd
3) $4s^1 3d^{1-}$	C) Mo
4) $5S^2 4d^{10}$	D) Cr
	E) Au

The correct match is

A. $1-C, 2-A, 3-E, 4-B$

B. $1-C, 2-E, 3-B, 4-A$

C. $1-C, 2-E, 3-A, 4-B$

D. $1-E, 2-C, 3-A, 4-B$

Answer: C

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15. Number of d'electrons present in M shell of $Ag+$ ion?

A. 10

B. 20

C. 18

D. 16

Answer: A

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16. Which one of the element may be expected to show highest second ionization enthalpy

A. V

B. Cr

C. Mn

D. Fe

Answer: B

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Objective Exercise 1 Oxidation States

1. Among the following outer electronic configurations of atoms, the highest oxidation state is exhibited by

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

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

C. $(n-1)d^3ns^1$

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

Answer: B

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2. The common oxidation state exhibited by transition elements is

A. $+II$

B. $+IV$

C. $+VI$

D. $+VII$

Answer: A

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3. Which of the following transition elements exhibit $+8$ oxidation state

A. Cu and Zn

B. Ru and Os

C. W and Pb

D. Ag and Au

Answer: B

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4. Manganese exhibits oxidation states from

A. $+II \text{ to } +VII$

B. $+I \text{ to } +VI$

C. $+I \text{ to } +V$

D. $+III \text{ to } +V$

Answer: A

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5. The most stable oxidation state of Iron is

A. $+II$

B. $+III$

C. $+I$

D. $+VI$

Answer: B

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6. The maximum oxidation state in 3d series elements is shown by

A. Cu

B. V

C. Mn

D. Fe

Answer: C

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7. The transition element that has stable configuration in $+1$ oxidation state is

A. Cu

B. Zn

C. Sc

D. Mn

Answer: A

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8. Divalent Manganese is more stable due to

A. $3d^4$ configuration

B. $3d^2$ configuration

C. $3d^5$ configuration

D. $3d^3$ configuration

Answer: C

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9. The oxidation state of "Ni" in $Ni(CO)_4$ is

A. $+II$

B. zero

C. $+III$

D. $+VIII$

Answer: B

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10. The element which has half-filled d-orbitals in its $'+1'$ oxidation state is

A. Mn

B. Cr

C. Zn

D. Fe

Answer: B

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Objective Exercise 1 Colours

1. Coloured complexes absorb radiation in the

A. visible region

B. infrared region

C. U.V. region

D. far IR region

Answer: A

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2. Coloured ion among the following is

A. Zn^{2+}

B. Mn^{2+}

C. Cu^{1+}

D. Ti^{4+}

Answer: B

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3. In aqueous solution which of the following colour is exhibited by Nici,

A. pink

B. green

C. blue

D. yellow

Answer: B

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4. The ion which exhibits orange red colour in aqueous solution is

A. $Cr_2O_7^{2-}$

B. MnO_4^{2-}

C. MnO_4^-

D. Cr^{3+}

Answer: A

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5. The following ion is colourless in aqueous solution ?

A. Ti^{2+}

B. Cu^{2+}

C. Ni^{2+}

D. Zn^{2+}

Answer: D

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6. Which of the following pairs of ions are colourless?

A. Ti^{+3}, Cu^{+2}

B. Sc^{+3}, Zn^{+2}

C. Co^{+2}, Fe^{+3}

D. Ni^{+2}, V^{+3}

Answer: B

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7. The following ion exhibits colour in aqueous solution ?

A. Sc^{3+}

B. Cu^{+}

C. Ni^{2+}

D. Zn^{2+}

Answer: C

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8. The atomic number of an element 'M' is 26. How many electrons are present in the M-shell of the element in its M^{3+} state ?

A. 5

B. 14

C. 12

D. 13

Answer: D

9. Paramagnetism is the property of

A. completely filled electronic subshells

B. unpaired electrons

C. non-tranistion elements

D. vacant orbitals

Answer: B

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Objective Exercise 1 Magnetic Properties

1. The formula to calculate paramagnetic moment of a substance is

A. $\mu_S = \sqrt{4S(S+2)}B.\ M$

B. $\mu_S = \sqrt{n(n+2)}B.\ M$

C. $\mu_S = \sqrt{n(n+4)}B.\ M.$

D. $\mu_S = \sqrt{L(L+2)}B.\ M$

Answer: B

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2. The units of magnetic moment are

A. Newton - ohm

B. Torrs

C. Bohr magneton

D. Pascals

Answer: C

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3. Which of the following would be attracted towards magnetic field

A. Zn

B. Mn

C. Mg

D. Cd

Answer: B

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4. Magnetic moment of diamagnetic substance in Bohr magnetons is

A. 1.73

B. 2.83

C. 5.0

D. 0

Answer: D

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5. Which of the following set of elements are Ferromagnetic in nature

A. Zn, Cd and Hg

B. Cu, Ag and Au

C. Fe, Co and Ni

D. Sc, Ti and U

Answer: C

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6. Substances which are repelled by the external magnetic field are called

A. diamagnetic

B. paramagnetic

C. ferromagnetic

D. antiferromagnetic

Answer: A

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7. The following is paramagnetic

A. $CaCl_2$

B. $CuCl_2$

C. $ZnCl_2$

D. $NaCl$

Answer: B

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8. The following ion exhibits highest magnetic moment ?

