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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Seventh Semester, B.E. - Electrical and Electronics Engineering

Semester End Examination; Dec - 2016/Jan - 2017

High Voltage Engineering

Time: 3 hrs

Max. Marks: 100

Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.

UNIT - I

- 1 a. List out the applications of high voltage. 5
- b. Explain primary and secondary ionization processes in gaseous dielectrics. 10
- c. What is a non uniform field? Discuss breakdown in non uniform field. 5
- 2 a. Explain streamer theory of breakdown in gases. 10
- b. Explain the thermal breakdown in solid dielectric. 5
- c. Explain cavity breakdown in liquid dielectric field. 5

UNIT - II

- 3 a. What is the need for cascading of transformers? 5
- b. Explain the working of Tesla Coil. 7
- c. Explain the Cockcroft-Walton type high voltage DC set. 8
- 4 a. Explain a series resonant circuit. 7
- b. Explain voltage doubler circuit. 7
- c. Define ripple regulation and optimum number of stages. 6

UNIT - III

- 5 a. Define standard lighting and switching impulse voltage. Draw the waveforms. 6
- b. Explain multi stage Marx impulse generator. 8
- c. An impulse generator has 8 stages with each capacitor rated for 0.16 μ F, 125 kV. The load capacitor is 1000 pF. Find series resistance and damping resistance to produce 1.2/50 impulse wave. 6
- 6 a. How do you generate switching surges? Explain. 7
- b. Explain working of a trigatron gap. 7
- c. An impulse current generator has a total capacitance of 8 μ F. The charging voltage is 25 kV. If generator has to supply an output current of 10 kA with 8/20 μ s waveform, determine; 6
 - i) Circuit inductance
 - ii) Dynamic resistance of circuit.

UNIT - IV

- 7 a. Explain with a neat diagram the working of electrostatic voltmeter. Mention its limitations. 10
- b. Explain working of Resistance divider. What are its limitations? 6
- c. Write a note on Klydano graph. 4
- 8 a. Explain standard sphere gap measurements for impulse voltage. Discuss on limitations of such a method. 10
- b. Explain the working of capacitance divider. 6
- c. Write a note on generating voltmeter. 4

UNIT - V

- 9 a. What is dielectric loss? Explain. 4
- b. Explain high voltage schering bridge. 8
- c. Explain tests on circuit breaker. 8
- 10 a. What is the need for discharge detection? Explain. 4
- b. Explain straight detection method of discharge detection. 8
- c. Explain tests on Insulators. 8

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