M 8540

Reg. No. : .....

Name : .....

IV Semester B.Sc. Degree (CCSS-Reg./Supple./Imp.) Examination, May 2015

CORE COURSE IN CHEMISTRY

4B 06 CHE : Inorganic Chemistry – II

Time : 3 Hours

Max. Weightage : 25

SECTION – A

(Answer **all** questions. **Each** bunch of **four** questions carries **a** weightage of **1**.)

Choose the correct answer :

1. i) Cinnabar is an ore of
   a) Pb
   b) Hg
   c) Zn
   d) Cu

   ii) Among the following reaction which one is an example of smelting
   a) $CaCO_3 \xrightarrow{\Delta} CaO + CO_2$
   b) $ZnS + 3O_2 \longrightarrow 2ZnO + 2SO_2$
   c) $SiO_2 + CaO \longrightarrow CaSiO_3$
   d) $4\,FeS_2 + 11O_2(2) \longrightarrow 2\,Fe_2O_3 + 8\,SO_2$

   iii) Excessive intake of iron causes
   a) Siderosis
   b) Hypertension
   c) Fatigue
   d) Palpitation

   iv) CrO_3 is bright orange in colour. The colour is due to
   a) d-d transition
   b) f-f transition
   c) charge transfer
   d) its basic nature

P.T.O.

2. i) _____ is an example of diamagnetic compound.
   a) Cu^{2+} b) Cr^{3+} c) Ti^{3+} d) None of these
   ii) Which of the following is likely to form white salts ?
   a) Sc^{3+} b) Ti^{3+} c) Cu^{2+} d) Fe^{3+}
   iii) Highest magnetic moment is shown by _____ ions.
   a) Zn^{2+} b) Ti^{3+} c) Mn^{2+} d) Sc^{3+}
   iv) The most stable ion is
   a) Mn^{2+} b) Mn^{3+} c) Sc^{4+} d) Fe^{2+}

3. i) The catalyst used in the hydrogenation of oil is
   a) Fe b) Ni c) Cu d) Pd
   ii) If a compound absorbs violet colour from visible light, then the observed colour is
   a) red b) blue c) yellow d) none of these
   iii) _____ is the richest source of rare earth.
   a) Calamine b) Mischmetal
   c) Cinnabar d) Monozite
   iv) The stable +2 ions of lanthanides in aqueous solution are
   a) Yb^{2+} b) Eu^{2+} c) both d) none

4. i) Which of the following involve gradual filling of 5f level ?
   a) Transition elements b) Lanthanides
   c) Actinides d) Rare gases
   ii) Complete the reaction $B_2H_6 \xrightarrow[298\ k]{Cl_2} ?$
   a) B_2H_5Cl b) BCl_3
   c) Borazole d) Higher hydrides
   iii) The formula $(SiO_3)^{2n-}$ represent _____ silicates.
   a) Ortho b) Pyro c) Cyclic d) Chain
   iv) _____ is used for making optical instruments.
   a) Soft glass b) Hard glass
   c) Borosilicate glass d) Lead glass **(Weightage 4×1=4)**

SECTION – B

(Answer **any 5** questions. **Each** carries **a** weightage **1**.)

5. What is the principle of hydrometallurgy ? Give an example.
6. Point out the criteria of selection of good reducing agent for the extraction of metals.
7. Transition elements have high value of standard oxidation potential, but they are poor reducing agents. Give reason.
8. In contact process, why does V_2O_5 act as a catalyst ?
9. What would be the name and symbol for the element with atomic number 118 ?
10. List four uses of actinides.
11. $La(OH)_3$ is a stronger base than $Lu(OH)_3$. Give reason.
12. Why thiocyanogen is considered as a pseudohalogen ? **(Weightage 5×1=5)**

SECTION – C

(Answer **any 4** questions. **Each** carries a weightage of **2**.)

13. Explain electrometallurgy with an example.
14. Discuss the role of Na-K pump in metal ion transport.
15. Describe the formation of non-stoichiometric compounds by transition elements.
16. Briefly explain the electronic spectra of first row transition series with reference to d^1 and d^9 systems.
17. Write the properties and applications of silicones.
18. Discuss the role of water during setting of cement. Name one unit in Kerala and where is it located. **(Weightage 4×2=8)**

SECTION – D

(Answer **any two** questions. **Each** question carries a weightage of **4**.)

19. Make a comparative study of 3d, 4d and 5d transition series.
20. Compare the properties of lanthanides and actinides.
21. a) Discuss metallo enzymes of zinc.
    b) Give the preparation and structure of $HClO_2$. **(Weightage 2×4=8)**

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