



TEST PAPER: CHEMISTRY

Time: 80 Minutes

Class: 12th J.E.E.

Max. Marks: 40 Marks

Date: 5th September, 2018

Marking Scheme: Questions carry 10 marks each. Questions have 3 subparts each. Subparts (a) and (b) carry 3 marks each and subpart (c) carries 4 marks.

Question 1:

- A. i. What is a ligand? Give an example of a bidentate ligand.
ii. Define crystal field splitting energy.
- B. Write the chemical reactions which take place in the following operations:
a) Electrolytic reduction of Al_2O_3 .
b) Isolation of Zn from zinc blende.
c) Mond's process for refining of Ni.
- C. a) Name the method used for the refining of titanium.
b) What is the role of Zn in the extraction of silver?
c) Reduction of metal oxide to metal becomes easier if the metal obtained is in liquid state. Why?

Question 2:

- A. i. Out of C and CO, which is a better reducing agent at 673 K?
ii. Describe the role of
a) Iodine in the refining of titanium.
b) Collector in the froth floatation process.
- B. Describe how Zinc oxide is converted to zinc metal.
- C. Differentiate between
a) Calcination and roasting
b) Electrolytic reduction and electrolytic refining

Question 4:

- A. Describe the preparation of Potassium dichromate from sodium chromate
- B. Describe the preparation of $KMnO_4$ from K_2MnO_4
- C. i. Why do most of the transition metal ions exhibit characteristic colour in aqueous solution?
ii. Explain with equations, how the colour of a solution of $K_2Cr_2O_7$ depends on pH.

Question 4:

- A. For the complex $[Fe(CO)_5]$, write the hybridization, magnetic character and spin of the complex. (At. Number: Fe = 26)
- B. Give reasons:
a) Copper matte is put in silica lined convertor.
b) Cryolite is added to alumina during electrolytic reduction.
c) Pine oil is used in the froth floatation process
- C. i. Differentiate between flux and slag
ii. Give reason: The third ionization enthalpy of manganese ($Z = 25$) is exceptionally high.