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

Term-End Examination

June, 2016

00446

BIEE-018 : HIGH VOLTAGE ENGINEERING

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any* ***seven*** *questions. Each question carries equal marks. Use of scientific calculator is permitted.*

1. Explain different types of rectifier circuits for producing high DC voltage. Also draw the waveforms of output voltage. *10*

2. (a) Define the front and tail times of an impulse wave. *5*

   (b) How are the front time and tail time of a wave controlled in impulse generator circuits ? *5*

3. Explain how a sphere gap can be used to measure the peak value of voltages. What are the factors that influence such voltage measurements ? *10*

4. A resistance divider of 1400 kV (impulse) has a high voltage arm of 16 kΩ and a low voltage arm consisting 16 members of 250 Ω, 2 watt resistors in parallel. The divider is connected to a CRO through a cable of surge impedance 75 Ω and is terminated at the other end through a 75 Ω resistor. Calculate the exact divider ratio. *10*

5. Describe the different tests performed on surge diverters before using on high voltage applications. *10*

6. Explain the inductively coupled ratio arm bridge for audio frequency range measurements. Also discuss its merits and demerits. *10*

7. What are electronegative gases ? Derive the criterion for the breakdown in electronegative gases. *10*

8. Explain the suspended particle mechanism for the breakdown in liquid dielectrics. Also discuss the pure liquid dielectrics. *10*

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

(a) Hall effect generators for high voltage measurement

(b) Corona Discharge

(c) High voltage testing of circuit breaker