King Saud University
Department of Electrical Engineering
Power Systems Operation and Control (EE 585)

First Semester 1435/1436 Second Midterm Exam Time Limit: 1.5 H

الاسم: الرقم:

Question 1:

The Y-admittance matrix of a 4-bus power system shown in Fig. 1, (neglecting losses), is given by

$$Y_{BUS} = j\begin{bmatrix} -20 & 0 & 10 & 10 \\ 0 & -15 & 8 & 7 \\ 10 & 8 & -18 & 0 \\ 10 & 7 & 0 & -17 \end{bmatrix}$$

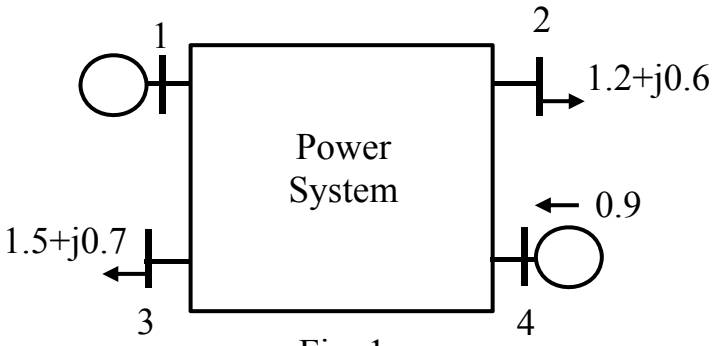

Fig. 1

All values are per unit.

a) Perform a DC load flow for this system.
b) Perform a fast-decoupled load flow for this system. Use the solution in part (a) as initial guess.

Question 2:

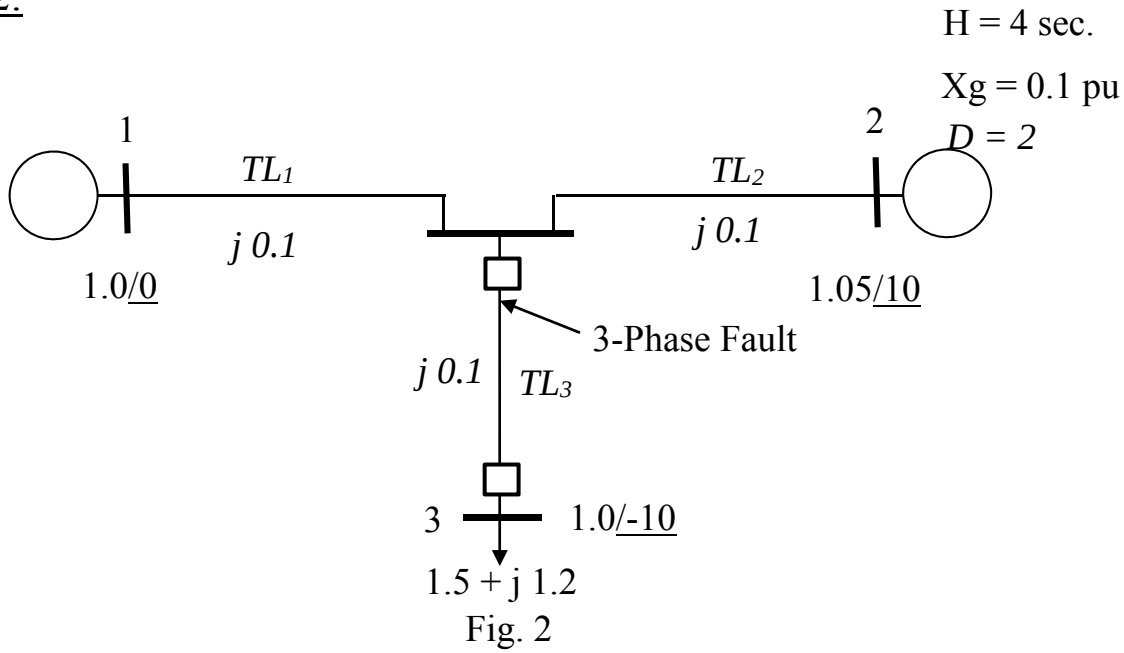

Fig. 2

In the system shown in Fig. 2, assume a 3-phase fault to occur at the sending-end of TL3, which lasted for T_C =0.05 sec. Study the transient stability of this system. Write a Mathcad program to solve it.