



CHEMISTRY

BOOKS - MARVEL CHEMISTRY (HINGLISH)

D AND F BLOCK ELEMENTS

Mcqs

1. Most of the d block elements are known as:

- A. Normal elements
- B. Inert elements
- C. Transition elements

D. Inner- transition elements

Answer: C



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2. The number of incomplete shells in transition elements are

A. 3

B. zero

C. 2

D. 1

Answer: C



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3. The number of transition series in the periodic table are

A. 4

B. 3

C. 5

D. 1

Answer: A



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4. The last electron which enters the atom of transition element is called

A. s - electron

B. p - electron

C. f- electron

D. d - electron

Answer: D



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5. Which among the following is not an element of the first transition series?

A. Zn

B. V

C. Ti

D. Ag

Answer: D



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6. The first transition element is _____.

A. Ac

B. Ti

C. Sc

D. Pt

Answer: C



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7. The first elements of first, second and third transition series respectively are

A. Zn, Cd, Hg

B. Sc, Y, La

C. Cu, Ag, Au

D. Cr, Mo, W

Answer: B



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8. An element with at. no. 27 belongs to which block of the periodic table?

A. s - block

B. p-block

C. d - block

D. f - block

Answer: C



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9. Which among the following is an element of the first transition series?

A. Ni

B. Au

C. Ag

D. Pt

Answer: A



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10. Which among the following ions contain maximum number of unpaired electrons ? (At. No. Cr = 24, Ni=28,

Sc=21 , Z=30)

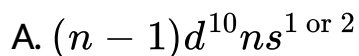


Answer: A



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11. What is the general electronic configuration of transition elements



B. $(n - 1)d^{1-10}ns^{1 \text{ or } 2}$

C. $(n - 1)d^{1-10}ns^0$

D. $(n - 1)d^{0-10}ns^2$

Answer: B



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12. The general electronic configuration of 3d series is ?

A. $[Ar]3d^{1-10}4s^{1 \text{ or } 2}$

B. $[Kr]3d^{1-10}4s^{1 \text{ or } 2}$

C. $[Ar]3d^{0-10}4s^{1 \text{ or } 2}$

D. $[Kr]3d^{0-10}4s^{1 \text{ or } 2}$

Answer: A



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13. Which among the following is a transition element?

A. Al

B. Cs

C. Pt

D. S

Answer: C



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14. Which one of the following constitutes a set of transition elements?

A. Sn,Bi, Mn

B. Fe,Au, Ni

C. Na,Mg, Al

D. Hg, Pb, Cu

Answer: B



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15. Manganese belongs to

A. 1st transition series

B. 2nd transition series

C. 3rd transition series

D. 4th transition series

Answer: A



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16. In the transition element the incoming electron occupies $[n - 1]$ d sublevel in preference to

A. $(n-1)s$ orbital

B. $(n - 1)p$ orbital

C. np orbital

D. ns orbital

Answer: C



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17. Zn^{+2} ion is isoelectronic with

A. Fe^{+2}

B. Cu^{+}

C. both a and b

D. Ni^{+2}

Answer: B



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18. The element with the electronic configuration

$[Xe]^{54}4f^{14}5d^16s^2$ is a

A. s - block

B. p - block

C. d - block

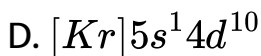
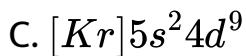
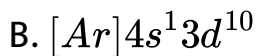
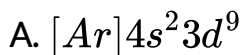
D. f - block

Answer: C



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19. The electronic configuration of copper is



Answer: B



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20. Which among the following forms coloured salts?

A. metals

B. non- metals

C. transition elements

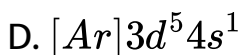
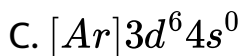
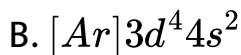
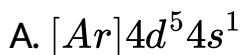
D. s - block elements

Answer: C



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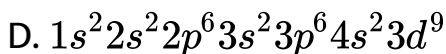
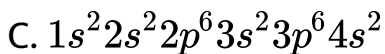
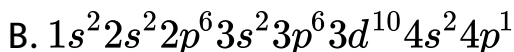
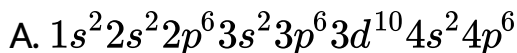
21. The correct ground state electronic configuration of chromium atom($Z=24$) is :



Answer: D

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



Answer: D

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23. The first transition element is _____.

A. Cr

B. Sc

C. Zn

D. Cu

Answer: B



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24. The 3d-series elements ranges

A. $Z = 21$ to 30

B. $Z = 22$ to 30

C. $Z = 20$ to 30

D. $Z = 31$ to 40

Answer: A



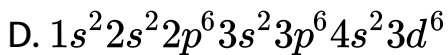
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25. Which of the following electron configurations is correct for iron, (atomic number 26)?

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

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

C. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^7$



Answer: D



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26. The valence shell of transition element consists of

A. n d orbitals

B. (n - 1) d orbitals

C. ns nd orbitals

D. (n - 1) d ns orbitals

Answer: D



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27. An atom has electronic configuration $1s^2 2s^2 2p^6 3s^2 3p^6 3d^3 4s^2$. In which group would it be placed ?

A. Group 5

B. Group 2

C. Group 3

D. Group 4

Answer: A



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28. The lightest transition element is

A. Hg

B. Sc

C. Fe

D. Ti

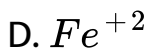
Answer: B



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29. Which of the following ion is colourless?

A. Fe^{+3}

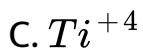


Answer: C



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30. Which ion will give colour in the aqueous solution ?

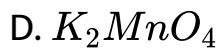
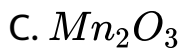


Answer: D



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31. The highest oxidation state of Mn is shown by



Answer: A



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32. Coloured ion among the following is



Answer: C



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33. Amongst Cu^{+1} , Fe^{+2} and Cr^{+3}

(At. No. $Cu = 29$, $Fe = 26$, $Cr = 24$)

A. Cu^{+1} is colourless, Fe^{+2} and Cr^{+3} are coloured

B. all are coloured

C. all are colourless

D. only Cr^{+3} is coloured, Cu^{+1} and Fe^{+2} are colourless

Answer: A



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34. Maximum oxidation state shown by Mn (At. no. 25) is

A. +7

B. +8

C. +6

D. +4

Answer: A



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35. Which of the following ion is coloured?

A. Sc^{+3}

B. Zn^{+2}

C. Cu^{+1}

D. Y^{+2}

Answer: D



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36. The colour of the transition metal ions is/are due to:

A. d - s transition

B. d - d transition

C. f - f transition

D. d - f transition

Answer: B



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37. The tendency to form complexes is maximum for

A. Normal elements

B. Transition elements

C. Inner transition elements

D. Metals containing completely filled d orbitals

Answer: B



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38. Transition elements have greater tendency to form complexes because

A. they contain partially filled d - orbitals

B. their charge/ size ratio is quite high

C. both a and b

D. they are metals and all metals form complexes

Answer: C



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39. The element showing most stable $+8$ oxidation state in its compounds is

A. Mn

B. Fe

C. Os

D. Sc

Answer: C

40. Which of the following transition metal show variable valency ?

A. Sc

B. Fe

C. Ac

D. Zn

Answer: B

41. The maximum oxidation state of transition metals are obtained by the following:

- A. ns electrons
- B. $(n - 1) d$ - electrons
- C. $ns + (n - 1) d$ - electrons
- D. $(n + 1) d$ - electrons

Answer: C



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42. The most abundant transition metal in earth crust is :

- A. Fe

B. Cu

C. Zn

D. Ag

Answer: A



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43. Most stable oxidation state of iron is

A. +1

B. +4

C. +3

D. +5

Answer: C



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44. Transition elements are coloured

- A. small size
- B. metallic nature
- C. unpaired d - electron
- D. reflection of light

Answer: C



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45. Which one of the following properties is not a transition elements

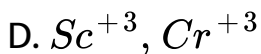
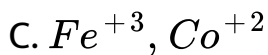
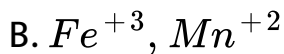
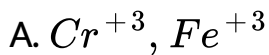
- A. colour
- B. catalytic activity
- C. fixed valency
- D. paramagnetism

Answer: C



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



Answer: B



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47. Transitional elements exhibit variable valencies because they release electrons from the following orbits

A. ns

B. ns and np

C. $(n - 1)d$

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

Answer: D



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48. Which of the following ions has the maximum number of unpaired d- electrons ?

A. Fe^{+3}

B. Fe^{+2}

C. Co^{+2}

D. Co^{+3}

Answer: A



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49. The colour of transition metal ion is attributed to:

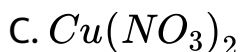
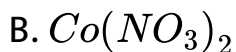
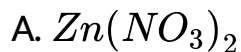
- A. small size metal ions
- B. absorption of light in visible region
- C. incomplete $(n - 1)$ d subshell
- D. both b and c

Answer: D



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50. The aqueous solution of the following salts will be coloured in the case of



D. both b and c

Answer: D



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51. The number of unpaired electrons in ferrous ion is

A. 4

B. 2

C. 3

D. 0

Answer: A



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52. The first and last element of the second transition series respectively are

A. Y, Cd

B. La, Hg

C. Cd, Y

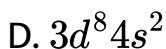
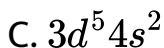
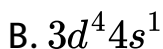
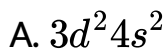
D. Y, Hg

Answer: A



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53. Among the following outermost configurations of transition metals, which shows the highest oxidation state



Answer: C



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54. Transition metals:

- A. show diamagnetism
- B. show catenation
- C. do not form alloy
- D. show variable oxidation states

Answer: D



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55. The transition elements are more metallic than p - block elements because they have

- A. electrons in d - orbitals
- B. electron pairs in d- orbitals
- C. availability of d - electrons for bonding
- D. high ionisation energy

Answer: C



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56. The number of unpaired electron in Ni^{2+} is

- A. Zero

B. 2

C. 4

D. 8

Answer: B



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

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

B. all three are coloured

C. all three are colourless

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

Answer: A



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58. Zinc does not show variable valency Because of:

A. completed subshell

B. incompleted subshell

C. $4s^2$ sub shell

D. they belong to 4th period

Answer: A



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59. Common oxidation state of Scandium, a transition element is /are (At. No =21)

A. +4

B. +1

C. +2 and +3

D. +4 and +1

Answer: C



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60. Oxidation number of osmium (Os) in OsO_4 is

A. 4

B. 6

C. 7

D. 8

Answer: D



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61. Cuprous ion is colourless, while cupric ion is colored because

A. both have half filled p - and d - orbitals

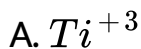
- B. cuprous ion has incomplete d - orbital and cupric ion has completed d - orbitals
- C. both have unpaired electrons in d-orbitals
- D. cuprous ion has a completed d - orbital and cupric ion has an incomplete d - orbitals

Answer: D



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62. Which ion is colourless in water ?





