

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

T.E. (EEP) Examination
End Semester Examination

EE 304: Power System Analysis

Time: Three Hours

Date: **1.9.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) What is the effect of unsymmetrical spacing of conductors in a 3 – phase transmission line? **(6M)**
b) Show how regulation & efficiency are determined for medium lines using Nominal Pi method. **(9M)**

Q2. a) Determine the regulation and efficiency of transmission for a 3-phase, 100 km, 50 Hz transmission line delivering 20MW at 0.8 p.f lag and 66 kV to a balanced load. The inductive reactance is 35.1 ohm per phase and capacitive reactance is 0.995 μ F per phase. Assuming the total resistance of the line to be 10 ohm/phase, use nominal T method. **(10M)**
b) What is Ferranti effect? **(5M)**

Q3. a) The three-phase power and line-line ratings of the electric power system shown in Figure 1 are given below.

G_1 :	60 MVA	20 kV	$X = 9\%$
T_1 :	50 MVA	20/200 kV	$X = 10\%$
T_2 :	50 MVA	200/20 kV	$X = 10\%$
M :	43.2 MVA	18 kV	$X = 8\%$
Line:		200 kV	$Z = 120 + j200 \Omega$

Draw an impedance diagram showing all impedances in per unit on a 100-MVA base. Choose 20 kV as the voltage base for generator. **(10M)**

b) What are the advantages of p.u. system? **(5M)**

Q4.a) Compute $1-a^2-a$ in polar form. **(4M)**

- b)** Obtain the symmetrical components for the set of unbalanced voltages $V_a = 300 \angle -120^\circ$, $V_b = 200 \angle 90^\circ$, and $V_c = 100 \angle 30^\circ$. Draw the phsor diagram. **(6M)**
- c)** Explain the different buses of power system. **(5M)**

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 (15M)

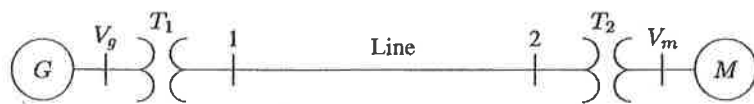


Fig. 1