



## GOVERNMENT COLLEGE OF ENGINEERING, JALGAON

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Name of Examination : **Summer 2021** - (Preview)

Course Code & Course Name : **EE454C - Elective IV-High Voltage Engineering**

Generated At : **19-04-2022 15:02:12**

Maximum Marks : **60**

Duration : **3 Hrs**

[Edit](#) [Print](#) [View Answer Key](#) [Close](#) **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.

**1) Solve any three sub-questions.**

- a) What are the causes for switching and power frequency over voltages? How are they controlled in power system? [6]
- b) What are the Electro negative gases? Why is the break down strength higher in these gases compared to that in other gases? Explain the streamer theory of break down in air at atmospheric pressure. [6]
- c) State the criteria for sparking potential and hence obtain the relation between sparking potential and (pd) values (Paschen's Law). Discuss on the nature of variations of sparking potential with (pd) values. [6]
- d) What do you understand by intrinsic strength of solid dielectrics? Explain different mechanisms by which breakdown occurs in solid dielectrics in practice. [6]

**2) Solve any three sub-questions.**

- a) Describe with a neat sketch the working of a Van De Graff generator. What are the factors that limit the maximum voltage obtained? [6]
- b) Give the Marx circuit arrangement for multistage impulse generators. How is the basic arrangement modified to accommodate the wave time control resistances? [6]
- c) What is a cascaded transformer? Explain why cascading is done? Describe with neat diagram, a 3-stage cascaded transformer. [6]
- d) A six stage impulse generator designed to generate the standard waveform (1.2/50 s) has a per stage capacitance of 0.06 [6]

**3) Solve any three sub-questions.**

- a) Explain with neat diagram the principle of operation of an electrostatic voltmeter. Discuss its advantages and limitations for high voltage measurements. [6]
- b) A Rogowski coil is to be designed to measure impulse currents of 10 kA having a rate of change of current of 1010A/s. The current is read by a VTVM as a potential drop across the integrating circuit connected to the secondary. Estimate the values of mutual inductance, resistance, and capacitance to be connected, if the meter reading is to be 10 V for full-scale deflection. [6]
- c) Describe the construction, principle of operation of a Generating voltmeter and give its applications and limitations. [6]
- d) With neat sketch, explain in detail any one method used to measure the RMS and peak values of high AC voltages. [6]

- 4) What are the different power frequency tests done on insulators? Mention the procedure for testing. [6]**

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