

## B. Tech Degree V Semester Examination, November 2009

### EE 504 ELECTRICAL MATERIAL SCIENCE (2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

#### PART - A

(Answer ALL questions)

(8 x 5 = 40)

- I. (a) Explain how the conductivity of conducting materials vary with temperature and composition.  
(b) With neat diagram, discuss about hysteresis curve.  
(c) Explain the behaviour of dielectrics in alternating fields.  
(d) Explain briefly the ageing of insulators.  
(e) Explain about heat mirror coating.  
(f) List out some alloys for switch contacts.  
(g) What is photoelectron spectroscopy? Explain.  
(h) Explain briefly ferromagnetic resonance.

#### PART - B

(4 x 15 = 60)

- II. (a) Explain the Zone – refining technique for the preparation of semiconductor materials. (7)  
(b) Write notes on (i) ferromagnetism (ii) organic semiconductor. (8)
- OR
- III. (a) Explain Fermi – Dirac distribution. (7)  
(b) Write notes on :  
(i) hard and soft magnetic materials  
(ii) amorphous semiconductor (8)
- IV. (a) Discuss the factors influencing dielectric strength. (7)  
(b) Discuss the electronic, ionic and dipolar polarizations of dielectrics. (8)
- OR
- V. (a) What are the different types of insulating materials? Explain with examples. (7)  
(b) Explain the mechanism of breakdown in gases, liquids and solids. (8)
- VI. Explain -  
(i) Solar selective coating  
(ii) Antireflection coating  
(iii) Cold mirror coating. (15)
- OR
- VII. Discuss about materials for  
(i) Solar cells  
(ii) Fuel cells  
(iii) Battery. (15)
- VIII. (a) Explain optical microscopy. (8)  
(b) Discuss about the electron spin resonance. (7)
- OR
- IX. (a) Explain atomic absorption spectroscopy. (8)  
(b) Discuss about nuclear magnetic resonance. (7)

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