

Roll No

EX-7201

B.E. VII Semester

Examination, December 2016

High Voltage Engineering

Time : Three Hours

Maximum Marks : 70

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each question are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.

1. a) What are the principle factors that influence the development of power transmission networks?
b) Define high voltage for AC/DC circuits and electrical power transmission engineering.
c) Discuss the basic classification of testing voltages in high voltage engineering.
d) Explain the need for generating high voltages in the laboratory.

OR

What are the advantages of transmitting electrical power at high voltage? Mention the industrial applications of high voltages.

2. a) Explain the term 'Electron attachment'.
b) What is Paschen's law?
c) Describe the various factors that influence breakdown in a gas.
d) Explain in detail electro convection breakdown in transformer.

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Explain the different mechanisms by which breakdown occurs in solid dielectrics in practice.

3. a) What is the principle of operation of a resonant transformer?
b) Draw the circuit for producing impulse voltage.
c) What is trigatron gap? Explain its functions.
d) Explain the different methods of producing switching impulses in test laboratories.

OR

A voltage doubler circuit has $C_1 = C_2 = 0.01 \mu\text{f}$ and is supplied from a voltage source of $V = 100 \sin 314t$ kV. If the dc output current is to be 4mA, calculate the output voltage and the ripple.

4. a) What is the principle of operation of an electrostatic voltmeter for very high voltages?
b) What is a mixed potential divider?
c) Compare the relative advantages and disadvantages of using a series resistance microammeter and a potential divider with an electrostatic voltmeter for measuring high dc voltages.
d) Explain how and why a sphere gap is used for measurement of high voltage. Discuss the factors that influence the measurement using sphere gap.

OR

Explain the working principle of generating voltmeter with a neat sketch.

5. a) Explain the terms:
i) Withstand voltage ii) Flashover voltage
b) What is the significance of power factor test on bushings?
c) What are partial discharges?
d) What are the tests on transformer and explain the impulse testing of transformer?

OR

Explain with a neat schematic diagram, the synthetic testing of circuit breakers.

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