

F 3321

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Reg. No.....

Name.....



B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Seventh Semester

Branch : Electrical and Electronics Engineering

EE 010 701—ELECTRICAL POWER TRANSMISSION (EE)

(New Scheme—Regular / Supplementary)

[2010 admission onwards]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. What do you mean by transposition of long transmission lines ? What is its importance in transmission system ?
2. What is tuned power lines ?
3. What is string efficiency ? Give its importance.
4. What is effective grounding process ?
5. Write the advantages of HVDC transmission system.

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Derive the equation for inductance of a 2-wire line.
7. Derive the ABCD constants for medium lines using nominal T method.
8. Derive the equation for capacitance in single core cables.
9. What are the factors affecting corona ?
10. Explain different types DC links.

(5 × 5 = 25 marks)

Turn over



Part C

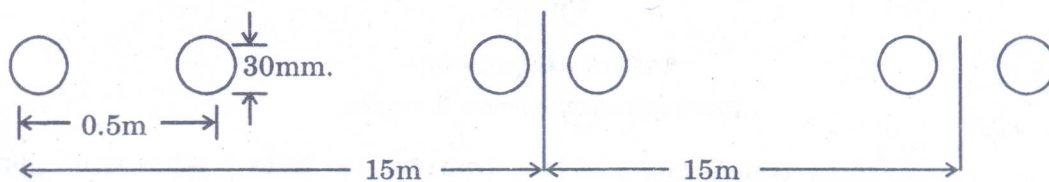
Answer **all** questions.

Each question carries 12 marks.

11. Derive the equation for inductance in composite conductors.

Or

12. A 500 KV line has a bundling arrangement of two conductors/phase as shown in figure below. Compute the reactance/phase of this line at 50 Hz. Each conductor carries 50% of the phase current. Assume full transposition.



13. Derive the ABCD constants for long transmission lines vigorous solution is required.

Or

14. A 3 ϕ 50 Hz transmission line is 400 km long. The voltage at the sending end is 220 kV. The line parameters $r = 0.125 \Omega/\text{km}$, $x = 0.4 \Omega/\text{km}$ and $y = 2.8 \times 10^{-6} \text{ S}/\text{km}$. Find :

- The sending end current and receiving end voltage when there is no-load on the line.
- The maximum permissible line length if the receiving end no-load voltage is not to exceed 235 kV.
- For part (i) the maximum permissible line frequency, if the no-load voltage is not to exceed 250 kV.

15. Explain different types of insulators. Explain the reasons for failure of insulators.

Or

16. Explain two methods for location of faults in UG cables.



17. Explain different grounding methods.

Or

18. A 3-phase 220 kV, 50 Hz transmission line consists of 1.5 cm radius conductor spaced 2 m apart in equilateral triangular formation. If the temperature is 40°C and atmospheric pressure is 76 cm. Calculate the corona loss/km of the line. Take $m_0 = 0.85$.

19. Explain the different interconnection methods of HVDC into AC system. Mention its advantages and disadvantages.

Or

20. Explain (a) SVC ; (b) TCR ; (c) UPFC.

(5 × 12 = 60 marks)