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Reg. No. : | | | | | | | | | | |

Question Paper Code: 59303

B.E./B.Tech. DEGREE EXAMINATION, NOV 2018

Elective

Electrical and Electronics Engineering

15UEE903- HIGH VOLTAGE ENGINEERING

(Regulation 2015)

Duration: Three hours | Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 3 = 15 Marks)

1.	List out the sources causing switching surges.	CO1- U
2.	Recall Townsends condition for breakdown.	CO2- R
3.	Draw simple voltage multiplier circuit for high DC voltage generation.	CO3- U
4.	What is the need for impulse current measurement?	CO4- U
5.	Define Insulation coordination.	CO5- U

PART – B (5 x 14= 70 Marks)

6.	(a)	Explain in brief about the various causes and effects of switching surges and power frequency overvoltage's in power system.	CO1-U	(14)
		Or		
	(b)	Mention the properties and procedure to construct the Bewley's Lattice diagram with suitable illustration.	CO1-Ana	(14)
7.	(a)	(i) Derive the criterion for breakdown in electronegative gases.	CO2-Ana	(7)
		(ii) Analyze the various factors that influence breakdown in a gas.	CO2-Ana	(7)
		Or		
	(b)	(i) Derive an expression for Paschen's law.	CO2-Ana	(7)
		(ii) Analyze the streamer theory of breakdown in liquids.	CO2-Ana	(7)
8.	(a)	Describe with neat diagram the principle of operation, advantages, limitations and applications of Vande graff generator.	CO3-U	(14)
		Or		

	(b)	(i) List the merits and demerits of Marx circuit.	CO3-U	(4)
		(ii) Explain the operation of generating impulse voltage.	CO3-U	(10)
9.	(a)	Describe the Electrostatic voltmeter method of measuring high voltage.	CO4-U	(14)
		Or		
	(b)	(i) Construct with neat circuit diagram of capacitance potential transformer and explain its operation.	CO4-U	(10)
		(ii) Discuss the merits and demerits of generating voltmeter method.	CO4-U	(4)
10.	(a)	(i) Explain the different types and nature of test conducted for insulator.	CO5-U	(7)
		(ii) Analyze in detail about the insulation coordination system.	CO5-U	(7)
		Or		
	(b)	(i) Explain the following terms used in HV testing as per the standards. (a) Disruptive discharge voltage (b) Greepage Distance (c) Impulse Voltage (d) 100 % and 50 % flash over Voltage	CO5-U	(8)
		(ii) Explain the modern trends in the insulation design of EHV and UHV substations.	CO5-U	(6)

PART – C (1 x 15= 15Marks)

11.	(a)	Explain the mechanism of lightning strokes.	CO1-U	(15)
		Or		
	(b)	Explain the working of Cockcroft-Walton voltage multiplier circuit with a neat sketch.	CO3-U	(15)