III B.Tech. I Semester Supplementary Examinations June 2024

Electrical Power Transmission

(Electrical and Electronics Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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UNIT–I

1. Prove that Inductance/ph of 3-phase hexagonally spaced double circuit line is same with GMD-GMR method and Flux linkage method   14M

OR

2. Develop the expression for the Inductance per unit length of an overhead line from the basics of magnetic fields.   14M

UNIT–II

3. The generalized constants of a 3- , 220KV rated voltage medium length line are
   A=D=0.936+j0.016
   B=33.5+j138
   C=(-5.18+j914)X10^{-6}S

   If the load at the receiving end is 50MW at 220KV with a power factor of 0.9 lagging, then what is the magnitude of line to line sending end voltage and sending end power factor?   14M

OR

4. Discuss in detail the nominal- representation with neat circuit diagram and phasor diagram. Derive also its performance specifications.   14M

UNIT–III

5. Obtain the equivalent T and   representations of long transmission line using mathematical analysis.   14M

OR

6. Discuss in detail the different mathematical methods for obtaining ABCD constants of long line.   14M

UNIT–IV

7. A surge of 20KV magnitude travels along a loss less cable towards its junction with two identical lossless over head transmission lines. The inductance and capacitance of the cable are 0.4mH/km and 0.5uF/km. The Inductance and Capacitance of the over head transmission lines are 1.5mH/km and 0.015uF/km. What is the magnitude of voltage at the junction due to surge?   14M

OR

8. Prove that the sum of incident wave and reflected wave is equal to transmitted wave for voltages and currents.   14M

UNIT–V

9. What is the purpose of Grading in Underground Cables? What are the different Grading Techniques? Explain in detail?   14M

OR

10. Give an elaborate discussion on types of insulating materials used for UGC and different varieties of Underground Cables.   14M

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