



[4261] – 102

Seat No.	
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F.E. (Semester – I) Examination, 2012
APPLIED SCIENCE – I (Chemistry)
(2008 Pattern)

Time : 2 Hours

Max. Marks : 50

- Instructions:**
- 1) Answer **any 3** questions.
 - 2) **Neat** diagrams must be drawn **wherever** necessary.
 - 3) Black figures to the **right** indicate **full** marks.
 - 4) Your answers will be valued as a whole.
 - 5) **Use** of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is **allowed**.
 - 6) **Assume** suitable data, if necessary.

1. A) Define Wiess and Miller indices. Why Miller indices are superior to Wiess indices ? Explain your answer with suitable example. **7**
B) Show that the atomic packing factor for BCC is 0.68 and for FCC is 0.74. **6**
C) Draw the following planes in a cubic system. **4**
i) [100] ii) [112] iii) [111] iv) [020]

OR

2. A) Define lattice parameters, give the comparison between HCP and CCP with diagram and examples. **7**
B) Compare the FCC, BCC and SC unit cells with respect to coordination number, atomic radius and atoms per unit cells. **6**
C) X-ray of wavelength 0.68 \AA are diffracted by a Bragg's spectrometer at a glancing angle 15° in the first order. Calculate the interplanar spacing of the crystal. **4**
3. A) Solve the following :
i) Find the pH of the solution after adding 18 ml of 0.2 N KOH solution to 25ml of 0.1 N HCl in the titration.
ii) 20 ml of 10N HCl is mixed with 10ml of 36N H_2SO_4 and the mixture is made upto one litre with water. What is the normality of the mixture ? **6**
B) Explain Ostwald's theory of pH indicator. **6**

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- C) Calculate the weight of following substances will be required to prepare 250 ml of their decinormal solution 4
- i) H_2SO_4 ii) $C_2H_2O_4 \cdot 2H_2O$
iii) HCl iv) NaOH

OR

4. A) What is a complexometric titration ? Explain with suitable examples. 6
- B) Explain in detail the Volhards method for determination of chlorides in the given water sample. 6
- C) What are the characteristics of primary standard substances ? 4
5. A) What are plastics ? How they are classified ? Explain in brief different ingredients used in plastics. 7
- B) Define and explain with suitable example : 6
- i) Functionality ii) Degree of polymerization
iii) Co-polymer iv) Thermosetting polymer
- C) Give a brief account of conducting polymers. 4

OR

6. A) Explain the mechanism of free radical chain polymerization with suitable examples. 7
- B) Give preparation, properties and application of (**any two**). 6
- i) HDPE ii) SBR
iii) Polystyrene iv) Polypropylene
- C) Give classification of polymer on following basis : 4
- i) Type of monomer
ii) Backbone composition.