Total No. of Questions : 12]

SEAT No. :

P3349

[Total No. of Pages : 3

[4959]-81

B.E. (Electrical Engineering)

b:HIGH VOLTAGE ENGINEERING

(2008 Course) (Semester - II) (Elective - III)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answer 3 questions from Section I and 3 questions from Section II.***
2) ***Answer to the two sections should be written in separate book.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Use of logarithmic table slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.***
6) ***Assume Suitable data, if necessary.***

SECTION - I

Q1) a) Explain the Townsend's Theory of breakdown of gaseous dielectrics. Explain Townsend's breakdown criterion. **[8]**

b) Explain and also compare the corona discharges for point plane electrode combination with positive and negative pulse application. **[8]**

OR

Q2) a) What is Paschen's Law? Explain the meaning of minimum breakdown voltage. **[8]**

b) Explain electron attachment process. Explain the properties of electronegative gas. Give examples of electronegative gas. **[8]**

Q3) a) Explain any two breakdown phenomenon in case of liquid dielectric material. **[8]**

b) What type of impurities are found in liquid dielectric material? Explain the purification cycle of liquid dielectric material to remove impurities. **[8]**

OR

P.T.O.

Q4) a) Write short note on electromechanical breakdown and thermal breakdown. **[8]**

b) Explain the breakdown in composite dielectrics. **[8]**

Q5) a) What are the causes of occurrence of switching surge. **[8]**

b) Compare horn gap type lightning arrestor and ZnO gapless lightning arrestors. **[10]**

OR

Q6) a) What is statistical approach of insulation co-ordination on high voltage power system and substation? **[10]**

b) Compare between Simpson and Wilson theory of charge formation in clouds. **[8]**

SECTION - II

Q7) a) Define impulse waveform. What do you mean by a standard impulse waveform? Explain wave front and wave tail time. **[8]**

b) With a neat sketch explain Tesla coil. How high ac voltage of high frequency is generated with it? **[8]**

OR

Q8) a) What is the principle of operation of resonant transformer? How it is advantageous over cascade connected transformer? **[8]**

b) A 12 stage impulse generator has 0.2 μF capacitors. The wave front and the wave tail resistance connected are 600 ohms and 4000 ohms respectively. If load capacitor is 1000PF, find the front and tail times of the impulse wave produced. **[8]**

Q9) a) With neat diagram explain CVT. Explain its advantages also. **[8]**

b) Discuss the use of sphere gap unit for measurement of high magnitude DC, AC and impulse voltage. Explain the effect of various factors influencing the spark-over voltage of sphere gap. **[10]**

OR

Q10)a) Explain resistance, capacitance and mixed potential dividers with their advantages and disadvantages. **[12]**

b) A generating voltmeter has to be designed so that it can have a range from 30 to 200kV DC if the indicating meter reads a minimum current of 2 micro Ampere, what will be maximum current of meter? What should be the capacitances of generating voltmeter be? **[6]**

Q11)a) What is partial discharge? With neat diagram explain the method of measurement of partial discharge. **[8]**

b) Explain high voltage testing of power transformer. **[8]**

OR

Q12)Write any two tests on following: **[16]**

a) Insulators

b) Bushings

c) Isolators

d) Circuit Breakers