

**B.TECH. DEGREE EXAMINATION, MAY 2014**

**Seventh Semester**

Branch : Electrical and Electronics Engineering

EE 010 701—ELECTRICAL POWER TRANSMISSION (EE)

(Improvement/Supplementary)

[2010 Admissions]



Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer all questions.  
Each question carries 3 marks.*

1. What do you mean Electrostatic induction.
2. Derive the performance equation for short transmission line.
3. Explain one method to find fault in U.G. cables.
4. Write the advantages and disadvantages of corona.
5. Explain TCSR with neat ckt. diagram.

(5 × 3 = 15 marks)

**Part B**

*Answer all questions.  
Each question carries 5 marks.*

6. Derive the equation for capacitance of 3-phase line with equilateral spacing.
7. Derive the ABCD constants for medium lines using nominal 'Pi' method.
8. Derive equation for sag in long line transmission system.
9. Explain the radio interference of corona and interference between communication lines.
10. Explain statcom.

(5 × 5 = 25 marks)

Turn over



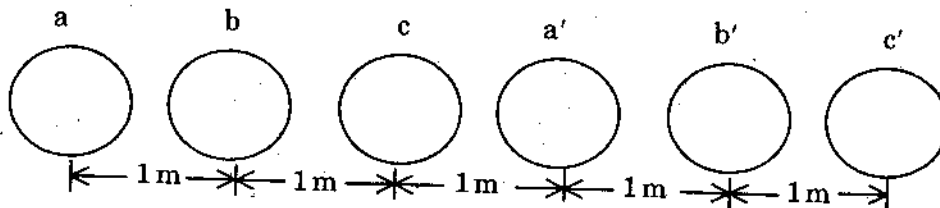
## Part C

Answer all questions.  
Each question carries 12 marks.

11. Derive the equation for capacitance of 3-phase line with unsymmetrical spacing but fully transposed.

Or

12. A double circuit 3-phase line shown below. The conductors aa', bb', cc' belong to the same phase respectively. The radius of each conductor is 1.5 cm. Find the inductance of the double circuit line in MH/KM/phase.



13. Derive the equation for powerflow through long transmission lines.

Or

14. A 3-phase OH line 200 m km long has resistance =  $0.16 \Omega/\text{km}$  and conductor dia a 2 cm with spacing 4 m, 5 m, 6 m transposed. Find (a) ABCD constants ; (b) the  $V_s$ ,  $I_s$ , Pfs,  $P_s$  when the line is delivering full-load of 50 MW at 132 kV and 0.8 pf lag ; (c) efficiency of transmission ; (d) the receiving end voltage regulation.
15. (i) What are the effects of ice and wind loading in long transmission lines ? (ii) What do you mean by testing of insulators ? Explain.

Or

16. A transmission line over a hillside where the gradient is 1 : 20 is supported by two 22 m. high towers with a distance of 300 m between them. The lowest conductor is fixed 2 m below the top of each tower. Find the clearance of the conductor from the ground. Given that conductor weighs 1 kg/m and the allowable tension is 1500 kg.
17. What is corona. Derive the equation for disruptive critical voltage and visual corona ?

Or

18. Explain different types of substations. But bar arrangement in substations and diff equipments in different substations.
19. Explain HVDC links with neat sketches.

Or

20. What are the major objectives of Flexible A.C. transmission system. Explain some important FACTS devices with neat sketch.

(5 × 12 = 60 marks)