

Government College of Engineering, Aurangabad
(An Autonomous Institute of Government of Maharashtra)

T.E. (EEP) Examination
End Semester Examination

EE343 : Power System Analysis

Time: Three Hours

Date: 19 NOV 2016

Max.Marks:60

“Verify the course code and check whether you have got the correct question paper”

N.B:-

1. Attempt any four questions
2. Figures to the right indicate full marks
3. Assume suitable data if necessary
4. Use of non-programmable calculator is allowed

Q1.

- a) A 100 MVA 33kV 3-phase generator has a subtransient reactance of 15%. The generator is connected to the motors through a transmission line & transformers as shown in fig.1. The motors have rated inputs of 30 MVA, 20 MVA & 50 MVA at 30 kV with 20% subtransient reactance. The 3-phase transformers are rated at 110 MVA, 32 kV Δ /110 kV Y with leakage reactance 8%. The line has a reactance of 50 ohms. Selecting the generator rating as the base quantities in the generator circuit, evaluate the corresponding p.u. values & draw the reactance diagram. **(9M)**
- b) What are the advantages of p. u. system? **(6M)**

Q2.

- a) A 3 phase, 300 km long overhead transmission line has a resistance 48.7 ohm/phase, inductive reactance of 80.2 ohm/phase and capacitance is $8.42 \times 10^{-3} \mu\text{F}/\text{km}$. It supplies a load of 13.5 MW at a voltage of 88 kV and p.f. of 0.9 lag. Find the sending end voltage, current, power angle and regulation using nominal T method. **(8M)**
- b) What is skin effect & proximity? Why skin effect is absent in d. c. system? **(7M)**

Q3.

- a) A 4 bus system has been shown in figure 2. The line impedances are given in Table shown below. Determine Y_{BUS} **(7M)**

Line No.	R (p.u)	X (p.u)
X_{12}	0.05	0.15
X_{13}	0.10	0.30
X_{23}	0.15	0.45
X_{24}	0.10	0.30
X_{34}	0.05	0.15

- b) Compare Gauss Siedel & Newton Raphson method. **(8M)**

Q4.

- Fig.3 shows an arrangement of conductors for a 1 phase supply, the current being equally divided between conductors a and a' and between conductors b and b'. If the diameter of each conductor is 8 mm find the inductance per km of the line. (8M)
- What is the effect of unsymmetrical spacing of conductors in 3-phase transmission line? How it is taken care of? (7M)

Q5. Draw & explain zero sequence network for the transformer with i) Star- Delta with grounded neutral ii) Star- Star with primary neutral grounded iii) Delta-Delta connection (5*3)M

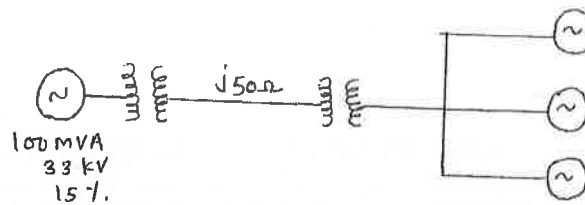


Figure 1

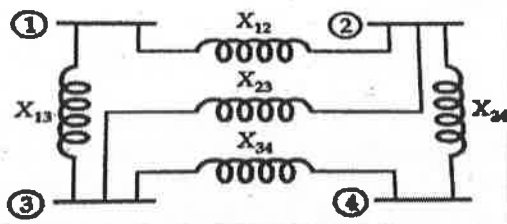


Figure2

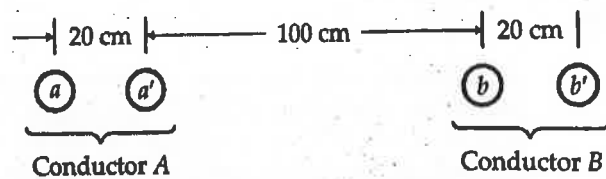


Figure3