Answer: B



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63. Zn and Hg do not show variable valency like d – block elements because-

A. they are soft

B. their d - sub shells are complete

C. they have only two electrons in the outermost shell

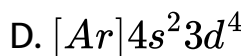
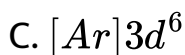
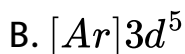
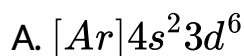
D. their d - sub shells are in complete

Answer: B



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64. Which of the following is the stable electron configuration of Fe^{+3} ion



Answer: B



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65. Which group contains coloured ions out of (1) Cu^{+2}
(2) Ti^{+2} , (3) Co^{+2} , (4) Fe^{+2}

A. 1, 2, 3, 4

B. 1, 3, 4

C. 2, 3, 4

D. 1, 2, 3

Answer: B



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

- A. their chemical reactivity
- B. their unfilled d - orbitals
- C. their ability to adopt multiple oxidation states and their complexing ability
- D. less metallic character

Answer: C



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67. Which one of the following characteristics of transition metals is associated with their catalytic activity?

- A. high heat of atomisation

- B. paramagnetic behavior
- C. colour of hydrated ions
- D. variable oxidation states

Answer: D



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68. Most stable oxidation state of iron is

- A. + 1
- B. + 3
- C. - 2
- D. - 3

Answer: B



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69. Which one of the following transition metal ions is diamagnetic?



Answer: D



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70. In a transition series, as the atomic number increases, paramagnetism

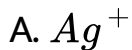
- A. increases gradually
- B. decreases gradually
- C. first increases to maximum and then decreases
- D. first decreases to minimum and then increases

Answer: C



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71. Which one of the following transition metal ions is paramagnetic?

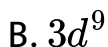


Answer: B



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72. The lowest magnetic moment is shown by the transition metal ion with the configuration



C. $3d^2$

D. $3d^3$

Answer: B



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73. The highest magnetic moments is shown by the transition metal ion with the outermost electronic configuration is:

A. $3d^2$

B. $3d^5$

C. $3d^7$

D. $3d^9$

Answer: B



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74. Which one of the following has the least magnetic moment ?



Answer: A



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75. Which of the following is a diamagnetic ion?



Answer: D



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76. One of the following is diamagnetic



B. Cu^{+}

C. Cu^{2+}

D. All the above

Answer: B



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77. 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 elements form paramagnetic ions

A. all the d and f block elements are metals

B. all the d and f block elements form coloured ions

C. all the d and f block elements form paramagnetic ions

D. (a) and (b) both

Answer: A

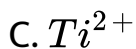


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78. Which of the following ions has maximum magnetic moment ? ·

A. Cu^{2+}

B. Mn^{2+}



Answer: B



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79. In the Cr^{+2} , Mn^{+3} , Fe^{+2} and CO^{+3} ions, number of unpaired electrons and magnetic moment will be

A. 3, 3.87

B. 4, 4.90

C. 3, 2.83

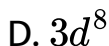
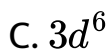
D. 1, 1.73

Answer: B



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80. The symbolic configuration of few transition ions are given below. Choose the ion which shows minimum magnetic moment.



Answer: A



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81. The value of magnetic moment for $[Co(NH_3)_6]^{3+}$ is zero, the unpaired electron would be

A. 0

B. 1

C. 2

D. 3

Answer: A



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82. Amongst the ion of 3d transition series paramagnetic character increases from Ti^{2+} to



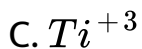
Answer: B



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83. Diamagnetic ion is





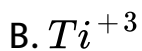
D. None of these

Answer: D



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84. Paramagnetic ion is



Answer: B



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85. Cations with all the paired electrons will have the total magnetic moment of

A. 1.54

B. 2.83

C. zero

D. 5.92

Answer: C



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86. Fe^{3+} is paramagnetic

- A. three unpaired electrons
- B. five unpaired electrons
- C. four unpaired electrons
- D. none of the above

Answer: C



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87. Diamagnetism is the property of

- A. non-transitional elements

- B. unpaired electrons
- C. completely filled electronic sub-shells
- D. half filled degenerate orbitals

Answer: C



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88. Which of the following statements is not true in regard to transition elements

- A. Show variable valency
- B. Paramagnetic in nature
- C. does not impart colour to flame

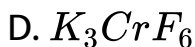
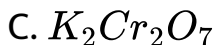
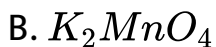
D. Act as catalytic agent

Answer: C



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89. Maximum paramagnetic character would be shown by



Answer: D



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90. Paramagnetic substance on placing in the magnetic field in Guoy's experiment

- A. its weight decreases
- B. its weight becomes half
- C. its weight increases
- D. no change in its weight

Answer: C



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91. Diamagnetic character arises from

- A. spinning motion of paired electrons
- B. spinning motion of unpaired electrons
- C. orbital motion of electrons
- D. spinning motion of protons

Answer: A



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92. Cu^{+} and Cu^{+2} are

- A. Paramagnetic
- B. Diamagnetic
- C. Diamagnetic and paramagnetic

D. Paramagnetic and diamagnetic respectively

Answer: C



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93. Even after removal of magnetic field substance does not cease to exhibit magnetic character, the phenomenon is

A. Diamagnetism

B. Paramagnetism

C. Ferromagnetism

D. Ferro-electroism

Answer: C



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94. The "spin-only" magnetic moment [in units of Bohr magneton, (μ_B)] of Ni^{2+} in aqueous solution would be :
(At no. $Ni = 28$).

A. 3.84

B. 2.84

C. 8.24

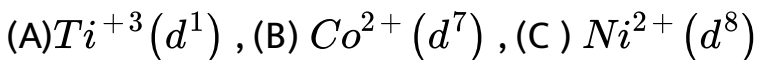
D. None of the above

Answer: B



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95. The electronic configuration of few transition metal ions are as under



Increasing order of paramagnetic character is

A. A,C,B

B. B,C,A

C. A,B,C

D. C,B,A

Answer: A



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96. The atomic radii of transition elements in a period are.

A. smaller than those of s-block as well as p-block elements

B. greater than those of p-block as well as s-block elements

C. smaller than those of s-block but greater than those of p-block elements

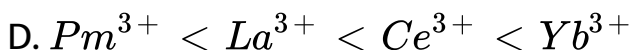
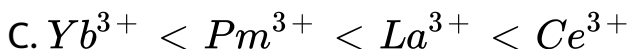
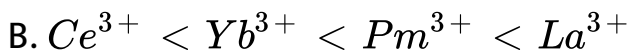
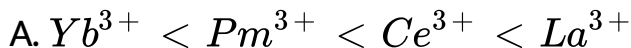
D. greater than those of s-block but smaller than those of p-block elements

Answer: C



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97. Arrange Ce^{3+} , La^{3+} , Pm^{3+} and Yb^{3+} in increasing order of their size -



Answer: A



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98. Maximum radius will be of __ ions.





Answer: D



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99. The atomic radius of Zn is __ than that of Cu.

A. less

B. greater

C. equal

D. none

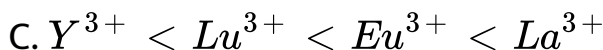
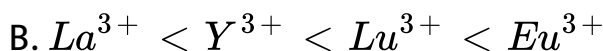
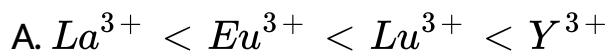
Answer: B



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100. 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*)



Answer: C



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101. Which one of the following atoms is not involved in the formation of interstitial compounds?

- A. Hydrogen
- B. Carbon
- C. Nitrogen
- D. Iodine

Answer: D



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102. which forms interstitial compounds?

A. Fe

B. Co

C. Ni

D. All

Answer: D



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103. Formation of interstitial compound makes the transition metal

A. more soft

B. more ductile

C. more metallic

D. more hard

Answer: D



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104. Transition metals, when they form interstitial compounds, the non-metals (H,B,C,N) are accommodated in:

A. the empty spaces between atoms

B. the vacant orbitals

C. some in vacant orbitals and some in empty spaces

D. none of the above is true

Answer: A



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105. Alloy is an example of

A. Gel

B. Aerosol

C. Solid solution

D. Emulsion

Answer: C



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106. Percentage of silver in German silver is

A. 1.5 %

B. 5 %

C. 10 %

D. zero%

Answer: D



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107. Steel contains

A. Fe+C + Mn

B. Fe+ C+Ni

C. Fe+ Mn

D. Fe+ Mn +Cr

Answer: A



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108. Bell metal is an alloy of

A. Cu, Zn and Sn

B. Cu and Sn

C. Cu and Zn

D. Sn and Zn

Answer: B



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109. Which of the following group of transition metals is called coinage metals?

A. Ag, Cu, Ni

B. Zn, Ag, Au

C. Ag, Fe, Cu

D. Cu, Ag, Au

Answer: A



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110. Coinage metals show the properties of:

- A. Typical elements
- B. Normal elements
- C. Transition elements
- D. Coin elements

Answer: C



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111. Solder is an alloy of :

- A. Cu, Ag, Zn

B. Cd, Ag, Zn

C. Ni, Ag, Zn

D. Cd, Zn, Ni

Answer: A



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112. Explain:

(a). Why is $K_2Cr_2O_7$ generally preferred to $Na_2Cr_2O_7$ in volumetric analysis?

(b). Which divalent metal ion has maximum paramagnetic character among the first transition metals? Why?

(c). How the colour of $K_2Cr_2O_7$ solution does depend on pH of the solution?

- A. $\text{Na}_2\text{Cr}_2\text{O}_7$ is hygroscopic while $\text{K}_2\text{Cr}_2\text{O}_7$ is not
- B. $\text{K}_2\text{Cr}_2\text{O}_7$ is hygroscopic while $\text{Na}_2\text{Cr}_2\text{O}_7$ is not
- C. $\text{K}_2\text{Cr}_2\text{O}_7$ is pure and $\text{Na}_2\text{Cr}_2\text{O}_7$ is impure
- D. None of the above

Answer: A



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113. Mixture of $\text{K}_2\text{Cr}_2\text{O}_7$ and conc. H_2SO_4 is called

- A. Perchromic acid
- B. Chromic acid
- C. Chromium sulphate

D. None of these

Answer: B



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114. The oxidation state of Cr in $K_2Cr_2O_7$ is:

A. +5

B. +3

C. +6

D. +7

Answer: C



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115. Which of the following statement is false?