A. Cu^{2+}

B. Ti^{3+}

C. Ni^{2+}

D. Mn^{2+}

Answer: D

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9. The calculated magnetic moment of Cu^{2+} ion

A. 1.73 B.M.

B. zero

C. 2.6 B.M.

D. 5 and 5.92 B.M.

Answer: A

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10. The number of d-electrons present in 'X' and its magnetic moment are

A. $Ti^{+2}\&V^{+2}$

B. $Fe^{+2}\&Cd^{+2}$

C. $Cr^{+2}\&Fe^{+2}$

D. $Co^{+2}\&Ti^{+2}$

Answer: B

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11. Which of the following pair of transition metal ions, have the same calculate values of magnetic moment ?

A. Co^{2+}

B. Cu^{2+}

C. Mn^{2+}

D. Sc^{3+}

Answer: C

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12. Which one of the following is diamagnetic?

A. Mn^{+2}

B. Fe^{+2}

C. Ti^{+2}

D. Cr^{+3}

Answer: D

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13. Which of the following ions exhibits maximum magnetic moment

A. 1.73 BM

B. 2.84 BM

C. 4.9 BM

D. 0

Answer: A

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14. The spin only magnetic moment of Ni^{2+} in aquous solution would be

A. $\sqrt{8}$

B. $\sqrt{2}$

C. $\sqrt{6}$

D. √15

Answer: B

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Objective Exercise 1 Alloys

1. Brass is an alloy of

A. $Cu + Sn$

B. $Cu + Zn$

C. Sn and Zn

D. Cu, Zn and Sn

Answer: A

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2. Bronze is an alloy of

A. $Cu + Sn$

B. $Cu + Zn$

C. $Pb + Sn + Zn$

D. $Pb + Zn$

Answer: A

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3. The metal not present in german silver is

A. Ag

B. Cu

C. Ni

D. Zn

Answer: A

4. The transition element with highest density among the following is

A. Sc

B. Fe

C. Zn

D. Cu

Answer: D

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5. Percentage of carbon in the steels is nearly

A. 3%

B. 2%

C. 0.2%

D. 10%

Answer: B

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Objective Exercise 1 Interstitial Compounds

1. Which of the following is an interstitial compound

A. NH_3

B. $PdCl_2$

C. TiH

D. ZnO

Answer: C

2. The non-metal that usually occupies tetrahedral voids in the formation of interstetial compounds

A. Hydrogen

B. Boron

C. Carbon

D. Sulphur

Answer: A

3. The type of bond expected to be formed atoms between of two elements in interstitial compounds is

A. Covalent

B. Ionic

C. Metallic

D. None

Answer: D

4. Which of the following is not the property of interstitial compound

A. They have high M.P, higher than those of pure metals

B. They are very hard, some borides approach diamond in hardness.

C. They retain metallic conductivity

D. Their chemical reactivity is very high

Answer: D

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Objective Exercise 1 Permanganate Dichromate

1. Strongest oxidant among the following is

A. VO_2^+

B. $Cr_2O_7^{-2}$

C. MnO_4^-

D. MnO_4^{-2}

Answer: C

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2. Highest tendency for $M^{+3} \rightarrow M^{+2}$ is in

A. Mn

B. Cr

C. Fe

D. All have same

Answer: A

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3. Match the following

SET - I	SET - II
A) Mn_2O_7	1) Covalent green oil
B) CrO_3	2) Basic
C) V_2O_5	3) amphoteric
D) CrO	4) anhydride of cromic acid
	5) acidic

A.

A	B	C	D
1	4	3	2

B.
A	B	C	D
2	4	3	1

C.
A	B	C	D
4	5	1	3

D.
A	B	C	D
3	2	4	1

Answer: A

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4. When MnO_2 is fused with KOH in air, it gives

A. $KMnO_4$

B. FeC_2O_4

C. $Fe_2(C_2O_4)_3$

D. $Fe_2(SO_4)_3$

Answer: C

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5. Which of the following cannot be oxidised by the acidified solution of $KMnO_4$

A. $FeSO_4$

B. FeC_2O_4

C. $Fe_2(C_2O_4)_3$

D. $Fe_2(SO_4)_3$

Answer: D

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6. An acidified solution of $KMnO_4$ oxidises

