2008 COCHIN UNIVERSITY OF SCIENCE & TECHNOLOGY

ANSWER ANY SIX QUESTION
ALL QUESTIONS CARRY EQUAL MARKS
MARK [6*15]

1a. What are the various types of conductor materials? Give an application of each with its properties

b. Explain the terms relaxation time, collision time and mean free path as applied to conduction phenomenon

c. Explain the zone refining purification process of semiconductor materials

2a. Discuss the properties and specifications of wire and cable materials

b. Discuss the major drawbacks of classical free electron theory. How these drawbacks are eliminated in quantum approach

c. Explain any one method employed for fabricating PN junction

3a. Differentiate the different mechanisms of polarization in dielectrics

b. Derive Clausiees-Mossotti relation in dielectrics

c. Compare ferroelectricity and ferromagnetism

4a. What is loss tangent? What is its significance?

b. Prove that absorption of energy is proportional to the imaginary part of the complex dielectric constant

c. Derive the relation between polarisation P and external electric field E

5a. Explain the breakdown mechanisms in gases and liquids

b. Discuss the electrical, mechanical and thermal properties of insulating materials

6a. Describe how insulating materials are classified on the basis of temperature. Give examples of each

b. Mention properties and applications of the following insulating materials

i) Glass ii) PVC iii) Asbestos iv) Teflon v) Bakelite

7a. Discuss Langevin's theory of paramagnetism and diamagnetism

b. Classify the magnetic materials on the basis of dipole moment and explain their properties

8a. Distinguish between hard and soft magnetic materials. List a few materials under each category and give their applications

b. What are the factors affecting permeability and hysterisis loss

9a. Differentiate photo thermal and photo voltaic conversion process

b. List the important properties and aplications of superconductors

10a.Discuss the properties of fuse materials. How the rating of fuse is fixed?

b. What is a solar cell? List the important characteristic of solar cell