[4656] – 12

Seat No.	

F.E. (Semester – I) Examination, 2014
APPLIED SCIENCE – I
(Chemistry) (Old) (2008 Course)

Time : 2 Hours Max. Marks : 50

***Instructions** : 1) Solve Q.**1** or Q.**2**, Q.**3** or Q.**4** and Q.**5** or Q.**6**.*
*2) **Neat** diagrams must be drawn **wherever** necessary.*
*3) Black figures to the **right** indicate **full** marks.*
*4) **Use** of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is **allowed**.*
*5) Assume suitable data, if **necessary**.*

1. A) a) Define Axis of symmetry for crystal. Draw diagrams showing two-fold, three-fold and four-fold axes of symmetry for cubic crystals. **4**

   b) What is liquid crystal phase ? Give its applications. **3**

   B) Explain with appropriate figures co-ordination number and the number of atoms per unit cell in SC, BCC & FCC system. **6**

   C) Draw the following planes in a cubic system :
   i) [1 0 0]; ii) [1 1 2]; iii) [1 1 1] and iv) [0 2 0]. **4**

   OR

2. A) What is Atomic Packing Factor (APF) for crystals ? Calculate APF for FCC, BCC and SC system. **7**

   B) Explain structure, properties and applications of Fullerence. **6**

   C) Give difference in Schottky and Frenkel point defects in Ionic Crystals. **4**

3. A) Explain the titration curve for the titration of acetic acid and sodium hydroxide. Suggest the suitable indicator for this titration and give formulae to calculate pH at different stages of titration. (Assume sodium hydroxide solution in burette) **7**

   B) Explain Ostwald's theory of pH indicator. **6**

   C) Define :
   i) Normality ii) Molarity
   iii) Titrant and iv) Standard-solution. **4**

   OR

4. A) What is meant by precipitation titration ? Explain Mohr's method for determination of Cl^- ions with chemical equations, procedure and calculation. **7**

   B) Calculate equivalent weight of KM_nO_4 in acidic, neutral and alkaline medium. (At. wt. : K = 39, M_n = 55, O = 16). **6**

   C) Define a primary standard. What are the conditions for a chemical to be the primary standard ? **4**

P.T.O.

5. A) What is Vulcanization of rubber ? Give structural changes taking place on Vulcanization. State properties of rubber on Vulcanization. **6**

   B) Explain the mechanism of Free Radical Polymerization with suitable examples. **6**

   C) Write short note on Biodegradable Polymers. **4**

OR

6. A) What is glass transition temperature ? Give the factors affecting it. **6**

   B) Give preparation, properties and applications of **any two**

   I) HDPE II) SBR

   III) Polystyrene IV) Poly Vinyl Chloride. **6**

   C) What are polymer composites ? Give in brief their properties and applications. **4**

———————