Code No: 117DQ

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, November/December - 2018
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) How is transformer Insulation divided?   [2]
  b) Discuss about Uniform and Non uniform fields.   [3]
  c) Define Composite Dielectric.   [2]
  d) What are the differences between pure and commercial liquids?   [3]
  e) What is a Tesla Coil?   [2]
  f) Explain the conditions to be satisfied by a potential divider to be used for impulse voltage
       measurements.   [3]
  g) What are the origins of switching surges?   [2]
  h) What are the methods employed for lightning protection of OH lines?   [3]
  i) How is lossy dielectric represented?   [2]
  j) Explain the terms Withstand voltage and Flash over voltage.   [3]

PART - B
                                                                        (50 Marks)

2.a) Explain how the electric stress can be estimated and controlled
  b) Indicate the solid insulation applications in high voltage bushings.   [5+5]
                                   OR
3.a) Mention the temperature classification for solid insulating materials.
  b) What is Boundary Element Method? How does it differ from Charge Simulation Method?
                                                                              [5+5]

4.   Explain the process of ionization by collision in gaseous discharge.   [10]
                                   OR
5.a) Explain the various mechanisms of breakdown pheonomenon in commercial liquids
  b) Explain how treeing and tracking leads to breakdown in solid insulating materials.
                                                                              [5+5]
6.a) Explain different methods for generation of high frequency AC voltages.
  b) What is meant by potential divider? How it is used for impulse voltage measurements.
                                                                              [5+5]
                                   OR
7.   Draw the Marx circuit arrangement for multistage impulse generators. How is the basic
       arrangement modified to accommodate the wave time control resistances?   [10]

8.	Give the mathematical models for lightning discharges and explain them.	[10]

OR

9.	Explain the importance of switching overvoltages in EHV power systems. How is the protection against over voltages achieved?	[10]

10.a)	Explain the impulse testing of high voltage transformers.

b)	Explain the importance of Radio interference voltage measurements for EHV power apparatus.	[5+5]

OR

11.	Explain with a neat sketch, the high voltage Schering bridge for the tan δ and capacitance measurement of insulators or bushings.	[10]

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