

[06 - 4211]

IV/IV B.E. DEGREE EXAMINATION.

Second Semester

Electrical and Electronics Engineering

Elective II — HIGH VOLTAGE ENGINEERING

(Effective from the admitted batch of 2006-2007)

Time : Three hours

Maximum : 70 marks

Question No. 1 is compulsory.

Answer any FOUR questions from the remaining.

All questions carry equal marks.

1. (a) What are different forms of high voltages?
- (b) Define impulse current waveform.
- (c) Give the basic circuit for measuring the peak voltage of A.C voltage and impulse voltage?
- (d) What is a capacitive voltage transformer?
- (e) How a fault in a long cable is detected and located using partial discharge technique.
- (f) Explain the terms :
  - (i) withstand voltage
  - (ii) flashover voltage.
- (g) List out the common facilities for testing available in H.V laboratories.

2. Describe, with a neat sketch, the working of an Van de Graaff generator. What are the factors that limit the maximum voltage obtained?
3. (a) Why is it preferable to use isolating transformer for excitation with cascade transformer units, if the power requirement is large?  
(b) Explain the working of Van de Graaff generator.
4. (a) Describe the generating voltmeter used for measuring high DC voltages.  
(b) A generating voltmeter has to be designed so that it can have a range from 20 to 200 KV d.c. If the indicating meter reads a minimum current of  $2\ \mu\text{A}$  and maximum current of  $25\ \mu\text{A}$ , what should the capacitance of the generating voltmeter be?
5. (a) What are the requirements of an oscillograph for impulse and high frequency measurements in high voltage test circuits?  
(b) What is a mixed potential divider? How it is used for impulse voltage measurement?
6. (a) What are partial discharges? Differentiate between internal and external discharges?  
(b) Develop and draw equivalent circuit of insulating material during partial discharge.

7. What is the significance of impulse tests? Explain briefly the impulse testing of insulators.
8. What are the criteria used in selecting the ratings of the testing equipment for H.V. laboratories?