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

Term-End Examination

00542   December, 2017

BIEE-003 : POWER SYSTEM – I

Time : 3 hours   *Maximum Marks : 70*

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

1. Two conductors in a single-phase transmission line are 6 m above the ground. Taking the effect of Earth into account, calculate the capacitance/km. Each conductor is of 1·5 cm diameter and conductors are spaced 3 m apart. Take the value of K_0 as $\dfrac{1}{36\pi} \times 10^{-9}$.   *10*

2. (a) What are Bundled Conductors ? What are their advantages over single conductors ?   *5*

   (b) Define Corona. How can corona be reduced ?   *5*

3. Explain how transmission lines are classified into short, medium and long lines and explain their characteristics.   *10*

4. (a) What is Sag ? Explain the variation of sag with load and temperature. 5

(b) What is Sag Template ? Draw a typical sag template and write the use of sag templates. 5

5. (a) Derive the expression of sag for equal level supports. 5

(b) Why are earth wires and vibration dampers used in transmission lines ? 5

6. Define and explain Kelvin's and Modified Kelvin's law for conductor size. Also give the limitations of Kelvin's law. *4+4+2*

7. Define Efficiency and Voltage Regulation of short transmission line. Draw a phasor diagram for a short transmission line. *3+3+4*

8. Describe the general construction of an underground cable with a neat sketch and explain each component of a typical underground cable. *10*

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

(a) Ferranti Effect

(b) Grading of Cables

(c) String Efficiency

(d) Surge Impendance