TDC Even Semester Exam., 2019

CHEMISTRY

(Honours)

(6th Semester)

Course No. : CHMH–601

(Inorganic Chemistry)

Full Marks : 35
Pass Marks : 12

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, taking **one** from each Unit

UNIT—I

1. What do you mean by intermetallic compounds? Discuss Hume-Rothery rules for intermetallic compounds. Explain the phase diagram of Cu-Zn system. 2+2+3=7

2. *(a)* What are alloys? Outline the factors for the formation of interstitial and substitutional alloys. Explain the formation of substitutional alloy citing a suitable pair of metals. 1+2+2=5

(b) State the difference between substitutional solid solution and interstitial solid solution. 2

UNIT—II

3. *(a)* Explain how oxides of nitrogen and chlorofluorocarbons disturb the balance of formation and destruction of ozone in the stratosphere. What are the adverse effects of thinning out of ozone layer? 3+1=4

(b) What is the effect of the presence of arsenic in drinking water? 2

(c) What is the BOD (biochemical oxygen demand) value of pure water. 1

4. *(a)* What are detergents? How do they cause water pollution? 1+2=3

(b) Cite a few reasons for the pollution of soil. Discuss three measures that may be taken to prevent soil pollution. 1½+1½=3

(c) Explain the term COD (chemical oxygen demand) to describe the pollution level of water. 1

UNIT—III

5. *(a)* Explain that a molecule belonging to C_i point group can not be polar. 2

(b) Define symmetry operations and symmetry elements. Assign the point groups of *cis*-, *trans*- and average gauche form of H_2O_2. 2+3=5

6. *(a)* What do you mean by *n*-fold proper axis of rotation of a molecule? Show how the operation is carried out for NH_3 molecule. 1+2=3

(b) Give an example of a molecule belonging to C_s point group. 1

(c) Can a molecule with C_1 point group be chiral? Justify your answer with a suitable example. 3

UNIT—IV

7. *(a)* What is atomic absorption spectroscopy (AAS)? Describe how you can determine the amount of magnesium in tap water by AAS. 2+3=5

(b) Why is atomic absorption spectroscopy (AAS) preferable to atomic emission spectroscopy (AES)? 2

8. Finish the principle and applications of cyclic voltametry. 4+3=7

UNIT—V

9. *(a)* Name two hemeproteins and explain their biological functions. 4

(b) Give one example for each of a coordination compound as an anti-arthritic, anti-cancer and anti-heavy metal drugs. 1+1+1=3

10. *(a)* Discuss about the structures of chlorophyll and vitamin B_{12} with reference to porphyrin. 2+2=4

(b) Explain the biological functions of Mg^{2} and Ca^{2} in metabolism. 3

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