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Roll No

EE-702(A)-CBGS

B.Tech., VII Semester

Examination, December 2020

Choice Based Grading System (CBGS)

High Voltage Engineering

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) What are the different types of insulation? Briefly explain them with the help of examples and their applications.
b) What are electronegative gases? Why is the breakdown strength higher in these gases compared to that in other gases?
2. a) Explain the phenomenon 'treeing and tracking' in solid insulating materials under electrical stress. How does it lead to breakdown?
b) Explain the phenomena of electrical conduction in liquid dielectrics. How does it differ from that in gases?
3. a) Explain why impulse testing is important for power transformer insulation and how it is performed?
b) According to IEC, define Insulation Co-ordination. How are the protective devices chosen for optimal insulation level in a power system?
4. a) What are the mechanisms by which lightning strokes develop and induce overvoltages on overhead power lines?

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- b) Discuss the broad categories in which overvoltage is categorized with the help of examples.
- 5.
- a) Explain the Streamer theory of breakdown in air at atmospheric pressure.
 - b) What is “thermal breakdown” in solid dielectrics, and how is it practically more significant than other mechanisms?
- 6.
- a) Define the front and tail times of an impulse wave. What are the tolerances allowed as per the specifications? Give different circuits that produce impulse waves explaining clearly their relative merits and demerits.
 - b) What is a Tesla coil? How are damped high frequency oscillations obtained from a Teslacoil?
- 7.
- a) Explain the working of Potential Dividers Used for High Voltage Impulse Measurements in detail.
 - b) Discuss in detail the factors Influencing the Sparkover Voltage of Sphere Gaps.
- 8.
- a) Write a short note on following terms-
 - i) Partial Discharge and Dielectric power Factor
 - ii) Relative, absolute permittivity and DC resistivity
 - b) Explain the terms
 - i) withstand voltage,
 - ii) flashover voltage,
 - iii) 50% flashover voltage,
 - iv) wet and dry power frequency tests as referred to high voltage testing.

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