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**Question Paper Code : 60508**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

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. What is meant by transposition in overhead transmission line?
4. What is skin effect? On what factors does it depend?
5. Define voltage regulation in connection with transmission lines.
6. What is the range of surge impedance in case of underground cables?
7. Mention any four insulating materials for cables.
8. What are the methods of improving string efficiency?
9. What is the function of isolators?
10. What is the need of an earthing 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) (i) Starting from fundamental derivation of flux linkages with conductor per phase, derive an expression for the inductance per phase for a 3-phase overhead transmission system when conductors are symmetrically placed. (10)  
(ii) A 3-phase 80 km long transmission line has its conductors of 10 cm diameter spaced at the corners of the equilateral triangle of 100 cm side. Find the inductance per phase of the system. (6)

Or

- (b) (i) If the double circuit 3-phase line as show in Fig. Q. 14 (a) has conductors of diameter 2.5 cm and distance of separation ( $D$ ) is 2 m in the hexagonal spacing arrangement calculate the phase-to-neutral capacitance in  $\mu F$  per 100 km of the line. (10)

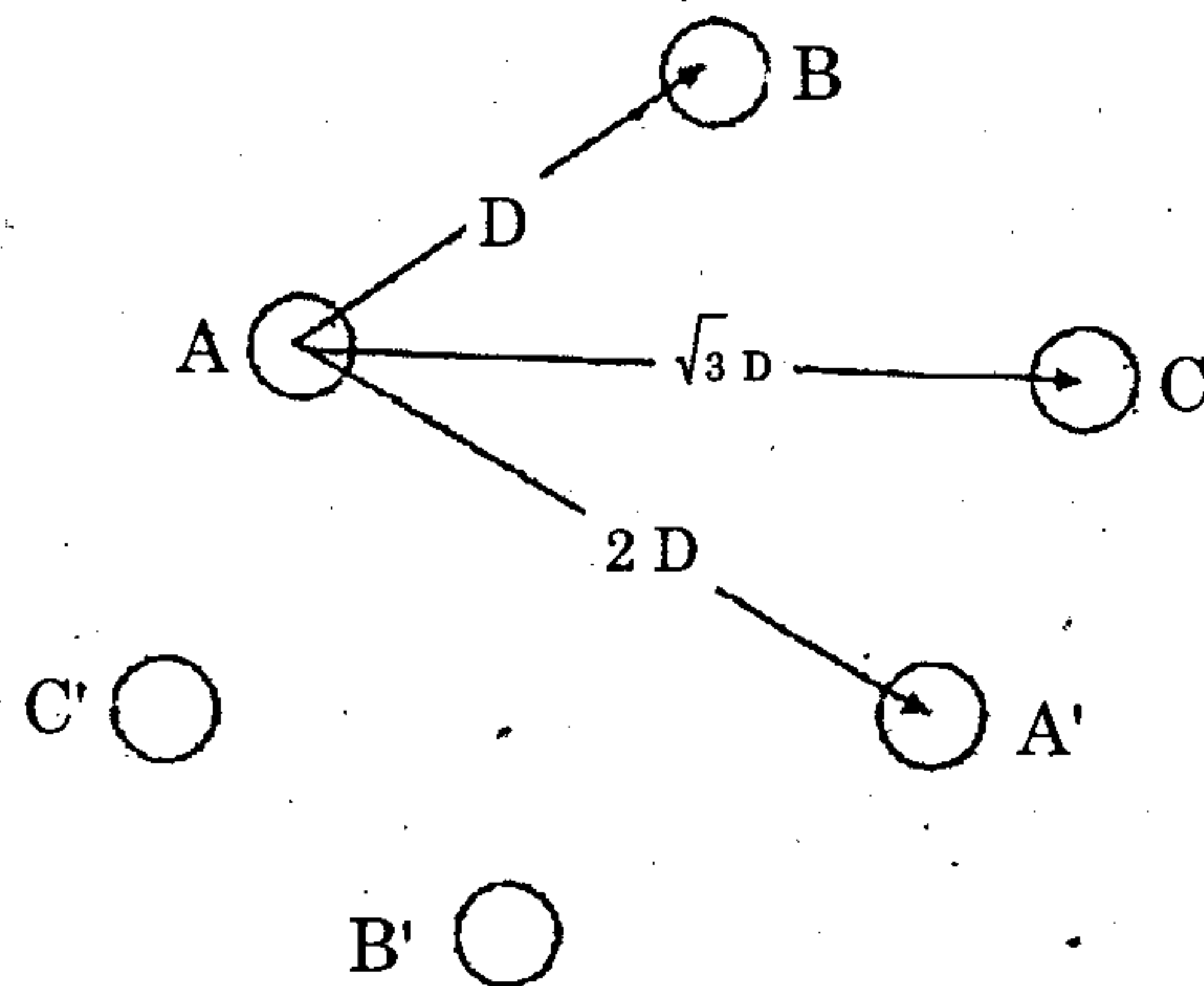


Fig. Q. 14(a)

- (ii) Explain the following terms with reference to corona : (6)
- (1) Critical disruptive voltage and
  - (2) Visual critical voltage.
13. (a) Explain the following methods for medium transmission lines. (8)
- (i) End condenser method (8)
  - (ii) Nominal T method (middle condenser method). (8)
- Or
- (b) (i) Explain the factors affecting corona loss. (10)
- (ii) Write short notes on corona power loss. (6)
14. (a) Explain in detail the different methods of improving the string efficiency. (16)
- Or
- (b) (i) Describe the general construction of an underground cable with a neat sketch. (8)
- (ii) State the classification of cables and discuss their general construction. (8)
15. (a) Explain the following system of distribution: (4)
- (i) Radial system (4)
  - (ii) Ring main system (4)
  - (iii) Interconnected system (4)
  - (iv) Design consideration in distribution system. (4)
- Or
- (b) (i) Write a short note on sub – station equipments. (10)
- (ii) Explain about double bus – bar with bypass isolators scheme. (6)