

Menoufia University
 Faculty of Engineering, Shebin El-Kom
 Electrical Engineering Department
 Postgraduate-Master of science
 Final Term Exam



Subject/Code: Electrical Materials/ELE 608
 Year : 2013-2014
 Time Allowed : 3 hours
 Exam Date : 14 / 1 / 2014
 Total Marks : 100 marks

Allowed Tables and Charts: (None)

Answer the following questions

Question (1)

(25 Marks)

- (1.a) Define: Conductivity - Resistivity - Semiconductor materials
 (1.b) Discuss the factors that must be considered for selecting electrical material.
 (1.c) A coil is made of copper wire, at a temperature of 20 °C the resistance of the coil is 400 Ω. Calculate the resistance of the coil at a temperature of 80 °C. Take the temperature coefficient of copper as 0.0033 Ω per °C at 0 °C.

Question (2)

(25 Marks)

- (2.a) Explain the classification of conducting materials.
 (2.b) Discuss the factors that effect on the resistance of semiconductor materials.
 (2.c) What is the applications of semiconducting materials and discuss one of them?
 (2.d) Compare between the Dia, Para and Ferro magnetic materials.

Question (3)

(25 Marks)

- (3-a) What are the insulation resistance, dielectric strength, and dielectric loss and discuss the factors that effect on them?
 (3-b) Write short notes on:
 Solubility - chemical resistance - mechanical strength - porosity
 (3-d) Mention the general properties and the field of applications of the following insulating materials.
 Teflon – Polyethylene – Mica – Porcelain – Sulfur hexafluoride (SF6)

Question (4)

(25 Marks)

- (4-a) Explain briefly the thermal breakdown of solid dielectrics.
 (4-b) Discuss the short-term and long-term breakdown in composite dielectrics.
 (4-c) What is polymer nanocomposite and give its constituents? Describe the importance of nanocomposites in electrical insulator.

Good LuckDr. Hala S. Elsayed

Dr. Amr M. Abdul-Hady

| This exam measures the following ILOs | | | | | | | | | | | | | | |
|---------------------------------------|----------------------------------|------|------|------|---------------------|------|--|--|---------------------|--|-------|------|--|--|
| Skills | Knowledge & Understanding Skills | | | | Intellectual Skills | | | | Professional Skills | | | | | |
| | a1.1 | a1.3 | a1.2 | a3.1 | b5.1 | b6.1 | | | | | c.1.1 | e4.3 | | |
| Question Number | Q1 | Q3 | Q3 | Q2 | Q4 | Q3 | | | | | Q2 | Q4 | | |