

Total No. of Questions : 12]

[Total No. of Printed Pages : 4

[3661]-102

F. E. (Semester - I) Examination - 2009

APPLIED SCIENCE - I

(June 2008 Pattern)

Time : 3 Hours]

[Max. Marks : 100

Instructions :

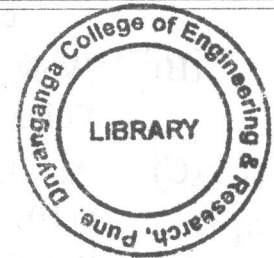
- (1) Answer **any three** questions from each section.
- (2) Answers to the **two sections** should be written in **separate answer-books**.
- (3) Black figures to the right indicate full marks.
- (4) Neat diagrams must be drawn wherever necessary.
- (5) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.
- (6) Assume suitable data, if necessary.

Constants :  $h = 6.63 \times 10^{-34}$  J.sec.

$m = 9.1 \times 10^{-31}$  kg.

$e = 1.6 \times 10^{-19}$  C

$c = 3 \times 10^8$  m/sec.



SECTION - I

- Q.1) (A) Define and explain the Vulcanization of Natural Rubber. [06]
- (B) Classify the Polymer on the basis of Heat Effect and Number Monomers. [06]
- (C) Write short note on Biodegradable Polymer. [05]

OR

- Q.2) (A) Explain the Compounding of Polymer. [06]
- (B) Give the polymerization reaction, properties and applications of any two : [06]
- (1) Polystyrene
  - (2) PF Resin
  - (3) Silicon Rubber
  - (4) ABS Plastic
- (C) Give the difference between Addition Polymerization Reaction and Condensation Polymerization Reaction. [05]

- Q.3)** (A) What are the types of Symmetries in Crystal ? Discuss them with respect to Cubic Crystal. [06]
- (B) Define the following terms : [06]
- (1) Unit Cell
  - (2) Anisotropy
  - (3) Co-ordination Number
  - (4) Radius Ratio
- (C) (1) Calculate APF for BCC. [03]
- (2) Draw the following planes in simple Cubic System :  
(111) and (110) [02]

**OR**

- Q.4)** (A) (1) Explain the structure and properties of Fullerene. [04]
- (2) Give the Structure of Polypyrrole and justify its conducting nature. [03]

(B) What is Point Defect ? What are their types and explain the Point Defect in Ionic Crystal. [06]

(C) At what glancing angle, would the first order diffraction from (110) plane of KCl can be observed by using X-ray of wavelength  $0.715 \text{ \AA}$ . The Unit Cell dimension is  $3.1 \text{ \AA}$ . [04]

**Q.5)** (A) How are the pH of titration mixture calculated at various stages during weak acid - strong base ? [06]

(B) Define : [06]

- (1) Normality
- (2) Molarity
- (3) Equivalence Point
- (4) Primary Standard
- (5) Indicator
- (6) End Point

(C) Calculate the equivalent weight of  $\text{K}_2\text{Cr}_2\text{O}_7$  and  $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ .  
(Given Mole wt.  $\text{K}_2\text{Cr}_2\text{O}_7 = 294$  and  $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O} = 248$ ) [04]

**OR**

