COLLEGE OF ENGINEERING & TECHNOLOGY

Department : **Electrical & Control Engineering**

Lecturer : **Prof. Samah El Safty**

Course : **Power System II**

Course Code : **EE 441** **Marks** : **40**

Date : **10/1/2016** **Time** : **2 hour**

Final Exam

Answer the following questions

1. For the network shown below in figure 1, find the sub-transient fault current in per unit if a three phase fault occurred at bus 2. Assume that no current is flowing prior to the fault and that the pre-fault voltage at bus 2 is 1 ∟0 per unit. All values in the figure are impedances in p.u.

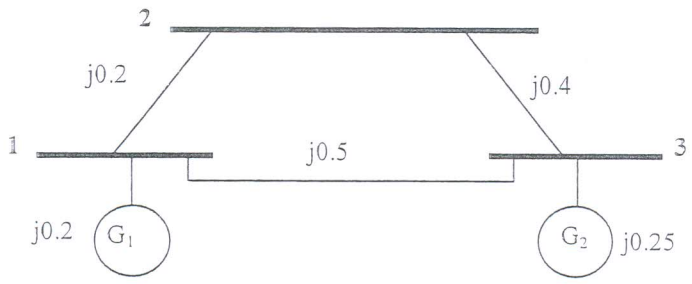

Figure 1

(8 Marks)*[A18]*

2. The line-line voltages in an unbalanced three phase star connected supply are $V_{AB}=600\angle 36.87^0$, $V_{BC}=800\angle 126.87^0$, and $V_{CA}=1000\angle -90^0$. A Y-connected load with a resistance of 37 Ω per phase is connected to the supply. Determine:

a) The symmetrical components of the line voltages
b) The symmetrical components of the phase voltages
c) The line currents

(8 Marks) *[B1]*

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3. A power system is shown in Figure 2, all p.u quantities are on the base of each item. Convert the reactances to a common 100 MVA base and voltage 12.5 kV at generator 1. Form positive, negative and zero network showing the reactances on them. If single line to ground fault occurred at terminal of generator 2, calculate the subtransient fault current.

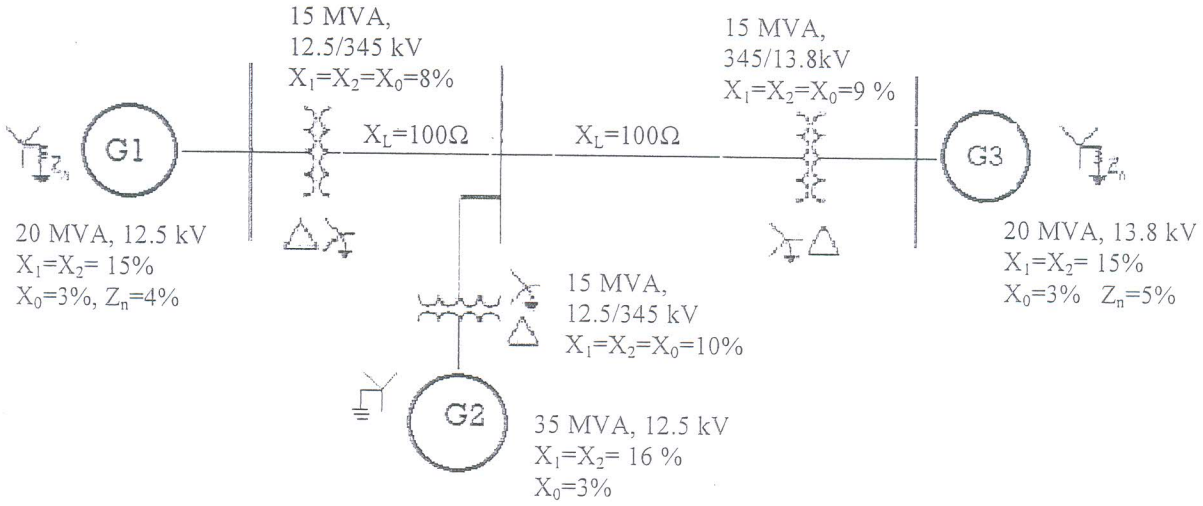

Figure 2

(14 marks) *[A4,A18,B2]*

4. A generator having H= 6 MJ/MVA, 50 Hz is delivering power of 1 per unit to an infinite bus through a purely reactive network. The maximum power that could be delivered is 2.5 per unit. A fault occurred reducing the generator output power to zero. When the fault is cleared, the original network conditions again exist. Determine the critical clearing angle and the critical clearing time.

(10 Marks) *[A4,B11]*

GOOD LUCK

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