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10EE666

Sixth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Electrical Engineering Materials

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Explain the effect of temperature on resistance and hence desire an expression for temperature co-efficient of a resistance. **(08 Marks)**

b. Explain Fermi Cirac Distribtuion. **(06 Marks)**

c. Explain Briefly the uses of the following in electrical Industry
i) Silver ii) Copper iii) Tungsten **(06 Marks)**

2 a. Define and explain Hall effect? **(08 Marks)**

b. A mild steel ring having a cross sectional area of $5cm^2$ and a mean circumference of 40cm is wound with 200 turns. For an exciting current of 6.4A through the coil, the total flux produced was found to be 0.8 milli-webers.
Find : i) Flux density in wb/m^2 ii) Field intensity in AT/m
iii) Relative permeability of steel. **(06 Marks)**

c. Write the difference between hard and soft magnetic materials. **(06 Marks)**

3 a. Explain properties and applications of below materials.
i) Natural Rubber ii) Cotton iii) Synthetic rubber
iv) Wood v) Bakelite vi) Paper. **(12 Marks)**

b. Explain the following : i) Ionic polarization ii) Dispolar polarization. **(08 Marks)**

4 a. Explain the procedure for testing the dielectric strength of transformer oil. **(07 Marks)**

b. The capacitance of condenser formed of two metal sheets, each $100cm^2$ in area separated by dielectric 2mm thick is 0.0002μF. A potential difference of 20,000 volts is applied across condenser.
Calculate:
i) Charge m each plate and ii) Potential gradient in Kv/mm in the dielectric. **(06 Marks)**

c. Discuss in details about dipolar relaxation. **(07 Marks)**

PART – B

5 a. Explain with diagram: i) Flatbed plate collector ii) Concentrating collectors. **(10 Marks)**

b. Explain different semiconductor materials for solar cells. **(10 Marks)**

6 a. Explain in detail about atomic absorption spectroscopy. **(10 Marks)**

b. Explain pulsed Fourier transform NMR spectrometer, with a block diagram. **(10 Marks)**

7 a. Define Piezoelectricity? Explain the uses of any three Piezoelectric materials. **(10 Marks)**

b. Define ferromagnetic curie temperature. Explain properties of any tow ferromagnetic materials. **(10 Marks)**

8 a. What is ceramic? Explain in details the classification of ceramic capacitor? **(10 Marks)**

b. Explain the following: i) Thermoplastic ii) Thermostats iii) Rubber. **(10 Marks)**

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