- A. An acidified solution of Cr_2O_3 liberates iodine from potassium iodide
- B. In acidic solution, dichromate ions are converted to chromate ions
- C. Ammonium dichromate on heating undergoes exothermic decomposition to give Cr_2O_3
- D. Potassium dichromate is used as a titrant for Fe^{2+} ions

Answer: B



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116. Which of the following compounds is used as the starting material for the preparation of potassium dichromate?

A. $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$ (chrome alum)

B. $PbCrO_4$ (chromate yellow)

C. $FeCr_2O_4$ (chromite)

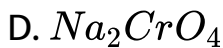
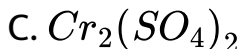
D. $PbCrO_4 \cdot PbO$ (chrome red)

Answer: C



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117. Which of the following statements is/are correct, when a mixture of $NaCl$ and $K_2Cr_2O_7$ is gently warmed with concentrated H_2SO_4 ?



Answer: A



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118. When SO_2 is passed through acidified $K_2Cr_2O_7$ solution

- A. the solution turns blue
- B. the solution is discoloured
- C. SO_2 is reduced
- D. green $Cr_2(SO_4)_3$ is formed

Answer: D



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119. In the standardization of $Na_2S_2O_3$ using $K_2Cr_2O_7$ by iodometry, the equivalent weight of $K_2Cr_2O_7$ is

A. $\frac{\text{Molecular weight}}{2}$

B. $\frac{\text{Molecular weight}}{6}$

C. $\frac{\text{Molecular weight}}{3}$

D. same as the molecular weight

Answer: B



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120. When acidified solution of $K_2Cr_2O_7$ is shaken with aqueous solution of $FeSO_4$, Then:

A. $Cr_2O_7^{2-}$ ion is reduced to Cr^{3+} ion

B. $Cr_2O_7^{2-}$ ion is converted by $Cr_2O_4^{2-}$ ions

C. $Cr_2O_7^{2-}$ ion is oxidised to Cr

D. $Cr_2O_7^{2-}$ ion is oxidised to CrO_3

Answer: A



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121. When sulphur dioxide gas is passed through acidified potassium dichromate solution, the colour of the solution changes from:

A. orange to blue

B. orange to green

C. green to orange

D. orange to colourless

Answer: B



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122. The mineral from which potassium permanganate is manufactured is

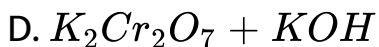
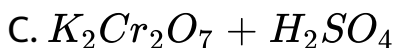
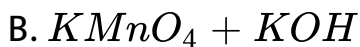
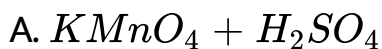
- A. Pyrolusite, MnO_2
- B. Braunite, Mn_2O_3
- C. Hausmannite Mn_3O_4
- D. Manganite, $Mn_2O_3 \cdot H_2O$

Answer: A



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123. Baeyer's reagent is

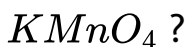


Answer: B



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124. Which one of the following is not oxidized by acidified



A. Sodium oxalate

B. Potassium iodide

C. Ferrous sulphate

D. Sodium sulphate

Answer: D



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125. An acidified solution of potassium permanganate oxidizes

A. sulphates

B. sulphites

C. nitrates

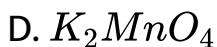
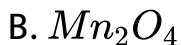
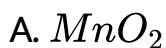
D. ferric salts

Answer: B



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126. Manganese achieves its highest oxidation state in its compound



Answer: C

127. Potassium manganate (K_2MnO_4) is formed when

- A. chlorine is passed in to aqueous $KMnO_4$
- B. manganese dioxide is fused with potassium hydroxide in air
- C. formaldehyde reacts with potassium permanganate in presence of a strong alkali
- D. potassium permanganate reacts with concentrated sulphuric acid

Answer: B

128. Which one of the following compounds does not decolourise an acidified aqueous solution of $KMnO_4$

- A. Sulphur dioxide
- B. Ferric chloride
- C. Hydrogen peroxide
- D. Ferrous sulphate

Answer: B



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129. The starting material for the manufacture of $KMnO_4$ is

- A. Pyrolusite
- B. Manganite
- C. Magnetite
- D. Haemalite

Answer: A



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130. When $KMnO_4$ is reduced with oxalic acid in acidic solution, the oxidation number of Mn changes from

A. 4 to 2

B. 6 to 4

C. +7 to +2

D. 7 to 4

Answer: C



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131. In the preparation of $KMnO_4$, Pyrolusite (MnO_2) is first converted to potassium manganate (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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132. The equivalent weight of $KMnO_4$ in (a) neutral medium, (b) acidic medium and (c) alkaline medium is $M / . .$ (where M is mol.wt. of $KMnO_4$)

A. 158.0

B. 79.0

C. 52.7

D. 31.6

Answer: D



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133. Assertion : $KMnO_4$ acts as an oxidising agent in acidic, basic or neutral medium.

$KMnO_4$ oxidises ferrous sulphate to ferric sulphate.

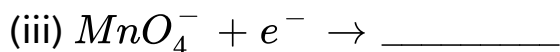
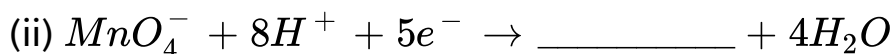
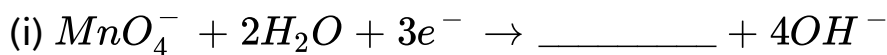
- A. acidic medium only
- B. neutral and acidic media
- C. neutral and alkaline media
- D. neutral , acidic and alkaline media

Answer: D



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134. Complete the following reactions.



A. a basic medium

B. an acid medium

C. a neutral medium

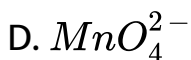
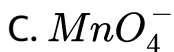
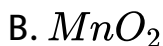
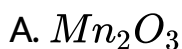
D. both acidic and basic media

Answer: A



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



Answer: B



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136. Assertion: $KMnO_4$ is purple in colour due to charge transfer .

Reason :There is no electron present in d-orbitals of maganese in MnO_4^-)

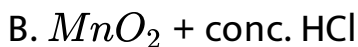
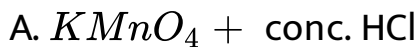
- A. d - d transition
- B. charge transfer transition
- C. f- f transition
- D. d - f transition

Answer: A



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137. Formation of Cl_2 gas is not possible in the reaction



Answer: D



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138. Which transition metal is different among the following ?



B. Hg

C. Mn

D. Cr

Answer: B



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139. Which one of the following metal will not form amalgam ?

A. Gold

B. Zinc

C. Mercury

D. Tin

Answer: C



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140. The triad consisting of ferrous metals is

A. Fe, Ni, Mn

B. Fe, Cu, Ag

C. Fe, Co, Ni

D. Fe, Ni, Ag

Answer: C



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141. The noble character of platinum and gold is favoured by

- A. they were discovered by Alfred Nobel
- B. they have shining surface and are used for noble work like making ornaments
- C. they are found in native state
- D. they almost do not react with other chemicals

Answer: D



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142. Which of the following group of transition metals is called coinage metals?

A. *Fe, Co, Ni*

B. *Pt, Au, Ag*

C. *Cu, Ag, Au*

D. *Pt, Ir, Pd*

Answer: C



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143. Which of the sulphide given below is not black in colour?

A. NiS

B. CuS

C. CoS

D. CdS

Answer: D



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144. Fe^{+3}

A. is isoelectronic with Cu^{+2}

B. is isoelectronic with Co^{+2}

C. is isoelectronic with Mn^{+2}

D. is isoelectronic with Ni^{+2}

Answer: C



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145. Which of the following is present in haemoglobin'?

A. Fe

B. Au

C. Pb

D. Cd

Answer: A



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146. 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 elements form paramagnetic ions

A. (i) and (ii)

B. (ii) and (iii)

C. (i) only

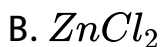
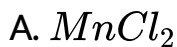
D. (iii) only

Answer: C



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147. Which of the following is diamagnetic in nature ?



Answer: B



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148. Zinc dust is obtained by

A. Grinding Zinc metal

- B. Melting Zinc and then atomising it with a blast of air
- C. Burning Zinc metal in air
- D. Reducing its ore

Answer: B



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149. Zinc is used to protect corrosion of iron because

- A. ZnS
- B. ZnO
- C. $\text{Zn}(\text{OH})_2$
- D. $\text{ZnCO}_3 \cdot \text{Zn}(\text{OH})_2$

Answer: D



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150. Out of the following sulphides, which one is soluble in dil. HCl ?

A. CuS

B. PbS

C. HgS

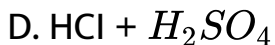
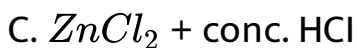
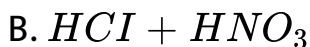
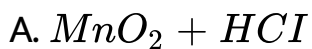
D. ZnS

Answer: C



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151. Lucas reagent is ,

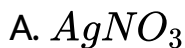


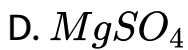
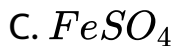
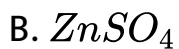
Answer: C



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152. Copper displaces Which of the metal from their salt solutions?





Answer: A



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153. Which of the following ions is not amphoteric?



Answer: D



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154. The metals present in insulin and haemoglobin are respectively:

A. Fe

B. Co

C. Zn

D. Au

Answer: C



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155. Transition metals are often paramagnetic due to

- A. high m.p. and b.p.
- B. presence of unpaired electrons
- C. malleability and ductility
- D. low m.p. and b.p.

Answer: B



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156. The transition metals mostly are

- A. Diamagnetic

B. Paramagnetic

C. neither diamagnetic nor paramagnetic

D. both diamagnetic and paramagnetic

Answer: B



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

A. Ag, Au, Pt

B. Fe, Co, Ni

C. Zn, Cd, Hg

D. Sc, Y, Ac

Answer: C



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158. The outer electronic configuration of Ag is $4d^{10}5s^1$, it belongs to

- A. 5th period, group 4
- B. 4th period, group 5
- C. 5th period, group 11
- D. 4th period, group 11

Answer: C



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159. Which of the following statement is correct?

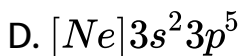
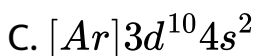
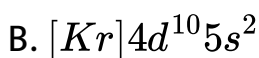
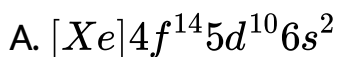
- A. Iron belongs to same transition series as silver
- B. Iron belongs to third transition series in the periodic table
- C. Iron belongs to first transition series
- D. Iron belongs to 5d series

Answer: C



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160. The electronic configuration of four elements are given below. Which element does not belong to the same family as others ?



