Third Year B. Sc. (Sem. VI) (CBCS) Examination

March - 2019

Chemistry : C - 601

(Inorganic Chemistry & Industrial Chemistry)

(New Course)

Faculty Code : 003
Subject Code : 1016006

Time : $2\frac{1}{2}$ Hours]   [Total Marks : **70**

Instructions :

    (1)   All the questions are compulsory.

    (2)   All the questions carry equal marks, 14 marks each.

1   (a)   Answer the following questions :   **4**

         (1)   Define multi electron system.

         (2)   What is S-S coupling ?

         (3)   What is Pigeon hole diagram ?

         (4)   Give the formula to calculate microstate.

    (b)   Answer any one of the following questions :   **2**

         (1)   Explain Spin multiplicity.

         (2)   Explain Russell-Saunders coupling.

    (c)   Answer any one of the following questions :   **3**

         (1)   Explain the Hund's rule to determine ground state spectral term.

         (2)   Calculate the spectral term for d^2 case & ground state spectral terms.

(d) Answer any one of the following questions : **5**

 (1) Calculate the microstates for d^2 electronic configuration.

 (2) Discuss the *l-l* coupling in p^2 case with vector diagram.

2 (a) Answer the following questions : **4**

 (1) Define Hole formalism.

 (2) Draw the splitting of d orbitals in tetragonal complexes.

 (3) Which orbitals are not affected by the presence of ligand field ?

 (4) Define - Orbital allowed transition.

 (b) Answer any one of the following questions : **2**

 (1) Explain $\pi \to \pi^*$ charge transfer transition.

 (2) Explain spherical charge symmetric and charge asymmetric structure.

 (c) Answer any one of the following questions : **3**

 (1) Explain the splitting of d orbitals in square planner complexes.

 (2) What is orgel diagram. Draw the orgel diagram for D term.

 (d) Answer any one of the following questions : **5**

 (1) Discuss the John-Teller effect.

 (2) Discuss the absorption spectrum of Cu^{+2}.

3 (a) Answer the followings : **4**

 (1) Define magnetic field.

 (2) What is Larmor rotation ?

 (3) What is rancidity ?

 (4) Define - Winterization.

(b) Answer any one of the following questions : **2**

(1) Explain the characteristics of diamagnetism.

(2) Give the differences between oil & fats.

(c) Answer any one of the following questions : **3**

(1) Explain the effect of temperature on magnetism.

(2) Explain classification of oil.

(d) Answer any one of the following questions : **5**

(1) Discuss the Gouy balance method to measure magnetic susceptibility.

(2) Explain the analysis of oil using (i) Acid value & (ii) Saporification value.

4 (a) Answer the following questions : **4**

(1) What is environment ?

(2) Define pollution.

(3) What is the full form (name) of CCl_3F ?

(4) Define Exosphere.

(b) Answer any one of the following questions : **2**

(1) Explain photochemical smog.

(2) Explain biological pollution of water.

(c) Answer any one of the following questions : **3**

(1) Explain Acid Rain.

(2) Write Short note - BOD.

(d) Answer any one of the following questions : **5**

(1) Discuss in detail Green House effect.

(2) Discuss Ozone depletion with necessary reactions.

5 (a) Answer the following questions : **4**

    (1) Define Soap.

    (2) What is detergent ?

    (3) Give the importance of NaCl in soap manufacturing.

    (4) Which salts are useful to make Hard & Soft soap ?

  (b) Answer any one of the following questions : **2**

    (1) Explain the recovery of glycerine from spent lye.

    (2) Write about Shampoo manufacturing.

  (c) Answer any one of the following questions : **3**

    (1) Enlist the raw material for soap.

    (2) Give the comparision of soap and detergent.

  (d) Answer any one of the following questions : **5**

    (1) Discuss the continous process of soap manufacturing.

    (2) Discuss the classification of surfactants.

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