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CC-45

M. Tech. EXAMINATION, Dec. 2018

(Third Semester)

(B. Scheme) (Main & Re-appear)

EE(PS)

MPS631B

HIGH VOLTAGE ENGG.

Time : 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit.

Unit I

1. State Paschen's law. Derive an expression for the Paschen's minimum breakdown voltage. Explain the practical applications of Paschen's law in design of high voltage apparatus. **15**

2. Explain the following :

(i) Stressed oil volume theory

(ii) Cavitation and bubble theory suspended particle mechanism. **15**

Unit II

3. Describe, with a neat sketch, the working of a van de Graaff generator. What are the factors that limit the maximum voltage obtained ? **15**

4. (a) What is the principle of Operation of a resonant transformer ? How is it advangeous over the cascade connected transformers ? **7.5**

(b) Explain the principle and construction of an electrostatic voltmeter for very high voltages. What are its merits and demerits for high voltage a.c. measurements ? **7.5**

Unit III

5. What are the different power frequency tests done on insulators ? Mention the procedure for testing. **15**

6. (a) List out the various characteristics of the electric field due to point-charge. **5**

(b) The field strength on the surface of sphere of 1 cm radius is equal to the corona-inception gradient in air of 30 kV/cm. Find the charge on sphere which is supposed to be at its centre. **10**

Unit IV

7. Discuss how disruptive voltage, visual voltage and corona power-loss are related to corona ? Also give their expressions. **15**

8. (a) Define the term 'lighting'. **5**

(b) Explain the two theories of charge-separation process during lightning in the sky. **10**