

Sem - I

NOV - DEC 2008 F.E. (New Syllabus)

(SET - 1)

Total No. of Questions : 12]

[Total No. of Printed Pages : 4

[3461]-102

F. E. (2008 Course) Examination - 2008

APPLIED SCIENCE - I

Time : 3 Hours]

[Max. Marks : 100

Instructions :

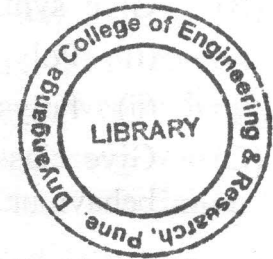
- (1) Answer 3 questions from section I and 3 questions from section II.
- (2) Answers to the two sections should be written in separate books.
- (3) Black figures to the right indicate full marks.
- (4) Neat diagrams must be drawn wherever necessary.
- (5) Use of logarithmic tables, slide rule, Mollier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

SECTION - I

- Q.1) (A) What is Crystal Defect ? How does it arise ? Explain effect of point defect and line defect on properties of crystals. [06]
- (B) Explain in brief Organic Electrical Conductors : [06]
- (i) Conducting Polymers
 - (ii) Charge Transfer Compounds
- (C) State and explain Bragg's Law. [04]

OR

- Q.2) (A) Explain basic structure, properties and applications of Fullerenes. [06]
- (B) For BCC iron compare (i) the interplaner spacing and (ii) diffraction angle for the (220) set of planes. The lattice parameter for Fe is 0.2866 (2.886 Å). Also assume that monochromatic light having a wavelength of 0.1790 nm (1.790 Å) is used, and order of reflection is 1 (one). [06]
- (C) Draw (110) and (111) plane in simple cubic unit cell. [04]



- Q.3) (A) What is meant by Precipitation Titration ? Explain Mohr's method for determination of Cl^- ions. [07]
- (B) Explain Titration curve for 0.1 N HCl and 0.1N NaOH. Which indicator can be used for this titration ? [06]
- (C) Balance following equations : [04]
- (i) $\text{H}_2\text{O}_2 + \text{MnO}_4^- \rightarrow \text{O}_2 + \text{Mn}^{2+}$
- (ii) $\text{PbS} + \text{H}_2\text{O}_2 \rightarrow \text{PbSO}_4$

OR

- Q.4) (A) What is Iodometry ? Explain how the percentage of copper in brass can be determined by using iodometry ? [07]
- (B) Attempt following : [06]
- (i) How many milliliters of concentrated sulphuric acid, 94% (g/100g solution) of density 1.831 g/cm^3 are required to prepare 1 litre of a 0.1 M solution ?
- (ii) One rupee silver coin weighing 2.75g was dissolved in acid and then diluted to 250 ml. with distilled water. 25 ml from this was titrated with 0.12M NH_4CNS . The end point was 16 ml. Calculate percentage of silver in the coin. (Given At. wt. of Ag = 107.88)
- (C) What is meant by Standard Solution ? How is it prepared ? [04]

- Q.5) (A) Why vulcanisation of rubber is necessary ? Explain use of sulphur and benzoyl peroxide for this purpose. [07]
- (B) Give synthesis, properties and applications of : [06]
- (i) Polypropylene
- (ii) Polystyrene
- (C) Give classification of Polymers on the basis of their thermal behaviour. [04]

OR

- Q.6) (A) Why recycling of plastics is necessary ? Explain recycling of any two plastics. [07]
- (B) Give reasons : [06]
- (i) Polymers take long time for dissolution.
- (ii) We consider average value for molecular weight of polymer.
- (C) Explain the factors which increase thermal stability of polymers with suitable example. [04]