Answer: D



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161. In the ground state, an element has 13 electrons in its 'M' shell. The element is

A. Cu

B. Cr

C. Ni

D. Fe

Answer: B



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162. In the ground state configuration of Mn, how many electrons are present in 'N' shell ?

A. 13

B. 2

C. 15

D. 3

Answer: B

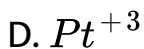
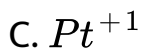


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163. Ag^{+} ion is isoelectronic with which of the following ion?

A. Cd^{+2}

B. Au^{+3}

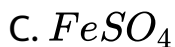
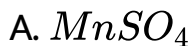


Answer: A



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164. Which of the following contains the maximum number of unpaired electrons ?



Answer: A



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165. Which of the following transition metal cation has maximum unpaired electrons?



Answer: A



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166. The purple colour of $[Ti(H_2O)_6]^{+3}$ ion is due to

- A. unpaired d- electron
- B. transfer of an electron
- C. presence of water molecules
- D. reflection of light

Answer: A



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167. Transition metal usually exhibit highest oxidation states in their

- A. Chlorides

B. Hydrides

C. Fluorides

D. Iodides

Answer: C



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168. The number of d-electrons retained in Fe^{2+} (At. no. of Fe = 26) ions is

A. 4

B. 5

C. 6

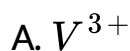
D. 3

Answer: C



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

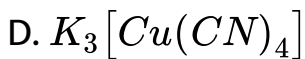
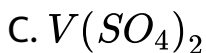
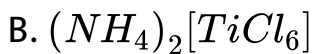
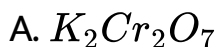


Answer: C



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170. Compound that is both paramagnetic and coloured is:

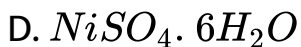
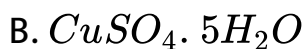


Answer: C



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171. Amongst the following, the lowest degree of paramagnetism per mole of the compound at $298K$ will be shown by

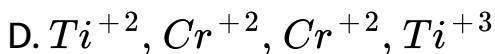
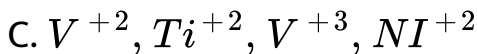
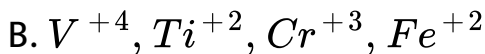
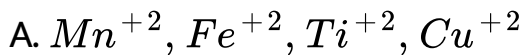


Answer: B



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172. The increasing order of magnetic moment will be



Answer: B



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173. Faulty statement for paramagnetic ion is

A. paramagnetic ions are coloured

B. paramagnetic ions are colourless

C. paramagnetic ions contain unpaired electrons

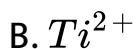
D. paramagnetic ions do not show zero magnetic moment

Answer: B



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174. Out of Fe^{2+} , Fe^{3+} , Mn^{2+} and Ti^{2+} the least size is of



Answer: D



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175. The equilibrium

$Cr_2O_7^{2-} \rightleftharpoons 2CrO_4^{2-}$ is shifted to right in-

A. an acidic medium

B. a basic medium

C. a neutral medium

D. it does not exist

Answer: B



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176. In the dichromate dianion,

- A. 4Cr - O bonds are equivalent
- B. 6Cr - O bonds are equivalent
- C. all Cr-O bonds are equivalent
- D. all Cr-O bonds are non-equivalent

Answer: B



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

- A. $\frac{1}{3}$

B. 3

C. $\frac{1}{6}$

D. 6

Answer: A



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178. One of the products formed due to the reaction between $KMnO_4$ and HCl is

A. Red liquid

B. MnO_2

C. Greenish yellow gas

D. HClO_4

Answer: C



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179. The equivalent weight of KMnO_4 (formula weight M)

when it is used as an oxidant in neutral medium is

A. M

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

C. $\frac{M}{3}$

D. $\frac{M}{5}$

Answer: C



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180. When MnO_2 is fused with KOH , a coloured compound is formed. The product and its colour is

A. K_2MnO_4 (purple green)

B. $KMnO_4$ (purple)

C. Mn_2O_3 (brown)

D. Mn_2O_4 (black)

Answer: A



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181. How many moles of acidified $FeSO_4$ solution can be completely oxidised by one mole of $KMnO_4$?

A. 10

B. 5

C. 6

D. 2

Answer: B



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182. The equivalent weight of potassium permanganate in acid solution is

- A. $\frac{1}{5}$ of its molecular weight
- B. $\frac{1}{6}$ of its molecular weight
- C. $\frac{1}{10}$ of its molecular weight
- D. $\frac{1}{2}$ of its molecular weight

Answer: A



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183. In strongly alkaline medium, the equivalent mass of $KMnO_4$ is -----, where M is formula mass.

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

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

C. $\frac{M}{6}$

D. M

Answer: A



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

A. $\frac{2}{3}$ mole of MnO_4^{2-} and $\frac{1}{3}$ mole of MnO_2

B. $\frac{1}{3}$ mole of MnO_4^{2-} and $\frac{2}{3}$ mole of MnO_2

C. $\frac{2}{3}$ moles of Mn_2O_7 and $\frac{2}{3}$ mole of MnO_2

D. $\frac{1}{3}$ moles of Mn_2O_7 and $\frac{1}{3}$ mole of MnO_2

Answer: A



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185. Which of the following pairs will not produce dihydrogen gas ?

- A. Na and alcohol
- B. Mg and steam
- C. Cu and HCl
- D. K and acetic acid

Answer: C



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186. In Cu (At. no. = 29)

- A. 13 electrons have spin in one direction and 16 electrons in other direction
- B. 14 electrons have spin in one direction and 15 electrons in other direction
- C. all the electrons have spin in one direction
- D. All the electron have spin in different direction

Answer: B



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187. Among (i) $FeSO_4 \cdot 7H_2O$, (ii) $CuSO_4 \cdot 5H_2O$, (iii) $ZnSO_4 \cdot 7H_2O$ and (iv) $MnSO_4 \cdot 4H_2O$, isomorphous salts are

A. A and C

B. A and D

C. B and C

D. A and B

Answer: A



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188. In modern periodic table, by which name d-block elements are known ?

- A. More electropositive element is
- B. Less electropositive elements
- C. Transition elements
- D. Inner transition elements

Answer: C



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189. Which of the following does not considered as transition element ?

A. Au

B. Hg

C. La

D. Pt

Answer: B



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190. Which elements have low ionisation enthalpy as compare to their neighbour element in first transition series?

A. Cr, Cu

B. Cr, Zn

C. Cr, Mn

D. Cu, Zn

Answer: A



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191. Match the following:

Column A	Column B
(1) V^{4+}	(a) Colourless
(2) Ti^{3+}	(b) Pink
(3) Ti^{4+}	(c) Purple
(4) Mn^{2+}	(d) Violet

A. 1-(d), 2-(c) , 3-(a) , 4-(b)

B. 1-(d) , 2-(b) , 3-(a) , 4-(c)

C. 1-(d) , 2- (a) , 3-(c) , 4-(b)

D. 1-(a) , 2-(c) , 3-(b) , 4-(d)

Answer: A



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192. Which of the following sentences is not suitable for the capacity of transition metal to form complex compounds ?

A. Transition metal ions are small in size

B. Nuclear charge of transition metal ion is comparatively more

C. Co-ordination covalent bond is not directional

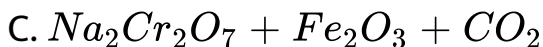
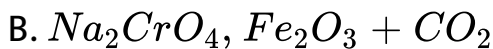
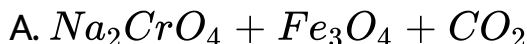
D. Transition metal ions possesses different oxidation states

Answer: C



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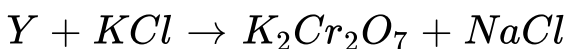
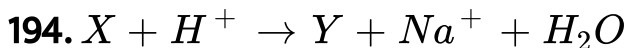
193. $FeCr_2O_4 + Na_2CO_3 + O_2 \rightarrow$ mention which product is obtained?



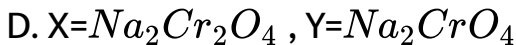
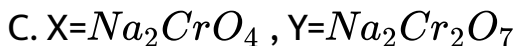
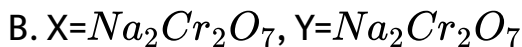
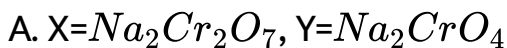
Answer: B



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Mention X and Y.



Answer: C



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195.



What will be mole ratio of products in above reaction ?

A. 1:1:1:1

B. 1:2:2:1

C. 1:1:2:2

D. 2:2:1:2

Answer: D



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196. What would be energy order of d-orbitals of tetrahedral complexes when they undergo splitting ?

A. $d_{xy} \cong d_{y^2} \cong d_{xz} < d_{x^2-y^2} \cong d_z^2$

B. $d_{x^2-y^2} \cong d_z^2 < d_{xy} \cong d_{yz} \cong d_{xz}$

C. $d_{xy} \cong d_z^2 < d_{yz} \cong d_{xz} \cong d_{x^2-y^2}$

D. $d_{x^2-y^2} \cong d_{xz} < d_{xy} \cong d_{yz} \cong d_z^2$

Answer: B



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197. Which of the following pair of elements has $(n-1)d^{10}ns^2$ electronic configuration ?

A. Fe, Co, Ni

B. Cu, Ag, Au

C. Zn, Cd, Hg

D. Sc, Y, La

Answer: C



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198. When MnO_2 is fused with KOH , a coloured compound is formed, the product and its colour is:

A. K_2MnO_4 , Dark green

B. $KMnO_4$, Violet

C. Mn_2O_3 , Grey

D. Mn_2O_4 , Black

Answer: A



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199. Which of the following is use of potassium dichromate ?

A. To oxidise ferrous ions into ferric ions in acidic medium as an oxidising agent

B. As an insecticide

C. In electroplating

D. As a reducing agent

Answer: A



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200. The number of d-electrons retained in Fe^{2+} (At. no. of Fe = 26) ions is

A. 4

B. 5

C. 6

D. 3

Answer: C

201. Of the following outer electronic configurations for atoms the highest oxidation state is achieved by which one of them :

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

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

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

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

Answer: B

202. One of the constituents of German silver is

A. Ag

B. Cu

C. Mg

D. Al

Answer: B



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203. How many unpaired electrons are present in Ni^{2+} ?

