

Menoufiya University  
 Faculty of Engineering  
 Shebin El-Kom  
 Postgraduate-PhD  
 Final Exam



Subject/code: High Voltage  
 Engineering/ELE702  
 Time Allowed: 3 hours  
 Year: 2014-2015  
 Date: 14-1-2015

Allowed Tables and Charts: (None), Total marks: 100

Answer ALL Questions:

**Question (1)**

**(35 Marks)**

(1-a) What is polymer nanocomposite and give its constituents?

(1-b) Describe the importance of nanocomposites for enhancement dielectric strength and tracking resistance in electrical insulator.

(1-c) Explain the effect of TiO<sub>2</sub> nanoparticles on the creeping flashover behavior of oil/pressboard interface under AC and impulse electric stress.

**Question (2)**

**(35 Marks)**

(2-a) Explain the effect of semiconductive nanoparticles on relative permittivity, resistivity, breakdown voltage, and partial discharge inception voltage of transformer oil.

(2-b) Describe the effect of repeated impulses on transformer insulation considering its V-N characteristics.

(2-c) Discuss the effect of TiO<sub>2</sub> nanoparticles on relative permittivity, tanδ, breakdown voltage, and partial discharge inception of oil-paper composite considering different temperature and moisture contents.

**Question (3)**

**(30 Marks)**

(3-a) Compare between natural ester/pressboard and mineral oil/pressboard insulation system considering their moisture content, acidity content, ac breakdown strength, and relative permittivity.

(3-b) Explain the impact of lightning impulse and AC superimposed voltage on the insulation characteristics of oil-immersed power transformer.

Good Luck ..... Prof. Mohamed A. Izzularab  
 Dr. Amr M. Abdelhady

This exam measures the following ILOs												
Skills	Knowledge & Understanding Skills				Intellectual Skills					Professional Skills		
	a1-1	a2-1	a4-1		b1-1	b9-1				c2-1	c3-1	
Question Number	Q1-a, b	Q1-c Q2-b	Q3-a,b		Q1-a,b	Q3-a				Q3-b	Q2-a,c	