

LIB
22/11/13 FN

Reg. No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Question Paper Code : 31402

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Fifth Semester

Electrical and Electronics Engineering

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

(Regulation 2008/2010)

(Common to PTEE 2303 – Transmission and Distribution for B.E.(Part-Time)
Third Semester – Electrical and Electronics Engineering – Regulation 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Give reason why the transmission lines are three phase 3 wire circuits while distribution lines are three phase 4 wire circuits.
2. What is meant by sag?
3. A three phase transmission line has its conductor at the corners of an equilateral triangle with side 3 m. The diameter of each conductor is 1.63 cm. Find the inductance per phase per km of the line.
4. What is meant by Disruptive critical voltage?
5. Define voltage regulation of transmission line.
6. What is Ferranti effect?
7. How does grading ring improve string efficiency?
8. Give the relation for insulation resistance of a cable.
9. What is the function of isolators?
10. What is the need of an earthing system?

PART B — (5 × 16 = 80 marks)

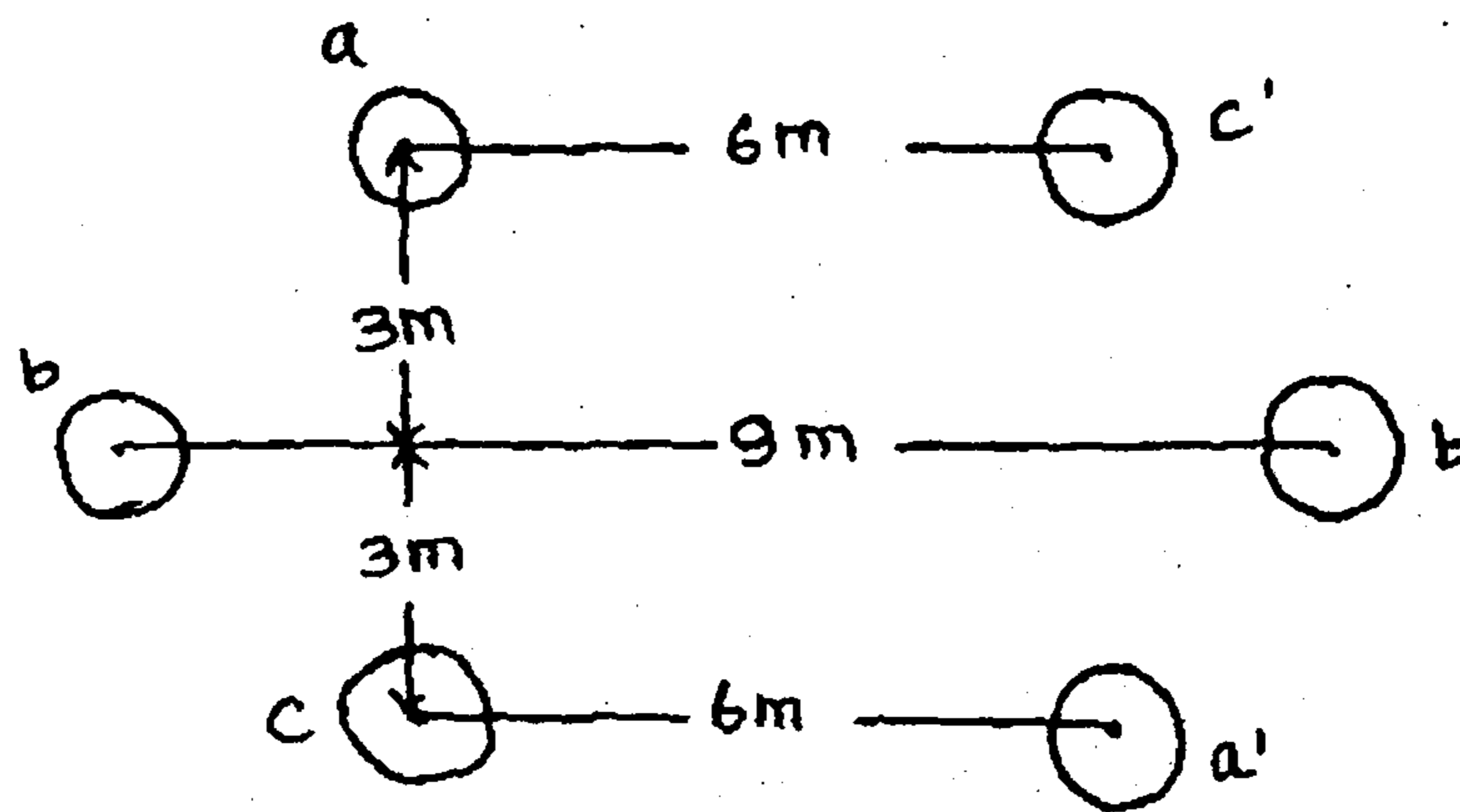
11. (a) (i) Draw and explain the structure of electric power system indicating the voltage level in each transmission levels. (10)
(ii) Explain the factors affecting the sag. (6)

Or

- (b) (i) Advantages EHVAC and HVDC transmission system. (8)
(ii) Deduce an approximate expression for sag in overhead lines when supports are at equal levels. (6)
(iii) List out the objectives of FACTS. (2)
12. (a) (i) Deduce an expression for capacitance of three phase transmission line with unsymmetrical spacing. (Transposed conductors) (10)
(ii) Explain about skin and proximity effects. (6)

Or

- (b) (i) A three phase circuit line consist of 7/4.75 mm hard drawn copper conductors. The arrangement of the conductors is shown in figure. The line is completely transposed. Calculate inductive reactance per phase per km of the system. (12)



Double circuit line

- (ii) Explain about interference between power and communication circuits. (4)
13. (a) A three phase, 50 Hz transmission line, 40km long delivers 36MW at 0.8 power factor lagging at 60 KV (phase). The line constants per conductor are, $R = 2.5 \Omega$, $L = 0.1 \text{ H}$, $C = 0.25 \mu\text{F}$. Shunt leakage may be neglected. Determine the voltage, current, power factor, active power and reactive voltamperes at the sending end. Also determine the efficiency and regulation of the line using nominal π method. (16)

Or

- (b) Write short notes on the following :
- (i) Surge impedance loading. (6)
(ii) Power angle curve. (6)
(iii) Loadability limits based on thermal loading. (4)

14. (a) (i) Why are insulator used with overhead lines? Discuss the desirable properties of insulators. (6)
- (ii) An insulator string for 66 KV lines has 4 discs. The shunt capacitance between each joint and metal work is 10% of the capacitance of each disc. Find the voltage across the different disc and string efficiency. (10)

Or

- (b) (i) Describe an experiment to determine the capacitance of a belted cable. (10)
- (ii) A 33 KV single core cable has a conductor diameter of 1 cm and a sheath of inside diameter 4 cm. Find the maximum and minimum stress in the insulation. (6)

15. (a) Explain the following system of distribution :

- (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)