* S B - 3 5 0 6 / 1 0 0 *

SB-3506

M. Sc. (Part - II) Examination

March / April – 2011

Inorganic Chemistry : Paper - II

Time : **3** Hours] [Total Marks : **70**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ M. SC. (PART - II)

Name of the Subject :

☛ INORGANIC CHEMISTRY : PAPER - II

☛ Subject Code No. : 3 5 0 6 ☛ Section No. (1, 2,.....) : Nil

Seat No. :

Student's Signature

(2) Answer **all** questions.

(3) Figures to the **right** hand side of each question indicate full marks.

(4) Give neat and clean diagram whenever applicable.

1 (a) Enumerate components of oil refinery waste water. **12**
Write notes on spent caustic with reference to oil refinery - waste-water.

(b) What are particulates ? Name the particulate pollutant's which are commonly present in the atmosphere. What are the sources of these particulates ? Discuss the toxic effects of particulates.

(c) Answer in brief :

(i) Toxic effects of heavy metals.

(ii) Depletion of ozone layer.

OR

1 (a) What do you understand by 'smog' ? What is **12**
photochemical smog ? Give reactions leading to formation of photochemical smog.

(b) What are the chemical impurities present in water ? Give a method of remove fluoride ions from polluted water.

(c) What is break point chlorination ? Discuss in brief the methods employed for treatment of water sample containing iron and manganese.

2 (a) Explain : **12**

(i) Bacterial iron transfer

(ii) Rubedoxin as electron transfer protein.

(b) How is iron transported and stored in human being ?

(c) What is "Blue-blood" ? Name the metalloenzymes having Cu (II) and Cu (I) metal ions. Write biological functions and toxic effects of copper on living beings.

OR

2 (a) Discuss the nature of heam-dioxygen binding in biological systems. **12**

(b) What are heamoglobin and metamyoglobin ? Explain their role in supplying oxygen in higher animals.

(c) Name the factors which affect the dissociation of oxyheamoglobin.

3 (a) What do you understand by **12**

(i) Terra-Cotta and

(ii) Spalling in ceramics.

(b) Define the term refractory. How will you classify refractories ? Name the compoudns which can be considered as superrefractories.

(c) Write notes on :

(i) Carborundum

(ii) High alumina.

OR

3 (a) Define glass physically as well as chemically. Write reactions involved during formation of glass. **12**

(b) Explain the following :

(i) Slip casting

(ii) Refractoriness

(iii) Plastic limit of clay.

(c) What are enamels ? Name raw materials used in manufacture of enamels. Give different uses of enamels.

4 (a) What do you mean by mixed fertilizers ? Discuss chemical reactions which can take place with the use of mixed fertilizers. **12**

(b) What are major and minor elements useful to plant growth ? Give sources and effect of iron and copper deficiencies in plants.

(c) Describe different phosphatic fertilizers used in agricultural practice.

OR

4 (a) Explain the following : **12**

(i) Fertilizers grade and ratio.

(ii) Fillers and conditioners with reference to fertilizers.

(b) What is ammoniation ? Discuss ammoniation of superphosphates.

(c) Give the name of elements used as micronutrients. What are the functions that can be performed by micronutrients ?

5 (a) Give the principle of thermogravimetric analysis and explain working of TGA. **12**

(b) Give the classification of chromatography. Explain the principle of gas chromatography.

(c) Give the diagram of G.C. and explain sample injection system.

OR

5 (a) Show how atomic absorption spectroscopy (AAS) is used in the determination of Ca, Mg, Na and K in blood serum. What are the disadvantages of AAS ? **12**

(b) Give the application of TGA with suitable examples.

(c) Discuss influence of heating rate and furnace atmosphere on thermogravimetric curves.

6 (a) Explain electrochemical theory of corrosion giving suitable example. **10**

(b) What is meant by metallic corrosion ? Discuss critically corrosion of zinc in HCl solution.

(c) What is pitting ? Discuss in brief shape, growth and autocatalytic nature of pitting.

OR

6 (a) Discuss mechanism and prevention of dizincification of brass in acidic solution. **10**

(b) What is meant by corrosion rate ? How it can be expressed in different manners ? Show limitations of them.

(c) What is metallic corrosion ? How it differs from erosion ? Show corrosion can lead to many difficulties.