A. 0

B. 2

C. 4

D. 8

Answer: B



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204. Iron is rendered passive by treatment with concentrated

A. H_2SO_4

B. H_3PO_4

C. HCl

D. HNO_3

Answer: D



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205. Zinc-copper couple that can be used as a reducing agent is obtained by

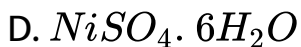
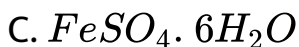
- A. mixing zinc dust and copper gauze
- B. zinc coated with copper
- C. copper coated with zinc
- D. zinc and copper wires welded together

Answer: B



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206. Amongst the following, the lowest degree of paramagnetism per mole of the compound at $298K$ will be shown by



Answer: B



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207. Which one is solder ?

A. Cu and Pb

B. Zn and Cu

C. Pb and Sn

D. Fe and Zn

Answer: C



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208. Which compound does not dissolve in hot diluted HNO_3 ?

A. HgS

B. PbS

C. CuS

D. CdS

Answer: A



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

A. Cr_2O_3

B. Cr_2O_3

C. Cr

D. $CrO(O_2)$

Answer: B



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210. The number of moles of $KMnO_4$ that will be needed to react with one mole of sulphite ion in acidic solution is

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

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

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

D. 1

Answer: A



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211. In the dichromate dianion,

- A. 4 Cr - O bonds are equivalent
- B. 6 Cr - O bonds are equivalent
- C. all Cr - O bonds are equivalent
- D. all Cr - O bonds are nonequivalent

Answer: B



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212. When MnO_2 is fused with KOH , a coloured compound is formed, the product and its colour is:

- A. K_2MnO_4 , purple green

B. K_2MnO_4 , purple

C. Mn_2O_3 , brown

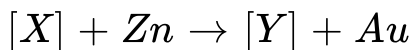
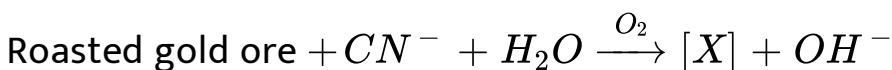
D. Mn_3O_4 , black

Answer: A

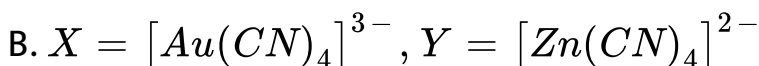
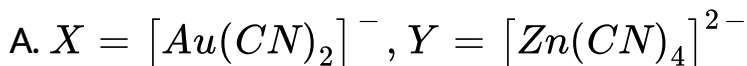


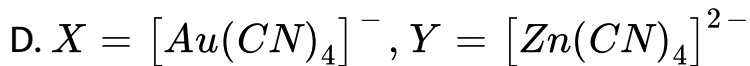
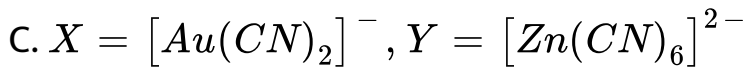
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213. In the process of extraction of gold.



Identify the complexes $[\text{X}]$ and $[\text{Y}]$.





Answer: A



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

A. $\sqrt{3}$

B. $\sqrt{8}$

C. $\sqrt{15}$

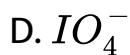
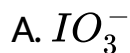
D. $\sqrt{24}$

Answer: C



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

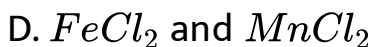
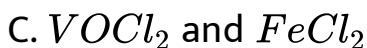
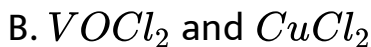
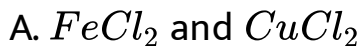


Answer: A



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216. Which pair of compounds is expected to show similar colour in aqueous medium?

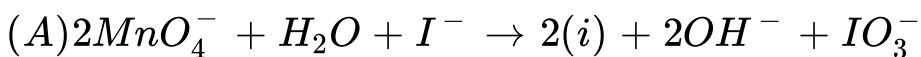


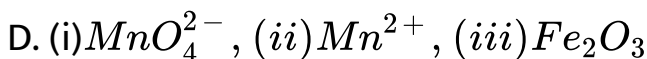
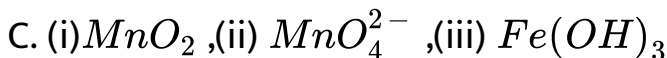
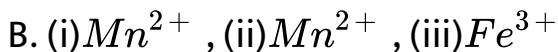
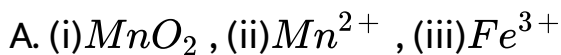
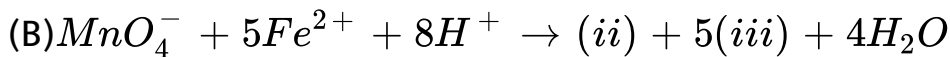
Answer: B



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217. Complete the given reactions :





Answer: A



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218. $KMnO_4$ acts as an oxidising agent in acidic medium.

The number of moles of $KMnO_4$ that will be needed to react with one mole of sulphide ions in acidic solution is

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

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

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

D. $\frac{1}{5}$

Answer: A



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219. When an oxide of manganese (A) is fused with KOH in the presence of an oxidising agent and dissolved in water, it gives a dark green solution of compound (B). Compound (B) disproportionates in neutral or acidic (C) oxidises potassium iodide solution to a compound (D) and

compound (A) is also formed. Identify compounds A to D and also explain the reactions involved.

- A.

P	Q	R	S
MnO_4^-	KIO_3	MnO_2	K_2MnO_4
- B.

P	Q	R	S
MnO_2	K_2MnO_4	MnO_4^-	KIO_3
- C.

P	Q	R	S
MnO_2	MnO_4^-	K_2MnO_4	KIO_3
- D.

P	Q	R	S
K_2MnO_4	MnO_2	MnO_4^-	KIO_3

Answer: B



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220. A violet compound of manganese (A) decomposes on heating to liberate oxygen and compounds (B) and (C) of manganese are formed. Compound (C) reacts with KOH in

the presence of potassium nitrate to give compound (B).

On heating compound (C) with conc. H_2SO_4 and NaCl, chlorine gas is liberated and a compound (D) of manganese along with other products is formed. Identify compounds A to D and also explain the reaction involved.

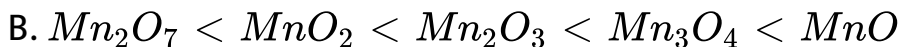
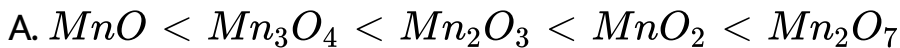
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|----|------------|------------|----------|----------|
| | P | Q | R | S |
| A. | $KMnO_4$ | K_2MnO_4 | $MnCl$ | MnO_2 |
| | P | Q | R | S |
| B. | K_2MnO_4 | MnO_2 | $KMnO_4$ | $MnCl_2$ |
| | P | Q | R | S |
| C. | $KMnO_4$ | K_2MnO_4 | MnO_2 | $MnCl_2$ |
| | P | Q | R | S |
| D. | K_2MnO_4 | $KMnO_4$ | MnO_2 | $MnCl_2$ |

Answer: C



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221. Arrange the oxides of manganese according to increasing acidic strength.



Answer: A



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222. Which of the following transition metal ions has highest magnetic moment ?



Answer: D



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223. Calculate the magnetic moment of a divalent ion in aqueous solution if its atomic number is 25.

A. 2.9 B.M.

B. 5.9 B.M.

C. 6.9 B.M.

D. 9.9 B.M.

Answer: B



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224. When MnO_2 is fused with KOH , a coloured compound is formed, the product and its colour are

A. MnO - colourless

B. $KMnO_4$ - purple

C. K_2MnO_4 - dark green

D. MnO_3 - black

Answer: C



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225. The salts of Cu in +1 oxidation state are unstable because

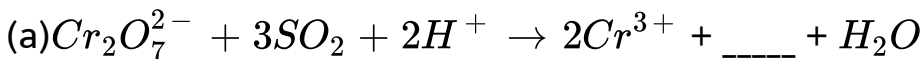
- A. Cu^+ has $3d^{10}$ configuration
- B. Cu^+ disproportionates easily to Cu(0) and Cu^{2+}
- C. Cu^+ disproportionates easily to $Cu(2+)$ and Cu^{2+}
- D. Cu^+ is easily reduced to Cu^{2+}

Answer: B

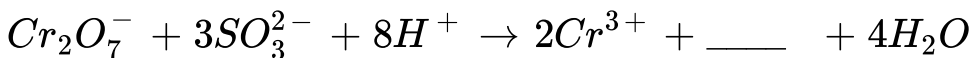


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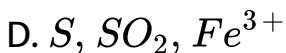
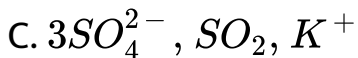
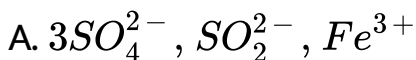
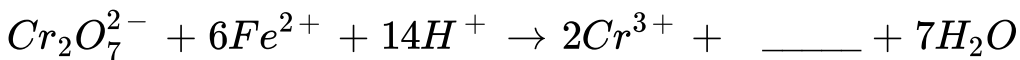
226. Complete the following reactions:



(b)

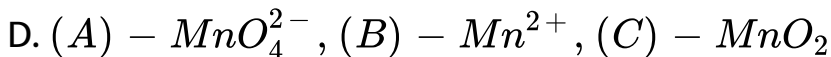
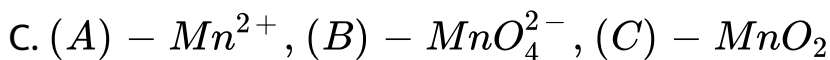
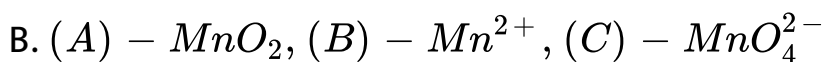
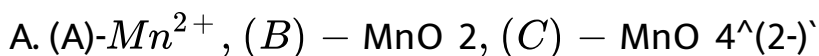


(c) _____)



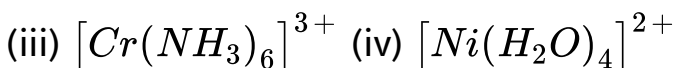
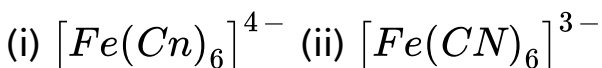
Answer: B

227. A solution of $KMnO_4$ is reduced to various products depending upon its pH. At pH lt 7 it is reduced to a colourless solution (A), at pH = 7 it forms a brown precipitate (B) and at pH gt 7 it gives a green solution (C), (A), (B) and (C) are



Answer: A

228. Arrange the following in increasing value of magnetic moments.



A. (i) lt (ii) lt (iii) lt (iv)

B. (i) lt (ii) lt (iv) lt (iii)

C. (ii) lt (iii) lt (i) lt (iv)

D. (iii) lt (i) lt (ii) lt (iv)

Answer: B



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229. The number of unpaired electrons in gaseous species of Mn^{3+} , Cr^{3+} and V^{3+} respectively are.....and most stable species is.....

