[MCQ – 2 3M – 3]

One mark questions:

1. What are transition elements?
2. Write the general electronic configuration of d- block elements.
3. What is the condition for an element to show paramagnetic property?
4. Which element in d-block exists in liquid state at room temperature?
5. Write the equation to calculate magnetic moment.
6. Most of the transition elements are paramagnetic. Give reason.
7. What is the unit of magnetic moment?
8. Which element in 3d series exhibits maximum oxidation state?
9. What are pseudo transition elements? Why are they called so?
10. Zn, Cd and Hg are not considered as transition metals. Why? **OR** Zn, Cd and Hg are called as pseudo transition elements. Why?
11. Mention the general characteristics of transition elements.
12. On what basis you can say that scandium is a transition element but zinc is not?
13. Give an account for high melting and boiling points of transition elements.
14. Silver atom has completely filled d-orbital's ($4d^{10}$) in its ground state. How can you say that it is a transition element?
15. Explain why the melting point of Cr is the highest in the first series of transition elements?
16. Compounds of transition metals are colored. Give reasons.
17. Why the metals in second and third series of transition elements have greater enthalpies of atomization than the corresponding elements of the first series?
18. In the series of Sc to Zn, the enthalpy of atomization of Zn is lowest. Why?
19. The atomic sizes of Zn, Cd and Hg are more than the preceding elements of the respective transition series. Why?
20. Why do transition elements exhibit higher enthalpies of atomization?
21. The first ionization enthalpy of Cr is low .Give reason.
22. The second ionization enthalpy value of chromium and copper are high. Give reason.
23. The second ionization enthalpy value of zinc is low. Give reason.
24. The third ionization enthalpy value of manganese is high. Give reason.
25. The third ionization enthalpy value of zinc is high. Give reason.
26. hich of the 3d series of the transition metals exhibits the largest number of oxidation state and why?

27. Why do transition elements show variable oxidation state?

28. Why is the E^0 value of Cr^{+2}/Cr high?

29. Why is the E^0 value of Cu^{+2}/Cu is positive?

30. Account for the more negative E^0 value of Mn^{+2}/Mn and Zn^{+2}/Zn.

31. Why is the E^0 value of Sc^{+3}/ Sc^{+2} low?

32. Why is the E^0 value of Zn^{+3}/ Zn^{+2} high?

33. Why is the E^0 value of Mn^{+3}/Mn^{+2} high?

34. Why is the E^0 value of Fe^{+3}/ Fe^{+2} low?

35. What is the oxidation state of iron in chromite ore?

36. At what P^H does both chromate and dichromate ion exist in equilibrium.

THREE mark questions:

1. How do you account for the irregular variation of first ionization enthalpies in the first series of the transition series?
2. Why are the higher oxidation states of transition elements mostly satisfied by fluorine and oxygen?
3. Which is the stronger reducing agent Cr^{+2} or Fe^{+2} and why?
4. Write the electronic configuration of Cr and Cu. Explain.
5. Why do transition elements show magnetic properties?
6. Calculate the magnetic moment of $MnSO_4$?
7. $ScCl_3$ is colorless. Why?
8. $ZnCl_2$ is colorless. Why?
9. Why do transition elements form complex compounds?
10. Why do transition elements exhibit catalytic properties?
11. Why do transition elements form interstitial compounds?
12. Why do transition elements form alloys easily?
13. What are interstitial compounds? Give examples.
14. Draw the structure of chromate ion and dichromate ion.
15. How does acidified potassium dichromate react with potassium iodide solution?
16. How does acidified potassium dichromate react with Hydrogen sulphide?
17. Draw the structures of manganate ion and permanganate ion.
18. How does acidified potassium permanganate react with ferrous sulphate solution?
19. How does acidified potassium permanganate react with oxalic acid solution?
20. How does acidified potassium permanganate react with sodium sulphite solution?
21. How does acidified potassium permanganate react with sodium nitrite solution?

22. How does acidified potassium permanganate react with Hydrogen sulphide?

23. How does neutral potassium permanganate solution react with potassium iodide solution?

24. How does neutral potassium permanganate solution react with sodium thiosulphate solution?

25. How does neutral potassium permanganate solution react with manganous sulphate solution?

26. Mention two uses of potassium permanganate.

27. Permanganate titration should not be done in hydrochloric acid medium. Why?

28. The atomic radii of the third (5d) series are virtually the same as those of the corresponding members of the second (4d) series account. **OR** second and third transition series have similar radii.

29. Name the ore from which $K_2Cr_2O_7$ is manufactured. Give its composition.

30. Name the ore from which $KMnO_4$ is manufactured. Give its composition.

31. What is the effect of adding base to potassium dichromate ions? **OR** How does $K_2Cr_2O_7$ react with KOH? **OR** How do you convert dichromate ion to chromate ion?

32. What is the effect of adding acid to potassium chromate ions? **OR** How does K_2CrO_4 react with H_2SO_4? **OR** How do you convert chromate ion to dichromate ion?

33. Which of the following are coloured Sc^{3+}, V^{2+}, Mn^{2+}, Cu^{+}, Ni^{2+}?

34. Calculate the magnetic moment of the following Sc^{3+}, V^{2+}, Mn^{2+}, Cu^{+}, Ni^{2+}?

35. How is potassium dichromate manufactured?

36. Give any two methods of preparation of potassium permanganate.

37. Complete the following reactions:

a) $Fe^{2+} + MnO_4^- + H^+ \longrightarrow$

b) $NO_2^- + MnO_4^- + H^+ \longrightarrow$

c) $MnO_4^- + H_2O + I^- \longrightarrow$

d) $MnO_4^- + S_2O_8^{2-} + H_2O \longrightarrow$

e) $Cr_2O_7^{2-} + H^+ + Fe^{2+} \longrightarrow$

f) $Cr_2O_7^{2-} + Sn^{2+} + H^+ \longrightarrow$

f- block elements

One mark questions:

1. Name the two series of f-block elements.

2. Which is the most stable oxidation state of lanthanide elements?

3. Name the member of the lanthanide series which is well known to exhibit +4 oxidation state.

4. What are pseudo transition elements? Why are they called so?

5. What are lanthanides? Why are they called so?

6. What are actinides? Why are they called so?
7. What is meant by Lanthanoid contraction? Why does it happen?
8. What is meant by actinoid contraction? Why does it happen?

THREE mark questions:

1. Ce^{+4} acts as an oxidizing agent. Why?
2. Eu^{+2} acts as a reducing agent. Why?
3. Actinide contraction is more predominant than lanthanide contraction. Why?
4. Mention some of the differences in properties of lanthanides and actinides.
5. What is mischmetal? What is its composition? What are its uses?