A. Sulphates

B. Oxalates

C. Iodine

D. Ferric ion

Answer: B

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7. To an acid solution of an anion, a few drops of $KMnO_4$ solution are added. Which of the following, if present will not decolourise the $KMnO_4$ solution

A. CO_3^{2-}

B. NO_2^-

C. SO_3^{2-}

D. Cl^-

Answer: A

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8. $KMnO_4$ acts as an oxidising agent in

A. Acidic medium only

B. Neutral and acidic medium

C. Neutral and alkaline medium

D. Neutral, acidic and fairly basic medium

Answer: D

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

A. Both $FeSO_4$ and $KMnO_4$ are oxidised

B. Both $FeSO_4$ and $KMnO_4$ are reduced

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

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

Answer: C

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10. Permeanganate ion is not isostructural with

A. managanate ion

B. Cromate ion

C. Chlorate ion

D. Perchlorate ion

Answer: C

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11. When mangnese dioxide is fused with KOH in air, it gives

A. Potassium permangante

B. Potassium manganate

C. manganese hydroxide

D. managanese sesquioxide

Answer: B

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12. The number of moles of $KMnO_4$ that will be needed to react completely with one mole of ferrious oxalate in acidic solution is

A. $\frac{3}{5}$

B. $\frac{2}{5}$

C. $\frac{4}{5}$

D. 1

Answer: A

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13. The product of oxidation of I^- with MnO_4^- in alkaline medium is

A. IO_3^-

B. I_2

C. IO^-

D. IO_4^-

Answer: A

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14. Number of $Cr-O$ sigma bonds in dichromate ion $Cr_2O_7^{2-}$ is

A. 6

B. 7

C. 8

D. 4

Answer: C

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15. Which of the following oxides give chromic acid in sulphuric acid solutions

A. CrO

B. Cr_2O_3

C. CrO_3

D. CrO_2

Answer: C

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16. Number of moles of $K_2Cr_2O_7$ reduced by one mole of Sn^{2+} ions is

A. $1/3$

B. 3

C. $1/6$

D. 6

Answer: A

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17. Which of the following statements is/are true

A) Na_2r_2, O_7 is more soluble in water than

$K_2CR_2O_7$

B) $K_2Cr_2O_7$ is used as a primary standard in volumetric analysis

C) Both $Na_2Cr_2O_7$ and $K_2Cr_2O_7$ are strong oxidizing agents

D) The chromates and dichromates are interconvertible in aqueous solutions

A. A and B

B. B and C

C. A and D

D. All the above

Answer: D

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18. The shape of chromate ion is

A. tetrahedral

B. square planar

C. two tetrahydra linked at one of their apex

D. octahedral

Answer: A

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19. When Na_2CrO_4, is dissolved in sulphuric acid, it changes to

A. orange coloured $Na_2Cr_2O_7$

B. yellow coloured $Na_2Cr_2O_7$

C. retains as orange coloured Na_2CrO_4

D. retains as yellow coloured Na_2CrO_4

Answer: A

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20. Oxidation number of chromium in chromyl chloride is

A. $+2$

B. $+3$

C. $+4$

D. $+6$

Answer: D

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21. For the reaction $CrO_4^{2-} + ? \rightarrow Cr_2O_7^{-2}$ the missing ion is

A. OH^-

B. H^+

C. OH^+

D. O^{2-}

Answer: B

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Objective Exercise 1 Lanthanides And Actinides

1. Which element among the lanthanides has the smallest atomic radius

A. Cerium

B. Lutetium

C. Europium

D. Gadolinium

Answer: B

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2. The electronic configuration of gadolinium (At No. = 64) is

A. $[Xe]4f^8 5d^9 6s^2$

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

C. $[Xe]4f^3 5d^5 6s^2$

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

Answer: B

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3. Across the lanthanide series, the basic strength of the lanthanide hydroxides

A. Increases

B. Decreases

C. First increases and then decreases

D. First decreases and then increases

Answer: B

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4. Most common oxidation states shown by cerium are

A. $+2, +4$

B. $+3, +4$

C. $+3, +5$

D. $+2, +3$

Answer: B

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5. 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 element 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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6. Arrange $Ce^{3+}, La^{3+}, Pm^{3+}$ and Yb^{3+} in increasing order of their ionic radii

A. $Yb^{3+} < Pm^{3+} < Ce^{3+} < La^{3+}$

B. $Ce^{3+} < Yb^{3+} < Pm^{3+} < La^{3+}$

C. $Yb^{3+} < Pm^{3+} < La^{3+} < Ce^{3+}$

D. $La^{3+} < Ce^{3+} < Yb^{3+} < Pm^{3+}$

Answer: A

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7. The basic character of the transition metal monoxides follows the order

A. $VO > CrO > TiO > FeO$

B. $CrO > VO > FeO > TiO$

C. $TiO > FeO > Vo > CrO$

D. $TiO > VO > CrO > FeO$

Answer: D

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8. Which of the following is a lanthanide ?