- A. 4, 3 and 2, V^{3+} is most stable
- B. 3, 3 and 2, Cr^{3+} is most stable
- C. 4, 3 and 2, Cr^{3+} is most stable
- D. 3, 3 and 3, Mn^{3+} is most stable

Answer: C



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230. Which of the following statements is not correct ?

A. Copper liberates hydrogen from acids

B. In higher oxidation states, manganese forms stable compounds with oxygen and fluorine

C. Mn^{3+} and Co^{3+} are oxidising agents in aqueous solution

D. Ti^{+2} and Cr^{2+} are reducing agents in aqueous solution

Answer: A



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231. Although zirconium belongs to 4d transition series and hafnium to 5d transition series even then they show

similar physical and chemical properties because

A. belong to d-block

B. have same number of electrons

C. have similar atomic radius

D. belongs to the same group of the periodic table

Answer: C



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232. Which has no unpaired electrons?

A. Sc

B. Mn

C. Cu

D. Zn

Answer: D



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233. In $3d$, common oxidation state is

A. +1

B. +2

C. +3

D. +4

Answer: B



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234. Chemical twins are

A. Tc - Re

B. W - Sc

C. Re - Os

D. Mn - Zn

Answer: A



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235. Number of unpaired electron is maximum in

A. Fe

B. Cr

C. Zn

D. Sc

Answer: B



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236. Which of the following gives +7 configuration?

A. Cr

B. Mn

C. Co

D. Ni

Answer: B



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237. The number of transition series in the periodic table are

A. 10

B. 20

C. 40

D. 60

Answer: C



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238. The transuranic elements are prepared by

- A. addition reaction
- B. decomposition reaction
- C. substitution reaction
- D. nuclear reaction

Answer: D



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239. Metal used for making joints in jewellery is

A. Cu

B. Cd

C. Ag

D. Zn

Answer: A



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240. Within each transition series, the oxidation states

A. decreases from left to right

B. first decrease till the middle of the period and then
decreases

C. first decreases till the middle of the period and then increases

D. remains same

Answer: B



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241. Amongst the ion of 3d transition series paramagnetic character increases from Ti^{2+} to

A. Cr^{+2}

B. Mn^{+2}

C. Ni^{+2}

D. Fe^{+2}

Answer: B



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242. Which of the following types of metal form the most efficient catalysts?

A. Transition metals

B. Alkali metals

C. Alkaline earth metals

D. Inert elements

Answer: A



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243. When SO_2 is passed through acidified $K_2Cr_2O_7$ solution

- A. the solution turns blue
- B. the solution is discoloured
- C. SO_2 is reduced
- D. green $Cr_2(SO_4)_3$ is formed

Answer: D



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244. The purple colour of $KMnO_4$ is due to

- A. d - d transition
- B. charge transfer transition
- C. f - f transition
- D. d - f transition

Answer: A



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245. How is sodium chromate converted into sodium dichromate in the manufacture of potassium dichromate from chromite ore?

- A. By the action of concentrated sulphuric acid
- B. By roasting with soda ash
- C. By the action of sodium hydroxide
- D. By the action of lime stone

Answer: A



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246. Identify the metal that forms colourless compounds.

- A. Iron ($Z = 26$)
- B. Chromium ($Z = 24$)
- C. Vanadium ($Z = 23$)

D. Scandium ($Z = 21$)

Answer: D



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247. Lanthanide element is

A. Ac

B. Al

C. Nd

D. Pd

Answer: C



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248. The most common lanthanoid is :

A. Lanthanum

B. Cerium

C. Samarium

D. Plutonium

Answer: B



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249. General electronic configuration of lanthanides is

A. $(n - 2)f^{1-14}(n - 1)d^0-1ns^2$

B. $(n - 2)f^{1-14}(n - 1)d^{0-1}ns^2$

C. $(n - 2)f^{0-14}(n - 1)d^{10}ns^2$

D. $(n - 2)d^{0-1}(n - 1)f^{0-14}ns^1$

Answer: B



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250. The f-block elements are also called as

A. Transition element

B. Rare earth element

C. Representative element

D. Inner transition elements

Answer: D



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251. Lanthanide series belongs to

- A. sixth period
- B. fifth period
- C. seventh period
- D. d - block elements

Answer: A



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252. The no. of incomplete shell in f - block element is

A. 2

B. 1

C. 0

D. 3

Answer: D



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253. Lanthanide series belongs to

A. 3rd period and group 2

B. 4th period and group 4

C. 5th period and group 3

D. 6th period and group 3

Answer: D



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254. The individual member of Lanthanide series is called as

A. Lanthanoid

B. Lanthanons

C. 4f block elements

D. all of these

Answer: D



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255. Usually lanthanides form

- A. ionic bond
- B. covalent bond
- C. co-ordinate bond
- D. hydrogen bond

Answer: A



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256. Shielding effect exerted by the inner electrons decreases in order of

A. $s > p > d > f$

B. $f > d > p > s$

C. $s < p < d < f$

D. $s < p < d < f$

Answer: A



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257. The number of 4f electron s present in Ytterbium Yb (70) is

A. 7

B. 8

C. 13

D. 14

Answer: D



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258. How many unpaired electrons are present in Europium? (atomic number 63)

A. 3

B. 5

C. 6

D. 7

Answer: B



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259. In which of the lanthanide elements, 5d elements does not shift to 4f orbitals ?

A. Ce, Eu, Yb

B. La, Gd, Lu

C. Ce, Nd, Dy

D. Sm, Ho, Er

Answer: B



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260. In which part of the periodic table inner transition elements are placed ?

A. Left

B. Right

C. Centre

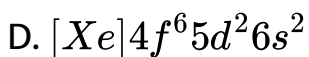
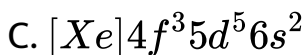
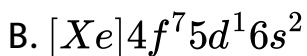
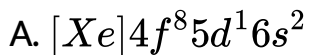
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Answer: D



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261. The electronic configuration of gadolinium (At. No 64) is:



Answer: B



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262. The total number of rare earth elements is

A. 8

B. 32

C. 14

D. 10

Answer: C



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263. Among the lanthanides the one obtained by synthetic method is

A. Lu

B. Pm

C. Pr

D. Gd

Answer: B



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264. Lanthanoids used in glass blower's goggles are

A. Pr and Nd

B. Eu and Gd

C. Tb and Dy

D. Pm and Sm

Answer: A



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265. Transuranic elements begin with

- A. U
- B. Cm
- C. Pu
- D. Np

Answer: D



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266. Which lanthanoid is most commonly used?

- A. Lanthanum

B. Nobelium

C. Thorium

D. Cerium

Answer: D



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267. Which of the following can exhibit +4 oxidation state?

A. La

B. Ce

C. Eu

D. Gd

Answer: B



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268. The $+3$ ion of which one of the following has half filled $4f$ subshell?

A. La

B. Lu

C. Gd

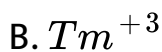
D. Ac

Answer: C



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269. Which of the following has no unpaired e^- ?



Answer: D



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270. The no. of unpaired electron in Ce^{+3} in



B. 0

C. 1

D. 3

Answer: C



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271. The most stable +2 oxidation state in Lanthanides is

A. Ce

B. Eu

C. Tb

D. Dy

Answer: B



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272. Yb show +2 oxidation state for the following configuration

A. f^{14}

B. f^7

C. f^6

D. f^0

Answer: A



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273. The most stable state of Ce ($Z = 58$) is

A. 2

B. 3

C. 4

D. 5

Answer: C



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274. Which of the ion is colourless?

A. Gd^{+3}



Answer: B



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275. La^{+3} ion gives a colourless compound due to

A. completely filled 4f subshell

B. empty 4f subshell

C. half filled 4f subshell

D. unpaired electron

Answer: B



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276. Ions of Lanthanide and actinide series have unpaired electrons in the $(n - 2)$ f orbital and hence they are

- A. diamagnetic
- B. paramagnetic
- C. ferromagnetic
- D. colourless

Answer: B



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277. Ce^{+4} ion is isoelectronic with

A. La^{+3}

B. Gd^{+3}

C. Lu^{+3}

D. Both (a) and (c)

Answer: A



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278. If the lanthanoid element with x f electrons has a pink color, then the lanthanoid with $(14 - x)$ f electrons will have the colour as:

A. Blue

B. Red

C. Green

D. Pink

Answer: D



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

A. an oxidising agent

B. a reducing agent

C. either (a) or (b)

D. none of these

Answer: D



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280. La^{3+} and Lu^{3+} are

A. Both paramagnetic

B. Both diamagnetic

C. La^{3+} is diamagnetic and Lu^{3+} paramagnetic

D. None of these

Answer: B



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281. The lanthanoid contraction is related to

- A. valence electrons
- B. densities
- C. ionic radii
- D. nucleus of the atom

Answer: C



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282. Super conductors are derived from compound of:

- A. p - block elements

B. Lanthanide

C. Actinides

D. Transition elements

Answer: D



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283. Lanthanide contraction is caused due to -

A. Zr and Y have nearly same radius

B. Zr and Nb have similar oxidation state

C. Zr and Hf have same radius

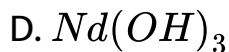
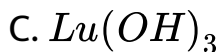
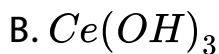
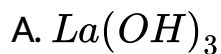
D. Zr and Zn have same oxidation state

Answer: C



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284. Which of the following is least basic?



Answer: C



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285. The decrease in size of inner transition element is

- A. more
- B. not regular
- C. low
- D. unpredictable

Answer: C



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286. The basicity of Lanthanide hydroxide

- A. increases
- B. decreases

C. first increases then decreases

D. first decreases and then increases

Answer: B



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287. Which of the following is incorrect?

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

B. Ionic radius of Ln^{+3} ions decreases

C. La is known as transition series rather than Lanthanide series.

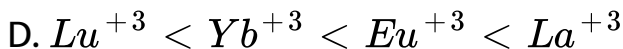
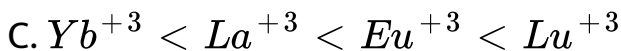
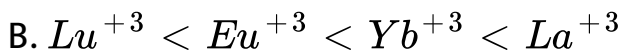
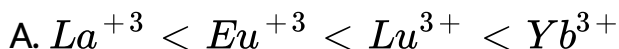
D. Atomic radii of Zr and Hf are same because of Lanthanide contraction.

