Menoufia University
Faculty of Engineering, Shebin El-Kom
Electrical Engineering Department
Postgraduate-Master of science
Second Semester

Subject/Code: High and Extra-High Voltage Engineering/ ELE 607
Year : 2017-2018
Time Allowed : 3 hours
Exam Date : 25/5 / 2018
Total Marks : 100 marks

Answer the following questions

Question 1 *(25 marks)*

(1-a) Discuss the pre-breakdown discharges phenomena

(1-b) Compare between breakdown gradient characteristics of impulse, alternating and D.C voltages considering rod-plane gaps.

(1-c) Discuss briefly the effect of atmospheric conditions, density of air, and humidity on flashover voltage of high voltage insulators.

Question 2 *(25 marks)*

(2-a) Explain the Obenaus flashover model of high voltage insulators considering physical, and electrical m els.

(2-b) Discuss the methods that used to avoid flashover in high voltage insulators.

Question 3 *(25 marks)*

(3-a) Discuss the lightning mechanism including upward and downward initiated discharge.

(3-b) Write short notes on: Shielding failures - Backflashover

(3-c) Compare the performance characteristics of silicon carbide arrester with a zinc oxide arrester. What are the advantages and disadvantages of each?

(3-d) Explain how to select surge arrester rating in extra high voltage system. Give an example.

Question 4 *(25 marks)*

(4-a) Compare between the different extra high voltage cable types considering their constructions and in lation properties.

(4-b) Classify the cooling types of extra high voltage cables with declaring the laying methods in the soil.

(4-c) A 3-phase 275 kV cable system consisting of 3 single-core cables is designed to operate at a maximum voltage of 287 kV, line-to-line. Its life is expected to be 30 years. In the factory, a 15 minute test is intended to be given. Taking n = 12, calculate the magnitude of test voltage to be applied between conductor and sheath that will simulate service conditions using maximum continuous voltage as the basis for design.

With our best wishes

Prof. Dr. Mohamed Izzularab and Dr. Amr Abdelhady

This exam measures the following ILOs								
Skills	Knowledge&Understanding Skills				Intellectual Skills			Professional Skills
	a1.1	a1.2	a1.5	a1.3	b1.2	b5.1	b5.3	c4.3
Question Number	1b	1a	2a,b,c	4a,c	3c	1c	4b	3a,b,d