A. Ta

B. Rh

C. Th

D. Lu

Answer: D

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9. Which of the two have almost similar size

A. ${}_{22}Ti$ and ${}_{40}Zr$

B. ${}_{41}Nb$ and ${}_{73}Ta$

C. ${}_{39}Y$ and ${}_{57}La$

D. ${}_{20}Ca$ and ${}_{31}Ir$

Answer: B

View Text Solution

10. In aqueous solutions Eu^{2+} acts as

A. an oxidising agent

B. a reducing agent

C. neither oxidant nor reductant

D. can act as redox agent

Answer: B

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11. The radius of $La^{3+}(Z = 57)$ is $1.06A^{\circ}$. Which one of the following given values will be closest to the radius of Lu^{3+}

A. $1.60A^{\circ}$

B. $1.40A^{\circ}$

C. $1.06A^{\circ}$

D. $0.85A^{\circ}$

Answer: D

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12. The actinide element which can exhibit $+7$ oxidation state in its compounds

A. Thorium

B. Curium

C. Neptunium

D. Nobelium

Answer: C

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13. Highest oxidation state exhibited by an actinide element in its compounds is

A. $+4$

B. $+6$

C. $+7$

D. $+8$

Answer: C

Watch Video Solution

14. Actinide that is naturally available with highest isotopic number

A. U

B. Pu

C. Cu

D. Fm

Answer: A

Watch Video Solution

15. Manganese dioxide is used in

A. Pigment industry

B. dry battery cells

C. making coins

D. Photography

Answer: B

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16. Zeiglar catalysis utilises a mixture of trialkylaluminium and a chloride of the element

A. Sc

B. Ti

C. V

D. Cr

Answer: B

Watch Video Solution

17. Silver UK coins are made up with an alloy

A. Cu, Fe

B. Ni, Cd

C. Cu, Ni

D. Au, Ag

Answer: C

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18. Photography is based on special light sensitive properties of

A. TiO

B. V_2O_5

C. $\left[Ag(S_2O_3)_2\right]^{3-}$

D. $AgBr$

Answer: D

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19. Oxidation of an alkyne to the corresponding carbonyl compound is catalysed by

A. $PdCl_2$

B. $TiCl_4$

C. MnO

D. TiO

Answer: A

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Objective Exercise 1 Assertion And Reason Type

1. (A): Fe^{+3} is more stable than that of Fe^{+2}.

(R) : Fe^{+3} ion has half filled 3d orbital whereas Fe^{+2} does not.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

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2. (A): Sc^{+3} ion in aqueous solutions is colorless

(R) : Ions with do configuration are colorless

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

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3. (A): Cu^+ is diamagnetic

(R): Ions with dl configuration are diamagnetic

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

View Text Solution

4. (A): Transition elements form alloys easily

(R) : Transition elements have high melting points

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: B

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5. (A): Transition elements form alloys very easily.

(R): They exhibit variable oxidation states.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: B

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6. (A): Elements of second and third transition series have nearly same atomic radii

(R): Lanthanide contraction is observed in the elements from atomic number 58 to 71.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

7. (A) : Transition metals form colored ions

(R): They have completely filled d-orbitals in the nth shell.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: C

Watch Video Solution

8. (A): Magnetic moment of Mn^{+2} is 5.8 B.M

(R): Mn^{+2} has five unpaired electrons

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

Watch Video Solution

9. (A) : Cu^{+2}(aq) is more stable than $Cu^{+}(aq)$

(R): Heat of hydration of Cu^{+2} is more than IP_2 of Cu

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

10. (A): Zn(II) compounds are diamagnetic.

(R): Zn(II) has all its electrons paired.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

Watch Video Solution

11. (A): FeO is basic in character.

(R): Oxides of transition metals are basic when metal is in lower oxidation state.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

Watch Video Solution

12. (A): Pyrolusite is an ore of manganese.

(R) : Formula of pyrolusite is Mn_3O_4.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: C

Watch Video Solution

13. (A): Equivalent mass of $K_2Cr_2O_7$, when it acts as oxidizing agent in acidic medium, is M/3

(R) : During reduction, oxidation number of chromium changes from $+6$ to $+3$

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: D

Watch Video Solution

14. (A): $Ti(IV)$ in aqueous solutions is colour less.

(R): $Ti(IV)$ has no electrons in d-subshell.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

Watch Video Solution

15. (A): In alkaline medium, $KMnO_4$ oxidizes iodides to iodates.

(R): $KMnO_4$ behaves as stronger oxidizing agent in alkaline medium than in acidic medium.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: C

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16. (A): Zr and Hf have nearly equal atomic radii.

