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BIEE-018

B.Tech. – VIEP – ELECTRICAL ENGINEERING (BTELVI)

Term-End Examination

December, 2015

BIEE-018 : HIGH VOLTAGE ENGINEERING

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. All questions carry equal marks.*

1. (a) With the help of a suitable diagram, explain the working of a cascaded voltage multiplier circuit for high voltage generation. *7*

(b) Derive an expression for ripple in a cascaded voltage multiplier circuit. *3*

2. A Rogowski coil is to be designed to measure the impulse current 10 kA having a rate of change of current of 10 A/sec. The current is read by a VTVM as a potential drop across the integrating circuit connected to the secondary. Estimate the value of mutual inductance and capacitance to be connected, if the meter reading is to be 10 V for full scale deflection. Resistance has to be selected as 2×10^3 ohms. *10*

3. (a) Explain a typical series resonance circuit for the production of high voltage. 5

(b) Explain a typical wave shaping circuit with the help of a simple diagram. 5

4. Explain the principle and working of hall generator used for the measurement of high direct current with the help of a neat sketch. 10

5. With the help of a neat labelled diagram, explain the construction and working of an electrostatic voltmeter. 5+5

6. What is dielectric loss ? Explain in detail a method for measuring the dielectric loss of a solid dielectric. 2+8

7. Explain Townsend's theory of discharge in a gaseous dielectric. Define Townsend's first and second ionization constant. 6+2+2

8. (a) How does Streamer theory remove the limitations and drawbacks of Townsend's theory ? 5

(b) Define Paschen's law. Give the mathematical expression of Paschen's law. Where is this law used ? 2+2+1

9. (a) Explain how the radio interference can be measured with the help of a simple circuit diagram. *5*

(b) How are high voltage measurements done on circuit breakers and surge diverters ? *5*

10. Write short notes on any ***two*** of the following : *2×5=10*

(a) Thermal Breakdown

(b) Schering Bridge

(c) Voltage Doubler

(d) Van de Graaff Generator