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Question Paper Code : 80502

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Fifth Semester

Electrical and Electronics Engineering

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

(Regulations 2008/2010)

(Common to PTEE 2303 — Transmission and Distribution for B.E.(Part-Time) Third Semester — Electrical and Electronics Engineering — Regulations 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. How inductance and capacitance of a transmission line are affected by the spacing between the conductors?

4. What are composite conductors?

5. Define Ferranti effect.

6. Define Voltage stability.

7. Enumerate the different types of insulators used for overhead transmission lines.

8. How are cables classified based on an operating voltage?

9. State the advantages and disadvantages of having two circuit breakers in duplicate bus-bar system.

10. What is the purpose of inter-connector in a dc ring main distributor?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Draw a single line diagram of a typical ac. 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)

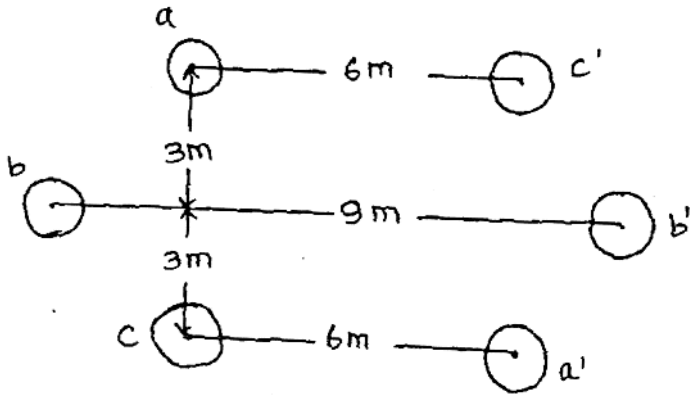
(ii) Derive an approximate expression for sag in overhead lines when supports are at equal levels. (8)

12. (a) (i) 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 3-phase, 50 Hz power transmission line has line resistance of 30 Ω and inductive reactance of 70 Ω per phase. The capacitive susceptance is 4×10^{-4} mho per phase. If the load at the receiving end is 50 MVA at 0.8 pf lagging with 132 kV line voltage, calculate

(i) voltage and current at sending end

(ii) regulation and

(iii) efficiency of the line for this load.

Use nominal π -method. (16)

Or

(b) (i) Explain Ferranti effect with relevant phasor diagram. (6)

(ii) What is power circle diagram? With necessary equation explain the construction of power circle diagram. (10)

14. (a) An insulator string consist of three units, insulator nearest to the line having a safe working voltage of 20 kV. The ratio of self to shunt capacitance is 6:1. Determine the line voltage and string efficiency. (16)

Or

(b) (i) List out the properties of insulating materials used for cables. (6)

(ii) What are the advantages of underground cables over overhead lines? (10)

15. (a) Draw and explain the single line diagram, showing the location of substation equipments for the following bus bar arrangements:

(i) Single bus scheme

(ii) Single bus-bar with sectionalizing scheme

State the merits and demerits of each scheme. (8 + 8)

Or

(b) (i) Explain the reasons leading to the general practice of earthing the neutral point of a power system. Discuss the relative merits of earthing it (1) solidly and (2) through a resistance. (10)

(ii) Write short notes on 'earthing practises in a substation' (6)

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