(R): Zr and Hf belong to the same group.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: B

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17. (A) : The most common oxidation state of lanthanides is $+3$.

(R): Lanthanides have three electrons in their outermost shell.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: C

View Text Solution

18. (A): Ce^{4+} is a good oxidizing agent.

(R): Sm^{2+} is a good reducing agent.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: B

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19. (A): Zinc does not show characteristic properties of transition metals

(R): The outer most shell of zinc is completely filled

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

 Watch Video Solution

20. (A): K_2CrO_4 has yellow colour due to charge transfer

(R) : CrO_4^{2-} ion is tetrahedral in shape.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: B

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Objective Exercise 2 General Properties And Electronic Configuration

1. The following represents the electronic configuration of a transition element

A. bs^2np^3

B. $ns^2np^6nd^3(n+1)s^2$

C. $ns^2np^6nd^{10}(n-1)s^2(n+1)p^4$

D. ns^2np^5

Answer: B

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2. Which of the following statements concerning transition elements is not true?

A. They are all metals

B. They easily form complexes

C. Compounds containing their ions are coloured

D. They show multiple oxidation states always differing by two units.

Answer: D

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3. The highly stable pair of ions are

A. Fe^{2+} and Fe^{3+}

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

C. Fe^{3+} and Mn^{2+}

D. Fe^{3+} and Fe^{4+}

Answer: C

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4. Transition metal " X " has a configuration $[Ar]3d^4$ in its $+3$ oxidation state . The atomic number of the metal is

A. 25

B. 26

C. 32

D. 19

Answer: A

5. The number of 'd' electrons in Fe^{2+} is not equal to that of

A. s-electrons in Mg

B. p-electrons in Ne

C. p-electrons in Cl

D. d-electrons in Fe

Answer: C

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6. The pair of ions which do not have same number of unpaired electrons is

A. Mn^{2+} and Fe^{3+}

B. Ti^{2+} and Ni^{2+}

C. Cu^{2+} and Ti^{3+}

D. Fe^{2+} and Ni^{2+}

Answer: D

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Objective Exercise 2 Oxidation States

1. Gold can exhibit the oxidation states

A. I and $+II$

B. $+II$ and $+III$

C. $+I$ and $+III$

D. $+II$ and $+IV$

Answer: C

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2. The electronic configuration of a transition element is $[Ar]4s^2 3d^3$. The possible oxidation states are

A. $+1,\ +2$ and $+3$ only

B. $+2$ and $+3$ only

C. $+2,\ +3,\ +4$ and $+5$ only

D. $+2$ and $+5$ only

Answer: C

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3. The transition element having highest oxidation state belongs to which group?

A. VIII

B. VII_B

C. V_B

D. IV_B

Answer: A

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Objective Exercise 2 Colours

1. The formation of coloured ions by transition metals is due to

A. incompletely filled 'd' orbitals

B. completely filled 'd' orbitals

C. completely filled 's' and 'd' orbitals

D. formation of interstitial compounds

Answer: A

 Watch Video Solution

2. Element furnishing coloured ions in the aqueous medium is

A. Zn

B. Hg

C. Cu

D. Al

Answer: C

Watch Video Solution

3. The colour of $\left[Ti(H_2O)_6\right]^{3+}$ is due to

A. absence of unpaired electrons in 'd' orbtials

B. charge transfer phenomenon

C. d-d electron transition

D. close packing crystal structure

Answer: C

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4. Transition metal which forms green compounds in its $+3$ oxidation state and orange red compounds in its $+6$ oxidation state is

A. Cobalt

B. Chromium

C. Iron

D. Nickel

Answer: B

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5. Which of the following is a correct statement?

A. Aq.solutions of Cu^{+} and Zn^{2+} are colourless

B. Aq. solutions of Cu^{2+} and Zn^{2+} are colour less

C. Aqueous solutions of Fe^{3+} is green in colour

D. Aqueous solutions of MnO_4^- is colourless Magnetic properties

Answer: A

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Objective Exercise 2 Magnetic Properties

1. The magnetic moment of Cr^{3+} is similar to that of

A. Fe^{2+}

B. Fe^{3+}

C. Co^{3+}

D. Co^{2+}

Answer: D

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2. The atomic number of an element is 26. The magnetic moment exhibited by its ion in its $+2$ oxidation state is

A. 5.92 BM

B. 2.84 BM

C. 3.87 BM

D. 4.9 BM

Answer: D

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3. The pair of ions which do not have diamag netic nature

A. Cu^{1+} and Zn^{2+}

B. Sc^{3+} and Ti^{4+}

C. Ca^{2+} and Zn^{2+}

D. V^{2+} and Fe^{2+}

Answer: D

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4. The magnetic moment of an ion is $\sqrt{24}$ B.M. Then that ion may be

A. Mn^{2+}

B. Fe^{2+}

C. Fe^{3+}

D. Cu^{2+}

Answer: B

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5. M^{3+} ion of the first transition series metal 'M' has a magnetic moment 1.73 BM. The atomic number of the metal 'M' is

A. 21

B. 24

C. 29

D. 22

Answer: D

6. The value of paramagnetic moment of Ti^{3+} ion in Bohr magnetons is

A. 5.9

B. 1.73

C. 2.84

D. 3.87

Answer: B

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7. What is the correct order of spin only magnetic moment (in BM) of $Mn^{+2}, Cr^{\&}(+2)$ and V^{+2}?

