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Question Paper Code : 21508

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Fifth Semester

Electrical and Electronics Engineering

EE 2303/EE 53/10133 EE 506 — TRANSMISSION AND DISTRIBUTION

(Regulations 2008/2010)

(Common to PTEE 2303/10133 EE 506 — Transmission and Distribution for
B.E. (Part-Time) Third Semester — Electrical and Electronics Engineering —
Regulations 2009/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List out the limitations of high transmission voltage.
2. Define sag in transmission line.
3. Define proximity effect.
4. How will you reduce the corona loss?
5. Define Ferranti effect.
6. Define Voltage stability.
7. How will you improve the string efficiency?
8. Define grading of cables.
9. Name the factors that should be taken care of while designing and erecting a substation.
10. What do you understand by distribution system?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Draw a single line diagram of a typical a.c. power supply scheme and explain. (10)
- (ii) Discuss the advantages of high transmission voltage. (6)
- Or
- (b) (i) Explain the advantages of D.C Transmission. (8)
- (ii) Derive an approximate expression for sag in overhead lines when supports are at equal levels. (8)

12. (a) Derive an expression for the inductance per phase for a 3-phase overhead transmission line when
- Conductors are symmetrically spaced
 - Conductors are unsymmetrically placed but the line is completely transposed. (16)

Or

- (b) (i) The three conductors A, B and C of a 3-phase line are arranged in a horizontal plane with $D_{AB}=2m$ and $D_{BC}=2.5m$. Find line to line neutral capacitance per km if diameter of each conductor is 1.24cm. The conductors are transposed at regular intervals. (8)
- (ii) Derive an expression for the capacitance of a single phase overhead transmission line. (8)
13. (a) Using rigorous method, derive expression for sending end voltage and current for a long transmission line. (16)

Or

- (b) Write a short note on the following :
- Concept and procedure to draw power circle diagram (10)
 - Power transfer capability of the transmission lines. (6)
14. (a) Explain about the various methods of cable grading. (16)

Or

- (b) The self capacitance of each unit in a string of three suspension insulators is C. The shunting capacitance of the connecting metal work of each insulator to earth is $0.15C$ while for line it is $0.1C$. Calculate the voltage across each insulator as a percentage of the line voltage to earth and String efficiency. (16)
15. (a) What are the different types of bus bar arrangement used in substations? Illustrate your answer with suitable diagrams. (16)

Or

- (b) (i) A 2-wire d.c distributor 200 meters long is uniformly loaded with 2A/meter. Resistance of single wire is 0.3ohm/km. If the distributor is fed at one end, calculate :
- The voltage drop up to a distance of 150m from the feeding point
 - The maximum voltage drop. (8)
- (ii) Write short notes on the following :
- Ring main distributor
 - Current distribution in a 3 wire d.c system. (8)