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BIEE-003

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B.Tech. - IN - ELECTRICAL ENGINEERING (BTELVI)

Term-End Examination

December, 2012

BIEE-003 : POWER SYSTEM - I

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **any seven** questions of the following and each question carry **equal** marks. Use of scientific calculor is **allowed**.*

1. What is the effect of power factor on the cost of generation? What is the importance of interest on capital investment in calculating the cost of Electrical Energy ? **4+6=10**

2. State and prove Kelvin's law and modified Kelvin's Law for size of conductor for transmission. Discuss its limitations. **8+2=10**

3. A 3-phase, 220 KV, 50Hz transmission line consists of 1.5cm radius conductor spaced 2 metres apart in equilateral triangular formation. If the temperature is 40°C and atmospheric pressure is 76cm, calculate the corona loss per km of the line. Take Mo=0.85 **10**

4. Show how regulation and transmission efficiency are determined for medium lines using : 10

(a) End condesnor method

(b) Nominal T method

(c) Nominal π method.

Illustrate your answer with suitable vector diagrams.

5. Starting from first principle reduce expressions for ABCD constant of a long line in terms of its parameters. Define propagation constant and characteristic impedance. 10

6. What are "Power Circle Diagram"? How are they useful? Show how a receiving - end power circle diagram may be drawn for a transmission line? 10

7. State the classification of cables and discuss their general constructions. 10

8. Describe briefly with neat structure two type of insulators that are commonly used in over head transmission line. Discuss their merits and limitations. 10

9. An overhead line has a span of 200 metres between level supports. The conductor diameter is 1 cm and weight 0.65 kg /metre length. The allowable tension is 550 kg. Calculate the maximum sag. **10**

10. Write short notes on **any two** of the following : **2x5=10**
    (a) Skin and proximity effect.
    (b) Potential gradient and break down voltage.
    (c) Stringing chart and vibration dampers.