A. $Mn^{+2} > V^{+2} > Cr^{+2}$

B. $V^{+2} > Cr^{+2} > Mn^{+2}$

C. $Mn^{+2} > Cr^{+2} > V^{+2}$

D. $Cr^{+2} > V^{+2} > Mn^{+2}$

Answer: C

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8. Spin only magnatic moment can be calculated by using $\mu = \sqrt{n(n+2)}$ where 'n' represents

A. Principal Quantum No.

B. Magnetic Quantum No.

C. Number of unpaired electrons

D. Spin Quantum No.

Answer: C

9. In which of the following 'd' subshells are degenerate

A. $Cu^{2+}_{(aq)}$

B. $Fe^{2+}_{(aq)}$

C. $Fe^{3+}_{(aq)}$

D. $Cu^{1+}_{(aq)}$

Answer: D

Watch Video Solution

Objective Exercise 2 Alloys

1. Transition elements form alloys easily because they have

A. same number of shells

B. same electronic configuration

C. nearly same atomic size

D. same atomic weight

Answer: C

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2. Alloys are generally prepare to modify the property

A) malleability

B) toughness

C) resistance to corrosion

A. A and B are correct

B. All are correct

C. B and C are correct

D. A and C are correct

Answer: D

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3. Which of the following is ferrous alloy?

A. German Silver

B. Gun metal

C. Nichrome

D. Devarda's alloy Permanganate and dichromate

Answer: C

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Objective Exercise 2 Permanganate And Dichromate

1. Potassium permanganate acts as an oxidant in neutral, alkaline as well as acidic media. The final products obtained from it in the three conditions are resectively

A. MnO_4^{2-}, Mn^{3+} and Mn^{2+}

B. MnO_2, MnO_2 and Mn^{2+}

C. MnO_2, MnO_2^+ and Mn^{3+}

D. MnO, MnO_2 and Mn^{2+}

Answer: B

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2. Number of electrons transferred in each case when $KMnO_4$ acts as an oxidising agent and converts into MnO_2, Mn^{2+}, $Mn(OH)_3$ and MnO_2^- are respectively

A. 3, 5, 4 and 1

B. 4, 3, 1 and 5

C. 1, 3, 4 and 5

D. 5, 4, 3 and 1

Answer: A

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3. $KMnO_4$ is powerful oxidant where it converts into

A. MnO_4^{2-}

B. MnO_2

C. Mn^{2+}

D. Mn^{3+}

Answer: B

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4. Four moles of $KMnO_4$ reacts with excess of hypo solution to produce - moles of Na_2SO_4

A. 3 moles

B. 1.5 moles

C. 6 moles

D. 2.0 moles

Answer: A

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5. An acidified solution of $KMnO_4$ oxidises

A. sulphates

B. sulphites

C. nitrates

D. ferric salts

Answer: B

Watch Video Solution

6. The equivalent weight of $MnSO_4$ is half of its molecular weight when it is converted to

A. Mn_2O_3

B. MnO_2

C. MnO_4^-

D. MnO_4^{2-}

Answer: B

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7. Which of the following oxides of chromium is amphoteric in nature

A. CrO

B. Cr_2O_3

C. CrO_3

D. CrO_5

Answer: B

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8. Incorrect statement regarding the structure of dichromate is

A. It has two kinds of bond lengths

B. $Cr - O - Cr$ Bond angle is 126°

C. It contains $p^{\pi} - d^{\pi}$ bonds between $Br\&O$

D. Each $'Cr'$ is surrounded by 3 oxygens

Answer: D

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9. Which compound of chromium is widely used in tanning of leather

A. $CrCl_3$

B. Cr_2O_3

C. CrO_2Cl_2

D. $K_2SO_4.Cr_2(SO_4)_3.24H_2O$

Answer: D

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Objective Exercise 2 Lanthanides And Actinides

1. Cerium (Z = 58) is an important member of lanthanoids. Which of the following statement

about cerium is incorrect 1)

A. The common oxidation states of cerium is $+3$ and $+4$

B. The $+3$ oxidation state of cerium is more stable than the $+4$ oxidation state

C. The $+4$ oxidation state of cerium is not known in solutions

D. Cerium (iv) acts as an oxidising agent

Answer: C

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2. Which of the following is a lanthanide element?

