NEET : CHAPTER WISE TEST-5

SUBJECT :- CHEMISTRY **DATE.....**

CLASS :- 12th **NAME.....**

CHAPTER :- d & f-BLOCK **SECTION.....**

(SECTION-A)

1. For a catalyst which condition is not essential ?
(A) Variable valency
(B) High ionisation energy
(C) Empty orbitals
(D) Free valency on the surface

2. From the chromium to nickel, number of bonds :-
(A) Decreases continuously
(B) Increases continuously
(C) Do not change
(D) Increases alternately

3. Which of the catalyst is used in contact process?
(A) V_2O_5 (B) Fe and Mo
(C) Pd (D) Cu

4. In the brass, which element is mixed with copper?
(A) Zn (B) Sb (C) Bi (D) Pb

5. To which of the following series the transition elements from Z = 39 to Z = 48 belong?
(A) 3d series (B) 4d series
(C) 5d series (D) 6d series

6. Coinage metals show the properties of :
(A) Typical elements
(B) Normal elements
(C) Transition elements
(D) Inert elements

7. The most stable oxidation state of Mn is-
(A) Mn^{+4} (d^3) (B) Mn^{+6} (d^1)
(C) Mn^{+2} (d^5) (D) Mn^{+3} (d^4)

8. Which pair of ions is colourless ?
(A) Mn^{3+}, Co^{3+} (B) Fe^{3+} , Cr^{3+}
(C) Zn^{2+}, Sc^{3+} (D) Ti^{2+}, Cu^{2+}

9. Zero magnetic moment will be shown by the compound-
(A) $[Cr(NH_3)_6]^{+3}$ (B) $[Ag(CN)_2]^-$
(C) $[Fe(CN)_6]^{-3}$ (D) $[CoF_6]^{-3}$

10. CrO_3 is red or orange in colour. The nature of oxide is :-
(A) Acidic (B) Basic
(C) Amphoteric (D) Neutral

11. The elements from thorium (At. No.90) to lawrencium (At. No.103) in which 5f energy levels are filled up are called :
(A) lanthanides (B) rare earths
(C) actinides (D) transuranics

12. Cerium can show the oxidation state of +4 because
(A) it resemble alkali metals
(B) it has very low value of I.E.
(C) of its tendency to attain noble gas configuration of xenon
(D) of its tendency to attain $4f^7$ configuration

13. The elements from cerium (At. No. 58) to lutetium (At. No. 71) in which 4f energy levels are filled up are called :
(A) lanthanides (B) rare earths
(C) lanthanones (D) all the above

14. Which of the following is a lanthanide ?
(A) Ta (B) Rh (C) Th (D) Gd

15. Atomic number of the element having ns^1 configuration belong to 3d transition series would be :–
(A) Only 24 (B) Only 25
(C) Only 29 (D) 24 & 29

16. Pick out the wrong statement :-
(A) $K_2Cr_2O_7$ reduces ferric sulphate to ferrous sulphate
(B) Iron do not form amalgam
(C) Permanent magnet is made by an alloy called Alnico
(D) In the Lathanides, ionic radius decreases from La^{+3} to Lu^{+3}

17. Pick out the incorrect statement for the transition metals :
(A) Cu^+ (d^{10}) is a transition metal ion
(B) Transition metal ions are coloured
(C) 5d transition series is placed in 5th period
(D) Cr^{+6} is more oxidising than Cr^{+3}

18. Which of the following statement is not correct ?
(A) Fe, Ni, Co form interstitial compound
(B) $CuSO_4 + Ca(OH)_2$ is called Bordeaux mixture
(C) Verdigris is basic copper acetate $[Cu(COOCH_3)_2 . Cu(OH)_2]$
(D) 24 carat gold is an alloy of Au and Cu

19. Pick out the correct order :-
(A) Electrical conductivity Ag < Au < Al
(B) Density Hg < Au < Os
(C) Melting point Cr > Mo > W
(D) Atomic size Sc < Ti < V

20. Among Sc(III), Ti(IV), Ni(II) and Cu(II) ions :-
(A) All paramagnetic
(B) All diamagnetic
(C) Sc(III), Ti(IV), paramagnetic and Ni(II), Cu(II) diamagnetic
(D) Ni (II), Cu(II) paramagnetic and Sc(III), Ti(IV) diamagnetic

