UG part I (HONS) + (subs)

First Transition Series

1. Give the characteristic properties of transition metal ion.
2. Why Fe^{2+} behaves as reducing agent?
3. The metals of second transition element series show higher oxidation states than the metals of first transition series. Give reason!
4. Discuss the different oxidation states of Cr and their stability.
5. Discuss the chemistry of first transition series with reference to (i) Atomic size (ii) Magnetic behaviour (iii) Oxidation state
6. Give a comparative account of following characteristic of first transition series metal ions with second series.
   i) Ionic radii (ii) Stability of oxidation state
   iii) Complex-forming tendencies and stereochemistry (4 & 6)
7. Write the magnetic properties and complex formation properties of d-block elements.
8. Write electronic configuration of Fe^{2+}, Cr^{3+} ion.
9. The general electronic configuration of transition element is
   a) $(n-1)d^{1-5}$ b) $(n-1)d^{1-10}ns^1$
   c) $(n-1)d^{1-10}ns^{1-2}$ d) $ns^2(n-1)d^{10}$

10. Highest (+7) oxidation state is shown by
a) Co b) Cr c) V d) Mn

11. Mercury is the only metal which is liquid at 0°c. This is due to its
a) Very high ionisation energy and weak metallic bond.
b) Low ionisation potential.
c) High atomic weight
d) High Vapour pressure

12. A transition element X has a configuration [Ar] $3d^4$ in its +3 oxidation state. Its atomic number is
a) 25 b) 26 c) 22 d) 19

13. Which of the following ionic species will impart colour to an aqueous solution.
a) Ti^{4+} b) Cu^+ c) Zn^{2+} d) Cr^{3+}

14. The aqueous soln containing which one of the following ions will be colourless.
a) Sc^{3+} b) Fe^{2+} c) Ti^{3+} d) Mn^{2+}

15. Sc (Z=21) is a transition element but Zn^{2+} (Z=30) is not because.
a) Both Sc^{3+} and Zn^{2+} ions are colourless and form white compounds.
b) In case of Sc, 3d orbitals are partially filled but in case of Zn it is full filled.
c) Last electron is assumed to added to 4s level in case of Zn
d) Both Sc and Zn do not exhibit variable oxidation state.