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Code No: 117DQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, November/December - 2017
HIGH VOLTAGE ENGINEERING
(Electrical and Electronics Engineering)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	Why the temperature classification is not done for liquids and gases?	[2]
b)	Discuss the different dielectric materials according to their physical nature.	[3]
c)	What is paschen's law?	[2]
d)	Explain how the temperature affects the breakdown strength of solid dielectrics?	[3]
e)	Define wave front time and wave tail time.	[2]
f)	Discuss the functions of trigatron gap.	[3]
g)	What is the function of surge arrestor?	[2]
h)	List the characteristics of switching surges.	[3]
i)	Define the terms creepage distance an impulse voltage?	[2]
j)	State different tests to be conducted on H.V Insulators.	[3]

PART - B

(50 Marks)

2. Briefly explain various numerical methods for estimation of electric field in dielectric materials. Discuss their relative advantages and disadvantages. [10]

OR

3.a) Explain different insulating materials used in rotating machines.
b) Define surge voltages. Explain how they are distributed in the windings of power apparatus. [5+5]

4. Define Townsend's first and second Ionization coefficients. Explain the procedure of Townsend's criterion for breakdown in detail. [10]

OR

5.a) What is meant by Intrinsic strength? Explain intrinsic breakdown mechanism in solid dielectrics.
b) What are commercial liquid dielectrics? How they differ from pure liquid dielectrics? [5+5]

6.a) Derive the expressions for voltage ripple and regulation in a voltage multiplier circuit.
b) Explain about tripping and control of impulse generators. [5+5]

OR

7. Explain how a sphere gap can be used to measure the peak value of voltages, and illustrate it with a neat sketch. What are the parameters and factors that influence such voltage measurement? [10]

8. Explain the different aspects of insulation design and insulation coordination adopted for EHV systems. [10]

OR

9. What are the mechanisms by which lightning strokes develop an induce over voltages on overhead power lines? Explain. [10]

10. Explain the different electrical tests done on isolators and circuit breakers. [10]

OR

11.a) Briefly explain how partial discharges in an insulation system can be detected and displayed.

b) Define the terms:
i) Loss factor ii) 50% Flashover voltage [5+5]

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