Answer: A



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288. The correct order of the ionic radii of the ions is



Answer: D



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289. Basic nature of the compounds of

- A. Lanthanoids gt actinoids
- B. Lanthanoids lt actinoids
- C. Lanthanoids = actinoids
- D. they are neutral

Answer: B



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290. With the increase in atomic numbers the atomic radii go on decreasing in case of

- A. d- block element
- B. f- block element
- C. Radioactive series
- D. p - block element

Answer: B



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291. Chemical twins are present in which transition series?

- A. 2nd and 3rd

B. 1st and 2nd

C. 3rd and 4th

D. 4th and 5th

Answer: A



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292. Nature of all Lanthanides is

A. Acidic

B. Neutral

C. Basic

D. Phenolic

Answer: C



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293. Which of the following is not a chemical twin?

- A. Niobium and Tantalum
- B. Niobium and Actinium
- C. Zirconium and Hafnium
- D. Molybdenum and Tungsten

Answer: B



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294. From La to Lu basicity of hydroxides

- A. increases
- B. remains same
- C. decreases
- D. cannot be predicted

Answer: C



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295. The colours of lanthanide ions arise due to _____ transition.

- A. p - f

B. d - d

C. f - d

D. f - f

Answer: D



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296. The steady decrease along the lanthanide series is called lanthanide contraction and in all amounts to

A. $0.15^0 A$

B. $0.22^0 A$

C. $0.09^0 A$

D. $0.93^0 A$

Answer: B



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297. Select the correct statement/s among the following

- A. Lanthanide hydroxides are less basic than actinide hydroxides
- B. Lanthanide hydroxides are more basic than actinide hydroxides
- C. Basic strength of their hydroxides are equal
- D. Their hydroxides are acidic

Answer: A



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298. Contraction in atomic and ionic radii is given by

- A. lanthanides but not actinides
- B. actinides but not lanthanides
- C. both lanthanides and actinides
- D. neither lanthanides nor actinides

Answer: C



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299. Chemical twins are found in

A. s - block elements

B. p - block elements

C. d - block elements

D. f - block elements

Answer: C



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300. The lanthanide contraction is responsible for the fact that

A. Zr and Y have about the same radius

- B. Zr and Nb have similar oxidation state
- C. Zr and Hf have about the same radius
- D. Zr and Zn have the same oxidation state

Answer: C



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301. Pair of elements having almost equal size due to lanthanoid contraction are

- A. Al and Ga
- B. Zr and Hf
- C. Sb and Bi

D. Sc and Te

Answer: B



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302. The lanthanide contraction is responsible for the fact that

- A. Zr and Y have about the same radius
- B. Zr and Nb have similar oxidation state
- C. Zr and Hf have about the same radius
- D. Zr and Zn have the same oxidation state

Answer: C



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303. Which of the following statements is not correct ?

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

B. La is actually an element of transition series rather than lanthanoids

C. In lanthanoid series, +2 state ionic radius of Lu^{2+} is smallest

D. Atomic radius of Zr and Hf are same because of lanthanoid contraction

Answer: A



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304. The lanthanide contraction is responsible for the fact that

- A. Zr and Y have the same radius
- B. Zr and Zn have the same oxidation state
- C. Zr and Nb have the similar oxidation state
- D. Zr and Hf have about the same radius

Answer: D



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305. Transuranium elements are

- A. heavier than uranium
- B. lighter than uranium
- C. have lesser atomic no. than uranium
- D. have same atomic no. as that of uranium

Answer: A



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306. Which Actinide does not occur in nature?

- A. Th
- B. Am
- C. U

D. Pa

Answer: B



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307. Which of the following belong to actinide series ?

A. Nd

B. U

C. Sm

D. Au

Answer: B



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308. In the periodic table actinons belong to

- A. 6th period group 4
- B. 6th period group 3
- C. 7th period group 3
- D. 7th period group 4

Answer: C



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309. The individual members of the actinide series is called
as

- A. actinoid
- B. actinon
- C. 2nd inner transition element
- D. all of these

Answer: D



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310. The transuranic elements are prepared by

- A. addition reaction
- B. decomposition reaction
- C. substitution reaction

D. nuclear reaction

Answer: D



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311. Most common oxidation state of actinoids is

A. +4

B. +5

C. +2

D. +3

Answer: D



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312. The elements after uranium are called:

- A. actinides
- B. transition elements
- C. transuranicelements
- D. lanthanum

Answer: C



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313. For actinides the differentiating electron enters _____ orbitals.

A. 5f

B. 4d

C. 4f-d

D. f

Answer: A



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314. Which of the following properties are similar for lanthanides and actinides?

A. Formation of oxo-ions

B. Tendency to form complexes

C. Filling of $(n - 2) f$ orbitals

D. acidic character

Answer: C



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315. Which of the following properties are different for lanthanides and actinides?

A. Their radioactive nature

B. Their tendency to form oxo-ions

C. Their tendency to form complexes

D. All of them

Answer: D



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316. Which of the following statement is not correct ?

- A. Nitrates and sulphates of lanthanide are water soluble
- B. Nitrates and sulphates of actinides are water soluble
- C. Nitrates and sulphates of lanthanide and actinides are water soluble
- D. Both (a) and (b)

Answer: C

317. Which of the following statement is correct?

- A. Paramagnetic nature of lanthanides can be explained easily
- B. Paramagnetic nature of actinides can be explained easily
- C. Paramagnetic nature of actinides cannot be explained easily
- D. Both (a) and (c)

Answer: D

318. Among the following which statement/s is/are true?

(A) Lanthanides have greater tendency to form complexes

(B) Actinides have greater tendency to form complexes

(C) Lanthanides have lesser tendency to form complexes

(D) Actinides have lesser tendency to form complexes

A. Only A

B. Only D

C. B and C

D. C and D

Answer: C



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319. What is the total number of inner transition elements in the periodic table?

A. 10

B. 14

C. 28

D. 30

Answer: C



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320. In lanthanides, last electrons enters into $(n - 2) f$ subshell. What is the value of n ?

A. 4

B. 6

C. 7

D. 8

Answer: B



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321. Element with maximum atomic number is

A. Lanthanum

B. Actinium

C. Scandium

D. Halfnium

Answer: B



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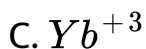
322. The characteristic colour to the cation of inner-transition element is due to

- A. absorbed light
- B. transmitted light
- C. monochromatic light
- D. pair of electron

Answer: B

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323. Find out the smallest ion from those given below.



Answer: C

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324. Filling of which level is not regular for actinides ?

A. 4f

B. 2d

C. 5f

D. 4s

Answer: C



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325. The element with electronic configuration

$[Rn]5f^26d^17s^2$ has atomic number

A. 90

B. 91

C. 95

D. 100

Answer: B



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326. Which of the following is used in preparation of optical glass of camera having high refractive index ?

A. Ceric compounds

B. CeO_2

C. Oxides of lanthanoids

D. Gadolinium sulphate

Answer: C



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327. Lanthanide contraction is caused due to -

- A. The appreciable shielding on outer electrons by 4f electrons from the nuclear charge
- B. The appreciable shielding on outer electrons by 5d electrons from the nuclear charge
- C. The same effective nuclear charge from Ce to Lu
- D. The poor shielding on outer electrons by 4f electrons from the nuclear charge

Answer: B



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328. Which is the correct order of ionic sizes ?

(Atomic no . : Ce = 58 , Sn = 50 , Yb = 70 and Lu)

A. Ce gt Sn gt Yb gt Lu

B. Sn gt Ce gt Lu gt Yb

C. Lu gt Yb gt Sn gt Ce

D. Sn gt Yb gt Ce gt Lu

Answer: A



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329. Cerium ($Z = 58$) is an important member of the lanthanoids . Which of the following statements about cerium is incorrect ?

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

B. Cerium (IV) acts as an oxidising agent

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

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

Answer: C



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330. The actinoids exhibit more number of oxidation states in general than the lanthanoids. This is because

- A. the 5f orbitals are more buried than the 4f orbitals
- B. there is a similarity between 4f and 5f orbitals in their angular part of the wave function
- C. the actinoids are more reactive than the lanthanoids
- D. the 5f orbitals extend further from the nucleus than the 4f orbitals

Answer: D



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331. Larger number of oxidation states are exhibited by the actinoids than those by the lanthanoids, the main reason being

- A. 4 f 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: B



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332. Post lanthanide elements have smaller radii because of

- A. Lanthanide expansion
- B. Lanthanide contraction
- C. Actinide expansion
- D. Actinide contraction

Answer: B



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333. f-block elements are called as

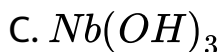
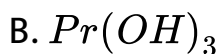
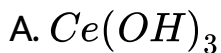
- A. Alkaline earth element
- B. Earth metal
- C. Rare earth element
- D. Representative element

Answer: C



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334. Most basic hydroxide is



D. $\text{Sm}(\text{OH})_3$

Answer: A



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335. Which of the ions is colourless inspite of the presence of unpaired electrons ?

A. Eu

B. Pd

C. Nd

D. Gd

Answer: D



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336. Ce^{4+} is stable .This is because of

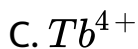
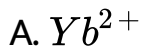
- A. empty orbitals
- B. half filled orbitals
- C. completely filled orbitals
- D. no unpaired electrons

Answer: A



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337. Which is a good reducing agent '?



Answer: A



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338. Which has same electronic configuration as expected?



D. Er

Answer: A



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339. f-block elements are called

A. Representative elements

B. Transition elements

C. Inner transition elements

D. Inert elements

Answer: C



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340. The basicity of lanthanoid hydroxides, across the lanthanoid series

- A. increases
- B. decreases
- C. first increases then decreases
- D. first decreases and then increases

Answer: B



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341. The no. of incomplete shell in f - block element is

A. 2

B. 1

C. 0

D. 3

Answer: D



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342. Although zirconium belongs to 4d transition series and hafnium to 5d transition series even then they show similar physical and chemical properties because

A. belong to d-block

B. have same number of electrons

C. have similar atomic radius

D. belongs to the same group of the periodic table

Answer: C



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343. What is the general molecular formula of the products obtained on heating lanthanoid (Ln) with sulphur?

A. Ln S

B. Ln S_3

C. $\text{Ln}_3 \text{S}_2$

D. $\text{Ln}_2 \text{S}_3$

Answer: B



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344. Which of the following statement(s) is/are incorrect for pair of element Zr-Hf ?

