Please write your FULL NAME clearly. Submit the softcopy of your solutions by 27 April 2020 (Monday).

Written or typed solution is accepted.

Assignment 4

Consider the single-machine infinite-bus power system shown in the figure. The generator is delivering a complex power S_0 p.u. to the infinite-bus. The three-phase fault reactance is X_F. All reactance of the system are in per unit on a common base. *E'* is the constant internal voltage of the generator.

1. Find the power-angle equation (P_e-δ equation). (The parameter *a* indicates the fault location. The parameter *a* belongs to the range of [0, 1].)

   (15 Marks)

2. Discuss the relationships among P_e, X_F and *a*.

   (15 Marks)