

**CHOITHRAM SCHOOL MANIKBAGH INDORE**

**CLASS XII Session: 2018-19**

**Subject: Chemistry**  
**Allotment Date: 06/07/18**

**Assignment No: II**  
**Submission Date: 15/07/18**

S.No	QUESTION	MARKS	LEVEL
<b>OBJECTIVE TYPE</b>			
1.	What would happen when pH of an aqueous solution of dichromate ion is raised?	1	Knowledge
2.	$E^0$ for $Mn^{3+}/Mn^{2+}$ couple is more positive than that for $Fe^{3+}/Fe^{2+}$ . Why?	1	Understanding
3.	Atomic radius of copper is greater than that of Cr but ionic radius of $Cr^{2+}$ is greater than that of $Cu^{2+}$ . Why?	1	hot
<b>SHORT ANSWER TYPE I</b>			
4.	What is lanthanoid contraction? Explain the cause and consequences of it.	2	knowledge
5.	Explain, Why? i) Zirconium and Hafnium exhibit similar properties. ii) $Mn^{2+}$ shows maximum paramagnetic character amongst the +2 ions of I transition series. iii) The second and third transition series elements have almost similar atomic radii. iv) Transition metals form a number of interstitial compounds.	2	understanding
6.	The $E^0$ values in respect of electrodes of Cr (24), Mn (25) and Fe (26) are $Cr^{3+}/Cr^{2+} = -0.4$ V; $Mn^{3+}/Mn^{2+} = +1.5$ V; and $Fe^{3+}/Fe^{2+} = +0.8$ V. On the basis of the above information compare the feasibilities of further oxidation of their +2 oxidation state.	2	logic
7.	Give examples and suggest reasons for the following features of the transition metal chemistry : i) The lowest oxide of transition metal is basic , the highest is amphoteric/acidic. ii) A transition metal exhibits highest oxidation state in oxides and fluorides. iii) The highest oxidation state is exhibited in oxoanions of a metal.	2	Hot
<b>SHORT ANSWER TYPE II</b>			
8.	Account for the following characteristics of a d block element: (i) Complex Formation (ii) High enthalpies of atomisation (iii) Variable oxidation states (iv) Magnetic Behaviour (v) Formation of coloured compounds (vi) Alloy Formation	3	understanding
9.	a) Predict which of the following will be coloured in aqueous solution ? $Ti^{3+}, V^{3+}, Cu^+, Sc^{3+}, Mn^{2+}, Fe^{3+}$ and $Co^{2+}$ b) Calculate the 'spin only' magnetic moment of $M^{2+}(aq)$ ion ( $Z = 27$ ). c) Chromium is a typical hard metal while mercury is a liquid. Why?	3	Multi conceptual
10.	The sum of the first and second ionization enthalpies and third and fourth ionization enthalpies of nickel and platinum are : $IE_1 + IE_2(KJ/mol)$ $IE_3 + IE_4(KJ/mol)$ Ni                      2.49                                      8.80  Pt                      2.66                                      6.70 Based on the above information , answer the following : a) Which is the most common oxidation state of Ni and Pt? Why? b) Out of the two, name the metal which can easily form compounds in +4 oxidation state and why ?	3	Analysis
<b>LONG ANSWER TYPE</b>			
11.	Account for the following statements : i) The melting and boiling points of Zn , Cd and Hg are low. ii) $Cu^+$ ion is not stable in aqueous solutions. iii) Scandium does not form coloured ions. iv) Silver has completely filled d-orbital ( $4d^{10}$ ) in its ground state , still it is considered a transition element. v) Cobalt(II) is stable in aqueous solution but in the presence of complexing reagents it is easily oxidized.	5	Logic
12.	a) A bluish brown coloured solid 'A' when fused with an alkali metal hydroxide in the presence of air produces a dark green coloured compound 'B' which upon electrolytic oxidation in alkaline medium gives a dark purple coloured compound 'C'. Identify A, B, C and write the reactions involved. b) What happens when acidic solution of green compound 'B' is allowed to stand for some time? Write the equations involved .What is this type of reaction called?	5	Hot