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Question Paper Code : 60571

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2026.

Fourth Semester

Electrical and Electronics Engineering

EE8402 – TRANSMISSION AND DISTRIBUTION

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Why high voltages are preferred for power transmission?
2. List the advantages of transposition of conductors.
3. Mention the significance of SIL in transmission line.
4. What is the impact of skin effect on the resistance of line?
5. How the voltage sag is characterized and the effect is reduced?
6. Compare suspension and Pin type insulators.
7. State the effects of unequal distribution of stress in a cable.
8. Differentiate capacitance and intersheath grading.
9. Name any four earthing systems followed in India.
10. Why FACTS devices are essential in transmission of power?

PART B — ($5 \times 13 = 65$ marks)

11. (a) Draw and explain the structure of modern power system with typical voltage levels.

Or

- (b) Determine the expression for the capacitance per phase of a three phase overhead transmission system when the conductors are symmetrically and unsymmetrically spaced.

12. (a) Draw the phasor diagram of a short transmission line and derive an expression for voltage regulation and transmission efficiency.

Or

- (b) A 3-phase, 50-Hz, transmission line having resistance of 5Ω per phase and inductance of 30 mH per phase supplies a load of 1000 kW at 0.8 lagging and 11 kV at the receiving end. Find
- (i) sending end voltage and power factor (6)
 - (ii) transmission efficiency (4)
 - (iii) regulation. (3)
13. (a) Derive the expression for determining the voltage distribution in a string of suspension type insulator and also calculate the string efficiency. (13)

Or

- (b) Explain the mechanical considerations for transmission line design and also discuss the cause and effect of wind and ice loading on the transmission line.
14. (a) Explain the methods of grading of cables with neat diagrams and necessary equations.

Or

- (b) Explain the construction of 3-core belted cable. Also derive the expression for the capacitance of a single core cable.
15. (a) Explain the different types of substation layouts and also list the advantages of Gas Insulated Substation.

Or

- (b) Discuss any two methods of voltage control and briefly explain the methods of power factor improvement.

PART C — ($1 \times 15 = 15$ marks)

16. (a) The conductors in a single-phase transmission line are 6 m Above ground. Each Conductor has a diameter of 1.5 cm and the two conductors are spaced 3 m apart.

Estimate the capacitance per km of the line

- (i) excluding ground effect and
- (ii) including the ground effect (Assume necessary data).

Or

- (b) For a string insulator with four discs, the capacitance of the disc is ten times the capacitance between the pin and earth. Calculate the voltage across each disc when used on a 66-kV line. Also estimate the string efficiency and comment on the insulator performance. (Assume necessary data.)