21. d- block elements form colored ions because these elements :-
(A) Cannot absorb the radiation in the visible region
(B) Involve d-d transitions which fall in the visible region
(C) Allows d-s transition
(D) Absorb other colours except those required for d-d transition

22. By which of the following ion, a transition metal can be brought in to its highest oxidation state ?
(A) F^- (B) Cl^- (C) Br^- (D) I^-

23. Which of the following sets of elements exhibits decreasing order of atomic radii ?
(a) Sc, Y, La (b) Ti, V, Cr
(c) Ni, Cu, Zn (d) K, Ca, Sc
Correct answer is :-
(A) Only b (B) b and c
(C) b and d (D) All

24. Fe^{+3} is more stable than Fe^{+2}, the reason is/are :
(a) 1st and 2nd I.P. difference is less than 11.0 eV
(b) Core of Fe^{+3} is more stable
(c) 2nd and 3rd I.P. difference is less than 11.0 eV
(d) I.P. of Fe+3 is high
The correct answer is :-
(A) Only a (B) Only b
(C) a b and d (D) b and c

25. Which of the following set of metals can form alloy ?
(A) Cu – Au (B) Li – Na
(C) Fe – Hg (D) All

26. Among the following outermost configurations of transition metals, which shows the highest oxidation state ?
(A) $3d^3\ 4s^2$ (B) $3d^5\ 4s^1$
(C) $3d^5\ 4s^2$ (D) $3d^6\ 4s^2$

27. Which of the following is ferromagnetic ?
(A) Cu, Ag, Au (B) Fe, Co, Ni
(C) Zn, Cd, Hg (D) Ca, Sr, Ba

28. Which of the following contains the maximum number of unpaired electrons ?
(A) $TiCl_3$ (B) $MnCl_2$
(C) $FeSO_4$ (D) $CuSO_4$

29. Which oxide of manganese is acidic in nature?
(A) MnO (B) Mn_2O_7
(C) Mn_2O_3 (D) MnO_2

30. For the same transition metal ion, the colour of its compound will depend upon the :
(A) Temperature of the reaction
(B) Pressure of the reaction
(C) Nature of ligands or Lewis bases attached to the metal ion
(D) Concentration of the ligands

31. Copper showing +2 oxidation state uses :
(A) One electron from 4s and one from 3d orbitals
(B) Both the electrons from 4s orbitals
(C) Both the electrons from 3d orbitals
(D) None of these

32. Because of lanthanide contraction, which of the following pairs of elements have nearly same atomic radii ? (Numbers in the parenthesis are atomic numbers).
(A) Zn (40) and Nb (41)
(B) Zr (40) and Hf (72)
(C) Zr (40) and Ta (73)
(D) Ti (22) and Zr (40)

33. The most characteristic oxidation state of lanthanides is :
(A) +2 (B) +3
(C) +4 (D) none of these

34. Name the three lanthanides which show +2 oxidation state also .
(A) Sm, Tb, Gd (B) Sm, Eu, Yb
(C) La, Gd, Lu (D) Yb, Pm, Sm

35. An increase in both atomic and ionic radii with atomic number occurs in any group of the periodic table. In accordance of this the ionic radii of Ti (IV) and Zr (IV) ions are 0.68 Å and 0.74 Å respectively but for Hf (IV) ion the ionic radius is 0.75 Å, which is almost the same as that for Zr (IV) ion. This is due to :-
(A) greater degree of covalency in compounds of Hf^{4+}
(B) Lanthanide contraction
(C) Difference in the co ordination number of Zr^{+4} and Hf^{+4} in their compounds
(D) Actinide contraction

(SECTION-B)

36. More number of oxidation states are exhibited by the actinoids than by the lanthanoids. The main reason for this is :
(A) more active nature of the actinoids
(B) more energy difference between 5f and 6d orbitals than that between 4f and 5d orbitals
(C) lesser energy difference between 5f and 6d orbitals than that between 4f and 5d orbitals
(D) greater metallic character of the lanthanoids than that of the corresponding actinoids

