



Blue Print (As per PU Board)

Topic	1 mark questions	2 marks questions	3 marks questions	5 marks questions	Total Marks
The d & f Block Elements	-	1	2	-	7

One mark questions

1. Which element in the 3d series exhibits maximum oxidation state?

Answer: Mn

2. Arrange the following in increasing order of basic character: MnO, MnO_2, Mn_2O_7

Answer: $Mn_2O_7 < MnO_2 < MnO$

3. Arrange the following in increasing order of acidic character? CrO_3, CrO, Cr_2O_3

Answer: $CrO < Cr_2O_3 < CrO_3$. Higher the oxidation state, more will be the acidic character.

4. Out of Cu_2Cl_2 and $CuCl_2$, which is more stable?

Answer: $CuCl_2$ is more stable

Two marks questions

5. Give reasons: (i) Actinoids show variable oxidation states

(ii) Zr and Hf have almost identical radii.

Answer: (i) Due to comparable energies of 5f, 6d and 7s levels. (1 mark)

(ii) It is due to lanthanide contraction (1 mark)

6. What is lanthanide contraction? Write any one consequence of lanthanoid contraction.

Answer: Steady decrease in the size of lanthanides with increase in atomic number is known as lanthanoid contraction. (1 mark)

Radii of members of 3rd transition series are very much similar to corresponding members of 2nd series. (1 mark)

7. Give reason: "Transition metals generally form colored compounds.

Answer: When a visible light falls on the metal ion or compound, the unpaired electron of d-subshell jumps from lower energy to higher energy by absorbing light of particular wavelength therefore the unabsorbed light is transmitted as complementary colour. (2 marks)

8. (a) Write the general electronic configuration of Actinoids.

(b) What is Actinoid contraction?

Answer: (a) $[Rn]5f^{1-14}6d^{0-1}7s^2$ (1 mark)

(b) The gradual decrease in atomic and ionic sizes along the actinoid series is known as Actinoid contraction. (1 mark)

Three marks questions

9. Name the metal of the 1st row transition series that

(i) Has maximum number of unpaired electrons in its ground state.

(ii) Has zero spin only magnetic moment in its + 2 oxidation state.

(iii) Exhibits maximum number of oxidation states.

Answer: (i) Chromium (1 mark)

(ii) Zinc (1 mark)

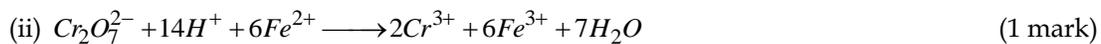
(iii) Manganese (1 mark)

10. Write ionic equations for the reaction of dichromate ions with

(i) Hydroxyl ions

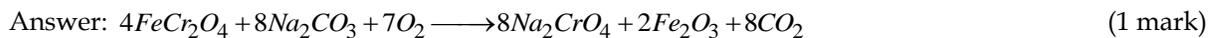
(ii) Fe^{2+} ions in acidic medium (iii) In which one of the above two reactions will oxidation number of chromium remains unchanged.

Answer: (i) $Cr_2O_7^{2-} + 2OH^- \longrightarrow 2CrO_4^{2-} + H_2O$ (1 mark)



(iii) In reaction (i) (1 mark)

11. Write the equations involved in the preparation of potassium dichromate from chromite ore.



12. What is Misch metal? What is its composition? What are its uses?

Answer: It is an alloy of lanthanoids. (1 mark)

50 % lanthanum 45 % Cerium. 5 % iron and trace amounts of carbon, sulphur, aluminium & calcium. (1 mark)

It is used for making bullets and shots. (1 mark)