D 27194

Name.....

Reg. No.....

FIFTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION DECEMBER 2006

EE 2K 506 C/PTEE 2 K 504 C—HIGH VOLTAGE ENGINEERING

Time : Three Hours Maximum : 100 Marks

I. (a) What is Paschen's law ?

(b) Define Townsend's first and second ionisation coefficients.

(c) What is meant by a Tesla coil ?

(d) Define the front and tail times of an impulse wave.

(e) How can a sphere gap be used to measure the peak value of a voltage ?

(f) Explain how high impulse currents are measured using Rogowski coil.

(g) What are the different methods employed for lightning protection of overhead lines ?

(h) What is the importance of RIV measurement for EHV power apparatus ?

(8 × 5 = 40 marks)

II. (a) Explain streamer Theory of breakdown in gases. (7 marks)

(b) Explain the terms "treeing" and "tracking". (7 marks)

Or

(c) What are the factors affecting breakdown strength of solid dielectries ? (8 marks)

(d) Describe the mechanism of short term breakdown of composite insulation. (7 marks)

III. (a) Explain the working of a three stage cascade transformer set. (8 marks)

(b) Explain the basic principle of an electrostatic generator. (7 marks)

Or

(c) Explain the function and operation of a trigatron gap. (8 marks)

(d) Discuss the Marx circuit arrangement for multistage impulse generators. (7 marks)

IV. (a) Discuss the different methods of measuring high D.C. voltage. (8 marks)

(b) Why are capacitor voltage dividers preferred for high A.C. voltage. (7 marks)

Or

(c) Explain how a mixed potential divider is used for impulse voltage measurement. (8 marks)

(d) What are the requirements of an oscillograph for impulse and high frequency measurements in high voltage test circuits ? (7 marks)

V. (a) How can partial discharges in an insulation system be detected ? (15 marks)

Or

(b) Derive the expression for voltage and current waves on long transmission lines and obtain the surge impedance of the line. (15 marks)

[4 × 15 = 60 marks]