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BIEE-003

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

Term-End Examination

00283 **December, 2016**

BIEE-003 : POWER SYSTEM – I

Time : 3 hours *Maximum Marks : 70*

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

1. (a) List the advantages and limitations of high transmission voltage. 7

(b) Compare the conductor material (volume) for a 3-phase, 4-wire distribution system with that of a 2-wire D.C. distribution system. State the assumptions made. 7

2. (a) Describe briefly the following types of insulators : 7

(i) Pin type insulator

(ii) Suspension type insulator

(b) Explain what is meant by the string efficiency of a suspension insulator consisting of a number of units. What causes the string efficiency to be less than 100 percent ? 7

3. (a) Explain the phenomenon of corona loss. How can the corona loss be minimised in transmission lines ? 7

(b) Explain the modified Kelvin's law with graphical representation and also describe the limitations. 7

4. (a) What is a sag template ? Explain how this is useful for location of towers and stringing of power conductors. 7

(b) Describe with a neat sketch, the construction of a 3-core belted type cable. Discuss the limitations of such a cable. 7

5. (a) Find the values of ABCD constants for a medium transmission line with the following configurations (in terms of Z and Y) : 7

(i) Nominal π configuration

(ii) Nominal T configuration

(b) A single-phase overhead transmission line is delivering 600 kVA load at 2 kV. Its resistance and reactance are $0{\cdot}18\ \Omega$ and $0{\cdot}36\ \Omega$ respectively. Determine the voltage regulation if the load power factor is (i) 0·8 lagging, and (ii) 0·8 leading. 7

6. (a) State various types of distribution systems and compare their applications. 7

(b) State the advantages and disadvantages of a 3-wire A.C. distribution system over a 2-wire D.C. distribution system. 7

7. Write short notes on any ***two*** of the following : *2×7=14*

(a) Comparison of Cables and Overhead Lines

(b) Capacitance of Single and Multicore Cables

(c) Static and Synchronous Phase Modifiers

(d) Surge Impedance Loading (SIL)