C 59294 (Pages : 2) Name.....

Reg. No.....

FIFTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, JUNE 2009

EE 04 506 – ELECTRICAL ENGINEERING MATERIAL SCIENCE

(2004 Admissions)

Time : Three Hours Maximum : 100 Marks

I. (a) Explain amorphous and organic semiconductors.

(b) Define rated current and fusing current.

(c) Write short notes on various organic materials.

(d) Write short notes on dipolar relaxation.

(e) State magnetic and electron spin resonance.

(f) Discuss the properties of mica as a dielectric.

(g) Explain Photothermal conversion.

(h) Explain Nuclear magnetic Resonance.

(8 × 5 = 40 marks)

II. (a) Explain the various magnetic materials used in electrical machines, instruments and relays. (15 marks)

Or

(b) (i) Explain the hard and soft magnetic materials used in various applications. (8 marks)

(ii) Explain the materials used for brushes of electrical machines, resistance, fuses and solders. (7 marks)

III. (a) Define hystersis loss and explain how it affects the selection of magnetic materials for electrical machines.

Or

(b) Explain Clausius-Mosotti relation. What is domain theory? (15 marks)

IV. (a) Explain various gaseous insulators with a neat diagram. (15 marks)

Or

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Turn over

(b) (i) Explain the mechanism of breakdown in gases, liquid and solids. (8 marks)

(ii) Explain the various factors influencing dielectric strength. (7 marks)

V. (a) Compare Silicon, Cadmium and Gallium Arsenide with reference to their semiconducting properties. (15 marks)

Or

(b) (i) Explain photothermal and photovoltaic conversion. (8 marks)

(ii) Explain Ferromagnetic resonance with a neat diagram. (7 marks)

[4 × 15 = 60 marks]