Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: EE369

Course Name: HIGH VOLTAGE ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks

			Marks
1		Define ripple and ripple factor with its mathematical expressions.	(5)
2		Develop and draw the equivalent circuit of an insulating material during partial discharge.	(5)
3		What are the different tests carried out on the testing of bushings.	(5)
4		With the help of neat diagram explain the principle of operation of series resonant circuit for generating high ac voltages.	(5)
5		Define an impulse voltage wave with its time intervals. Also give the standard specification of the impulse voltage wave.	(5)
6	a)	Explain the principle of measurement using sphere gap.	(5)
	b)	What are the factors influencing the spark over voltage of the sphere gap?	
7		What are partial discharges? Differentiate between internal and external discharges.	(5)
8		Why is grounding very important in a high voltage laboratory? Describe a typical grounding system used.	(5)

PART B

Answer any two full questions, each carries 10 marks

9	a)	With the help of a neat sketch, explain the operation of Cockroft-Walton multiplier circuit under loaded and unloaded conditions.	(7)
	b)	What is a cascaded transformer and why cascading is done?	(3)
10	a)	Describe a three stage cascaded transformer with a neat diagram. Label the power ratings of various stages of the transformer.	(7)
	b)	Derive the expression for peak to peak ripple of Cockroft-Walton multiplier circuit.	(3)
11	a)	With the help of neat figure explain the principle of operation of Van de-Graaff generator and its applications.	(5)
	b)	Explain the working principle of resonant transformer with the help of a circuit.	(5)

PART C

Answer any twofull questions, each carries10 marks

12	a)	Describe the construction and operation of Marx circuit for multistage impulse generation.	(7)
	b)	Mention the advantages and disadvantages of generating voltmeter.	(3)
13	a)	With the help of a neat circuit explain the generation of rectangular current pulses for testing purposes.	(5)
	b)	What is Rogowski coil? With a neat diagram explain its operation for	(5)

measurement of high impulse currents.

14 a) What is a trigatron gap? Explain its functions. (3)

b) Explain the working and construction of an electrostatic voltmeter for very high voltages. (7)

PART D

Answer any two full questions, each carries 10 marks

15 a) With the help of a diagram explain the method of measuring Radio interference voltage of transmission line hardware. (6)

b) Explain the following terms: (4)

i) Withstand voltage ii) Flashover voltage

iii) 50% flashover voltage iv) Disruptive discharge voltage

16 a) Define self restoration and non self restoration systems. (2)

b) What are the objectives of high voltage testing? (2)

c) List the common test facilities available in high voltage laboratories. (3)

d) What is the significance of impulse tests? Briefly explain the impulse testing of insulators. (3)

17 a) Explain the different electrical tests done on isolators and circuit breakers. (5)

b) Explain any one of the non-destructive testing method for the early detection of insulation fault. (5)

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