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Question Paper Code : 20455

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Fourth Semester

Electrical and Electronics Engineering

EE 6402 — TRANSMISSION AND DISTRIBUTION

(Regulations 2013)

(Common to PTEE 6402 – Transmission and Distribution for B.E. (Part-Time) – Fourth Semester – Electrical and Electronics Engineering, Regulations 2014)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the advantages of adopting EHV/UHV for transmission of AC electric power?

2. Why galvanized steel wire is not suitable for EHT lines for the purpose of transmitting large amounts of power over long distance?

3. What is skin effect?

4. Define proximity effect.

5. What is corona?

6. Why should the reactive power transfer in lines be minimized?

7. List the advantages of polythene insulators?

8. Why are insulators used with overhead lines?

9. Explain the term 'sag of a line'.

10. What is power circle diagram?

PART B — (5 × 13 = 65 marks)

11. (a) Explain the following of DC distributor

(i) Distributor fed at one end (5)

(ii) Distributor fed at both ends (4)

(iii) Distributor fed at the centre. (4)

Or

(b) Find the voltage drop on a DC distributor having concentrated loads supplied to both ends with

(i) equal voltages (7)

(ii) unequal voltages. (6)

12. (a) Derive the inductance of single - phase two wire line and three phase overhead line.

Or

(b) Derive the capacitance of a three-phase overhead line for Symmetrical Spacing and Unsymmetrical spacing.

13. (a) Derive voltage regulation, power factor and transmission efficiency of short transmission line with diagrams.

Or

(b) Derive the sending end current and voltage for a long transmission line with necessary diagram.

14. (a) What is grading of cables? Explain the following methods of grading of cables:

(i) Capacitance grading (7)

(ii) Intersheath grading (6)

Or

(b) Explain with the help of phasor diagram, the voltage control by synchronous condenser.

15. (a) Calculate sag and tension of a conductor when

(i) supports are at equal levels (7)

(ii) supports are at unequal levels. (6)

Analyze with, without the effect of ice loading and wind.

Or

(b) Explain the different cables used for three-Phase system.

PART C — (1 × 15 = 15 marks)

16. (a) A 33 kV, 50 Hz , 3-phase underground cable, 4 km long uses three single core cables. Each of the conductor has a diameter of 2.5 cm and the radial thickness of insulation is 0.5 cm. Determine (i) Capacitance of the cable/phase (ii) charging current/phase (iii) total charging kVAR. The relative permittivity of insulation is 3.

Or

(b) The insulation resistance of a single-core cable is 495 MΩ per km. If the core diameter is 2.5 cm and resistivity of insulation is 4.5×10^{14} Ω - cm, find the insulation thickness.