A. Ac

B. As

C. Nd

D. Pd

Answer: C

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3. The fact that can be explained based on lanthanide contraction is

A. Zr and Y have about the same radius

B. Zr and Nb have similar oxidation state

C. Zr and Hf have about same radius

D. Zr and Zn have the same oxidation state.

Answer: C

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4. Electronic configuration of divalent cation of Eu is

A. $4f^6$

B. $4f^7$

C. $5f^7$

D. $5f^8$

Answer: B

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5. Which of the following exhibits pink colour

A. Nd^{3+}

B. Sm^{3+}

C. Dy^{3+}

D. Ce^{4+}

Answer: A

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Practice Exercise

1. Which of the following element has high density

A. Sc

B. Zn

C. Cu

D. Co

Answer: C

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2. Element with pseudooctet configuration in its outermost shell

A. Copper

B. Palladium

C. God

D. Platinum

Answer: B

 Watch Video Solution

3. The atomic number of element having pseudo inert gas configuration in it's atomic state is

A. 46

B. 45

C. 47

D. 48

Answer: A

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4. Which of the following ion has three unpaired d-electrons

A. Ti^{2+}

B. V^{3+}

C. Cr^{3+}

D. Mn^{2+}

Answer: C

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5. Number of electrons present in the outer most shell of Cut ion

A. 0

B. 1

C. 8

D. 18

Answer: D

Watch Video Solution

6. Highest oxidation state exhibited by a 3d-metal is

A. $+2$

B. $+3$

C. $+7$

D. $+8$

Answer: C

Watch Video Solution

7. The highest oxidation state is exhibited by the transition metal with electronic configuration

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

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

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

D. $(n-1)d^6ns^2$

Answer: D

Watch Video Solution

8. Hydrated Cu^{2+} ions absorb light of ..... colour and transmit light of ..... colour

A. red and blue

B. green and purple

C. purple and red

D. blue and red

Answer: A

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9. The colour of $\left[Ti(H_2O)_6\right]^{3+}$ is due to

A. transfer of electron from one to another atom of titanium

B. presence of water molecules

C. d-d transition

D. intra molecular vibration

Answer: C

Watch Video Solution

10. Complementary colour of green light of wavelength $5000A^{\circ}$ is

A. purple

B. blue

C. red

D. grey

Answer: A

Watch Video Solution

11. A transitional metal X^{+2} in its hydrated state has six 3d electrons. The colour of ion is expected as

A. Green

B. Pink

C. Blue

D. Yellow

Answer: A

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12. Magnetic moment of which of the following is zero

A. Zn^{2+}

B. Cu^{2+}

C. Ni^{2+}

D. Cr^{2+}

Answer: A

Watch Video Solution

13. The magnetic moment of an ion in its $+3$ oxidation state is 3.85 BM. The number of unpaired d-electrons present in it are

A. 2

B. 3

C. 4

D. 5

Answer: B

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14. Common oxidation states of copper in its compounds are

A. $+1, +2$

B. $+1, +3$

C. $+2, +3$

D. $+2, +4$

Answer: A

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15. The ion with highest magnetic moment is

A. V^{3+}

B. Cr^{3+}

C. Fe^{3+}

D. Co^{3+}

Answer: C

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16. The highest degree of paramagnetism is shown by

A. $CoCl_2.\ H_2O$

B. $MnSO_4.4H_2O$

C. $FeCl_2.4H_2O$

D. $NiCl_2.6H_2O$

Answer: B

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17. M^{x+} ion has magnetic moment 2.84 BM. Then 'x' is (Z of M = 23)

A. 3

B. 2

C. 4

D. 1

Answer: A

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18. Magnetic moment of Mn^{+2} is 5.8 B.M. Hence the number of unpaired electrons presenting the metal ion is

A. 5

B. 4

C. 3

D. 2

Answer: A

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19. Reagent used to reduce NO_3^- to NH_3

A. Devarda's alloy

B. Permanganate

C. German silver

D. Aluminum bronze

Answer: A

Watch Video Solution

20. The common metal present in German Silver, Bell metal and Brass is

A. Fe

B. Cu

C. Zn

D. Sn

Answer: B

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21. The alloy containing highest percentage composition of copper is

A. German silver

B. Aluminium Bronze

C. Bell metal

D. Brass

Answer: B

Watch Video Solution

22. Which of the following is used for stressed structure castings

A. Invar

B. Nichrome

C. Duralmin

D. Devarda's alloy

Answer: C

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23. Zinc metal is not a constituent in the alloy

A. Brass

B. Bronze

C. Gun metal

D. Devarda's alloy

Answer: B

Watch Video Solution

24. Alloy used for making ball mills

A. γ - Alloy

B. Manganese steel

C. German silver

D. Bronze

Answer: B

 Watch Video Solution

25. Percentage of silver in the alloy of German silver

A. 1.5

B. 2.5

C. 10

D. zero

Answer: D

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26. Bearings are prepared using the alloy