37. Which one of the following ions is the most stable in aqueous solution?
(A) V^{3+} (B) Ti^{3+}
(C) Mn^{3+} (D) Cr^{3+}

38. The correct order of decreasing second ionisation enthalpy of Ti(22), V(23), Cr(24) and Mn(25) is :–
(A) Mn > Cr > Ti > V
(B) Ti > V > Cr > Mn
(C) Cr > Mn > V > Ti
(D) V > Mn > Cr > Ti

39. Which one of the elements with the following outer orbitals configurations may exhibit the largest number of oxidation states ?
(A) $3d^2 4s^2$ (B) $3d^3 4s^2$
(C) $3d^5 4s^1$ (D) $3d^5 4s^2$

40. Which of the following ions will exhibit colour in aqueous solutions ?
(A) Sc^{3+} (Z = 21) (B) La^{3+} (Z = 57)
(C) Ti^{3+} = (Z = 22) (D) Lu^{3+} (Z = 71)

41. For the four successive transition elements (Cr, Mn, Fe and Co), the stability of +2 oxidation state will be there in which of the following order ?
(A) Mn > Fe > Cr > Co
(B) Fe > Mn > Co > Cr
(C) Co > Mn > Fe > Cr
(D) Cr > Mn > Co > Fe
(At. no.: Cr = 24, Mn = 25, Fe = 26, Co = 27)

42. $KMnO_4$ reacts with Br_2 in alkaline medium to give bromate ion. The oxidation state of Mn changes from +7 to :
(A) +6 (B) +4 (C) +3 (D) +2

43. Which of the following statements is not true ?
(A) $K_2Cr_2O_7$ solution in acidic medium is orange
(B) $K_2Cr_2O_7$ solution becomes yellow on increasing the pH beyond 7
(C) On passing H_2S through acidified $K_2Cr_2O_7$ solution, a milky colour is observed
(D) $Na_2Cr_2O_7$ is preferred over $K_2Cr_2O_7$ in volumetric analysis

44. Which one of the following does not correctly represent the correct order of the property indicated against it ?
(A) Ti < V < Cr < Mn : increasing melting points
(B) Ti < V < Mn < Cr : increasing 2^{nd} ionization enthalpy
(C) Ti < V < Cr < Mn : increasing number of oxidation states
(D) Ti < V^{3+} < Cr^{3+} < Mn^{3+} : increasing magnetic moment

45. The catalytic activity of transition metals and their compounds is discribed mainly to : –
(A) their ability to adopt variable oxidation states
(B) their chemical reactivity
(C) their magnetic behaviour
(D) their unfilled d-orbitals

46. $KMnO_4$ can be prepared from K_2MnO_4 as per the reaction :

$$3MnO_4^{2-} + 2H_2O \rightleftharpoons 2MnO_4^- + MnO_2 + 4OH^-$$

The reaction can go to completion by removing OH^- ions by adding : –
(A) SO_2 (B) HCl
(C) KOH (D) CO_2

47. Magnetic moment of 2.84 B.M. is given by :
(At. no.:), Ni = 28, Ti = 22, Cr = 24, Co = 27)
(A) Ti^{3+} (B) Cr^{2+}
(C) Co^{2+} (D) Ni^{2+}

48. Which of the following processes does not involve oxidation of iron ?
(A) Decolourization of blue $CuSO_4$ solution by iron
(B) Formation of $Fe(CO)_5$ from Fe
(C) Liberation of H_2 from steam by iron at high temperature
(D) Rusting of iron sheets

49. **Assertion :** Zn^{2+} is diamagnetic
Reason : The electrons are lost from 4 *s* orbital to form Zn^{2+}
(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.
(B) If both assertion and reason are true but reason is not the correct explanation of the assertion.
(C) If assertion is true but reason is false.
(D) If assertion is false but reason is true.

50. **Assertion :** Transition metals show variable valence.
Reason : Due to a large energy difference between the ns^2 and $(n-1)d$ electrons.
(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.
(B) If both assertion and reason are true but reason is not the correct explanation of the assertion.
(C) If assertion is true but reason is false.
(D) If assertion is false but reason is true.