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

Term-End Examination

00376   June, 2015

BIEE-018 : HIGH VOLTAGE ENGINEERING

Time : 3 hours   *Maximum Marks : 70*

Note : *Attempt any **seven** questions. All questions carry*
equal marks. Use of scientific calculator is allowed.

1. Draw a typical impulse current generator and
    explain its operation and application.   *4+4+2*

2. A 12-stage impulse generator has 0·126 µF
    capacitor. The wave front and the wave tail
    resistance connected are 800 Ω and 5000 Ω
    respectively. If the load capacitor is 1000 µF, find
    the front and tail time of the impulse wave
    produced.   *10*

3. (a) With the help of a suitable diagram, explain the working of a Van de Graaff generator used for generation of impulse voltage. *6*

(b) What are the advantages and disadvantages of Van de Graaff generator ? *4*

4. Explain the construction and working principle of an electrostatic voltmeter with the help of a suitable diagram. *10*

5. Explain in detail the various factors influencing the spark voltage of sphere gap used in high voltage measurements. *10*

6. Draw a high voltage Schering bridge for measurement of dielectric loss of a specimen, which is not grounded and derive an expression for loss angle. *5+5=10*

7. What do you understand by intrinsic strength of a solid dielectric ? Explain the electric breakdown of a solid dielectric. *4+6=10*

8. Explain Streamer's theory (mechanism) of breakdown in detail, with the help of suitable diagrams. *10*

9. (a) What is "treeing" in case of breakdown of solid dielectric ? Draw a neat sketch of "treeing". *4+1*

(b) Define Townsend's first and second ionization content. $2 \times 2\frac{1}{2} = 5$

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

(a) Paschen's Law

(b) Hall Effect Generator

(c) Voltage Doubler

(d) Rogowski Coil