A. Gun metal

B. Aluminium Bronze

C. Bell metal

D. German silver

Answer: A

27. Zn, Cd, Hg have lowest melting points in their respective periods. This can be explained based on

A. electrons used for bonding

B. charges present in nucleus

C. defects is crystal structures

D. conducting properties

Answer: A

28. Transition element which does not show variable oxidation state is

A. Sc

B. Zn

C. Cu

D. Fe

Answer: A

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29. More stable compound among the following is

A. VF_2

B. VF_3

C. VF_4

D. VF_5

Answer: D

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30. The element that forms oxide with highest oxidation state

A. Sc

B. V

C. Mn

D. Fe

Answer: C

31. As the oxidation state of metal in metal oxide increases its acidic nature

A. increases

B. decreases

C. remains unchange

D. First decreases and then increases

Answer: A

32. Highest oxidation state exhibited by a lanthanide element is

A. $+3$

B. $+4$

C. $+7$

D. $+8$

Answer: B

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33. Lanthanides are rare earths, but one of them is not available naturally. The element under consideration is

A. Dy

B. Eu

C. Nd

D. Pm

Answer: D

Watch Video Solution

34. The element with highest number of unpaired L electrons is

A. Gd

B. Ce

C. Sm

D. Eu

Answer: A

35. Colour exhibited by divalent Sm in aqueous solutions

A. dark blue

B. yellowish brown

C. blood red

D. greenish yellow

Answer: C

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36. Which of the following is paramagnetic ?

A. $V(CO)_6$

B. $Fe(CO)_5$

C. $Fe_2(CO)_9$

D. $Cr(CO)_6$

Answer: A

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37. 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

Watch Video Solution

38. Acidic oxide is formed by the metal and oxidation state of the metal in the oxide

A. $Mn, +6$

B. $Mn, +7$

C. $Cr, +3$

D. $Cr, +7$

Answer: A

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39. In the preparation of KMnO4, pyrolusite (MnO_2) is first converted to potassium magnate (K_2MnO_4). In this conversion, the oxidation state of manganese changes from

A. $+1$ to $+3$

B. $+2$ to $+4$

C. $+3$ to $+5$

D. $+4$ to $+6$

Answer: D

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40. Which of the following can be employed for the conversion of potassium manganate to potassium permanganate?

A) Ozone

B) Chlorine

C) Electrolysis

A. A, B

B. B, C

C. A, C

D. A, B, C

Answer: D

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41. The reaction $MnO_4^- + e^- \Leftrightarrow MnO_4^{2}$ takes place in

A. a basic medium

B. acidic medium

C. neutral medium

D. both acidic and basic medium

Answer: A

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42. When MnO_2 is fused with KOH in the presence of air, a coloured compound is formed, the product and its colour is

A. K_2MnO_4 and dark geen

B. $KMnO_4$ and purple

C. MnO_2O_3 and brown

D. MnO_2 and yellow

Answer: A

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43. Acidified potassium dichromate is treated with hydrogen sulphide. In the reaction 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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44. The equivalent mass of $K_2Cr_2O_7$ when it acts as oxidising agent in acidic medium, is equal to

A. M/3

B. M/2

C. M/6

D. M/5

Answer: C

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45. The aqueous solution containing which one of the following ion will be colourless ?

A. Sc^{3+}

B. Fe^{2+}

C. Ti^{3+}

D. Mn^{2+}

Answer: A

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46. Effective magnetic moment of Sc^{3+} ion is

A. 1.73

B. zero

C. 5.92

D. 2.83

Answer: B

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47. The stable oxiation state of Cu, Ag and Au are respectively

A. Cu^+, Ag^+, Au^+

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

C. Cu^+, Ag^+, Au^{3+}

D. Cu^{2+}, Ag^+, Au^{3+}

Answer: C

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48. Highest oxidation state exhibited by a lanthanide element is

A. $+3$

B. $+4$

C. $+7$

D. $+8$

Answer: B

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49. Larger number of oxidation states are exhibited by the actinoids than those by the lanthanoids. This can be best explained as

A. 4f orbitals more diffused than the 5f orbitals

B. Lesser energy difference between 5f and 6d than between 4f and 5d orbitals

C. More energy difference between 5f and 6d than between 4f and 5d orbitals

D. More reactive nature of the actinoids than the lanthanoids.

Answer: C

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

A. Zn acts as an oxidising agent when react with HNO_3

B. HNO_3 is weaker acid than H_2SO_4 and HCI

C. In electrochemical series Zn is above hydrogen

D. NO_3^- ion is reduced in perference to hydronium ion.

Answer: D

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