- A. Both possess same number of valence electrons
- B. Both have identical atomic sizes
- C. Both have almost identical ionic radii
- D. Both of these belong to same period of periodic table

Answer: D





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Test Your Grasp

1. The number of transition series in the periodic table are

A. 20

B. 28

C. 30

D. 40

Answer: D



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2. What is the general electronic configuration of transition elements

A. $(n - 1)d^{1-10}ns^{0/1/2}$

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

C. $(n - 1)d^{0-10}ns^{1/2}$

D. $(n - 1)d^{1-10}ns^0$

Answer: A



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3. Each transition series contains only 10 elements because

A. d-orbitals are five in number

B. there is only 10 columns reserved for them in the periodic table

C. the d subshell can accommodate maximum 10 electrons

D. both (a) and (c)

Answer: D



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4. Which one of the following refers to configuration of transition elements ?

A. 2,8,18,3

B. 2,8,18,8

C. 2,8,14,2

D. 2,8,6

Answer: C



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5. The outer electronic configuration of chromium is

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

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

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

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

Answer: B



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6. Which of the following does NOT show different oxidation states?

A. Iron

B. Copper

C. Zinc

D. Manganese

Answer: C

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7. Calculate the oxidation number of Mn in $KMnO_4$ molecule.

A. 2 +

B. 4 +

C. 6 +

D. 7 +

Answer: D

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8. The properties of transition metals are in between the properties of __ block elements

A. s and f

B. p and f

C. s and p

D. d and f

Answer: C



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9. Which transition metal shows the highest oxidation state ?

A. Sc

B. Ti

C. Mn

D. Zn

Answer: C



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10. Which of the following would be diamagnetic?

A. Cu^{2+}

B. Ni^{2+}

C. Sc^{3+}

D. Ti^{3+}

Answer: C



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11. The element present immediately below Zn in the periodic table in the same column, has atomic number equal to

A. 48

B. 40

C. 50

D. 30

Answer: A



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12. Oxidation state of +1 is possible with

A. Cu and Ni

B. Cu and Zn

C. Cu and Cr

D. Cr and Sc

Answer: C



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13. For Sc (2 1), if both 3d and 4s electrons are involved in bonding, the oxidation state will be

A. +4

B. +3

C. +2

D. +5

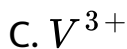
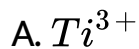
Answer: B



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14. Which one of the following forms a colourless solution in aqueous medium ?

(Atomic number : $Sc = 21$, $Ti = 22$, $V = 23$, and $Cr = 24$)



Answer: B



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15. Which of the following group belongs to transition series ?

A. 1

B. 2

C. 7

D. 13

Answer: C



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16. In transition elements, the differentiating electron enters into _____ subshell.

A. ns subshell

B. np subshell

C. (n-1) d subshell

D. (n-2) f subshell

Answer: C



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17. Which of has the highest number of unpaired electrons?



Answer: D



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18. The range of wavelength of the visible light is

A. 500 A - 2000 A

B. 2000 A - 4000 A

C. 4000 A - 8000 A

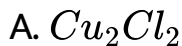
D. gt 8000 A

Answer: C



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19. Which of the following salt give coloured aqueous solution ?



Answer: B



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20. Sulphide ore of Zinc is

A. Zinc blende

B. Sphaelerite

C. Frenklinite

D. Both (a) and (b)

Answer: D



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21. Which of the following is not a condition for complex formation?

A. Small size

B. Higher nuclear charge

C. Availability of vacant d orbitals

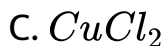
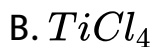
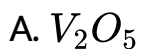
D. Variable Oxidation State

Answer: D



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22. Ziegler-Natta catalyst is



Answer: B



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23. The alloy brass is made up of

A. Cu and Zn

B. Cu and Ni

C. Cu and Sn

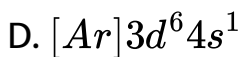
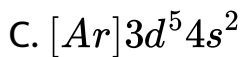
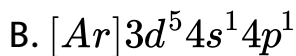
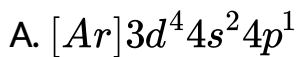
D. Cu, Cd

Answer: A



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24. Electronic configuration of manganese ($Z = 25$) is _____.



Answer: C



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25. The highest oxidation state shown by any transition element is

A. 3

B. 5

C. 4

D. 7

Answer: D



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26. Coinage metals show the properties of

A. alkaline earth metals

B. Transition metals

C. Inner transition metals

D. Noble metals

Answer: B



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27. Copper can be regarded as a transition element only in the oxidation state is

A. -1

B. 0

C. $+1$

D. $+2$

Answer: D



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28. The colour of transition metal ions is due to

- A. s-s transition
- B. d-d transition
- C. p-p transition
- D. f- f transition

Answer: B



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29. The last electron of transition element is called

- A. s-electron

B. p-electron

C. d-electron

D. f-electron

Answer: C



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30. Bronze is an alloy of:

A. Cu, Sn, Zn

B. Cu, Ni, Zn

C. Cu, Ag, Zn

D. Al, Sn, Zn

Answer: A



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31. Lightest and the heaviest transition metals respectively are

A. Sc, OS

B. Sc, Fe

C. OS, Sc

D. Cu, Fe

Answer: A



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32. Which of the following is not regarded as a transition element ?

A. Co

B. Zn

C. Sc

D. Mn

Answer: B



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33. Which set of transition series of the d-block is CORRECT?

A. 3d,4d,5d,6d

B. 2d,3d,4d,5d

C. 3d,5d,6d,7d

D. 4d,5d,6d,7d

Answer: A



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34. The most abundant transition metal is

A. Fe

B. Cu

C. Zn

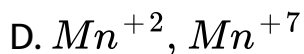
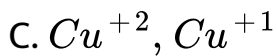
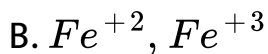
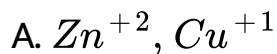
D. Ni

Answer: A



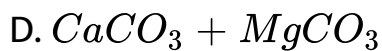
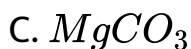
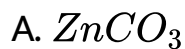
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35. Which one of the following pair of ions are isoelectronic?



Answer: A

36. Calamine is



Answer: A

37. Inner transition elements belongs to which block of the periodic table ?

A. s - block

B. p - block

C. d - block

D. f - block

Answer: D



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38. Which of the following elements is / are lanthanides?

A. La

B. Gd

C. Ac

D. Both (a) and (b)

Answer: D



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39. Which of the following is a chemical twins?

A. Ag and Au

B. Cu and Ni

C. Zr and Hf

D. Cl and Br

Answer: C



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40. In inner transition elements, which f subshell gets filled up with electrons ?

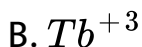
- A. $(n - 1)$ f subshell
- B. $(n + 1)$ f subshell
- C. $(n - 2)$ f subshell
- D. $(n + 2)$ f subshell

Answer: C



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41. Which of the following ion of lanthanides is / are coloured?



D. Both (b) and (c)

Answer: D



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42. La^{+3} and Lu^{+3} have their ionic radii 'a' and 'b' respectively, then lanthanide contraction will be equal to

A. $b-a$

B. $a-b$

C. $\frac{b}{a}$

D. $\frac{a}{b}$

Answer: B



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43. Which lanthanide element does not occur in nature ?

A. Promethium

B. Ytterbium

C. Samarium

D. Lutetium

Answer: A



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44. For, both lanthanides and actinides, which of the following statement is false ?

A. Both involves the filling of $(n - 2)$ f subshell

B. In atoms of both the series, three outer shells are partly filled while the remaining are completely filled

C. Some of them are electronegative in nature

D. Their cation with unpaired electrons are
paramagnetic in nature

Answer: C



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45. In which of the following pairs, tripositive ions of both will have same colour ?

A. Pm (61), Er (68)

B. La (57) , Tb(65)

C. Sm(62) , Dy(66)

D. Both (a) and (c)

Answer: D



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46. Ionic radius of La^{+3} is 106 pm, ionic radius of Lu^{+3} be

A. 89 pm

B. 87 pm

C. 85 pm

D. 95 pm

Answer: C



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47. The most common oxidation state of lanthanoids is

A. 4 +

B. 3 +

C. 6 +

D. 2 +

Answer: B



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48. Which of the following elements belong to actinoid series?

A. Cerium

B. Lutetium

C. Thorium

D. lanthanum

Answer: C



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49. Which element among the lanthanoids has the smallest atomic radius ?

A. Cerium

B. Lutetium

C. Europium

D. Gadolinium

Answer: B



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50. The properties of Zr and Hf are similar because

- A. both have same atomic radii
- B. both belong to d block
- C. both belong to same series
- D. both have same number of electrons

Answer: A



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51. Which of the following statement/s is / are true?

- A. Lanthanides form oxo-ions
- B. Actinides form oxo-ions
- C. Both lanthanides and actinides form oxo-ions
- D. Neither lanthanides nor actinides form oxo-ions

Answer: B



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52. Which of the following statement/s is / are true ?

- A. Actinides constitute second inner transition series

B. Actinides are all radioactive in nature

C. Elements from atomic number 93 to 103 are transuranic elements

D. All of them

Answer: D



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53. Element with following accepted electronic configuration $[\text{Rn}] 5f^7 6d^1 7s^2$ has atomic number equal to

A. 95

B. 96

C. 98

D. 103

Answer: B



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54. Lanthanide and Actinide contraction refers to

A. Atomic radii

B. Ionic radii

C. Basicity of their hydroxides

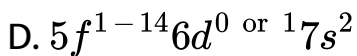
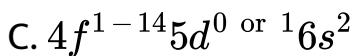
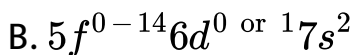
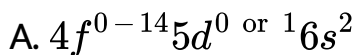
D. Both (a) and (b)

Answer: D



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55. General electronic configuration of lanthanides is



Answer: C



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56. Oxidation state/s exhibited by Ce is / are

A. +2 only

B. +3, +4

C. +4 only

D. +2, +3, +4

Answer: B



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57. Lanthanoids are

A. 3rd group and 7th period

B. 3rd group and 6th period

C. 4th group and 7th period

D. 3rd group and 8th period

Answer: B



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58. Choose the stable oxidation states of cerium (Ce).

A. 4 +

B. 2 +

C. 1 +

D. 5 +

Answer: A



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59. For hydroxides of lanthanides

- A. basicity decreases from La to Lu
- B. basicity increases from La to Lu
- C. acidity decreases from La to Lu
- D. basicity remains same from La to Lu

Answer: A



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60. Some statements are given below about lanthanides :

(A) Their tripositive ions are all coloured

(B) With increase in atomic number, their atomic radii increases

(C) Gadolinium exhibit oxidation state of +3 only

(D) Last electrons in them enters into 5f orbitals

Among the above

A. Only A is false

B. A, B and C are false

C. A, B and D are false

D. B, C and D are false

Answer: C



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