EIGHTH SEMESTER   **B.TECH EE/EL**
MID SEMESTER EXAMINATION   **MARCH. 2019**
EE/EL-404, POWER SYSTEM DYNAMICS AND STABILITY
Time: 01 Hr 30 Min   **Max. Marks: 20**

Note: Answer all questions. Assume suitable missing data, if any.

1. Distinguish between steady state, dynamic and transient stability of synchronous machine. Develop the expression for the real and reactive power developed for a synchronous machine connected to an infinite bus and hence obtain the power angle diagram.   3

2. What are the causes of disturbances in synchronous machines? Discuses the Phenomena of hunting in synchronous machines. What are the effects of rotor oscillations on the performance of synchronous machine?   3

3. Starting from the first principle derive the Swing equation of a synchronous machine. Define Inertia constant.   3

4. Draw the diagram to illustrate the application of the equal area criterion to study the transient stability for the following cases:
   a. A sudden increase in the input of generator
   b. A switching operation causing the switching out of one of the circuits of a double circuit line feeding an infinite bus.   4

5. A 50 Hz generator of reactance 0.8 pu is connected to an infinite bus through a line of 0.4 pu. reactance E=1.05 pu. V=1.0 pu. The inertia constant is 4MJ/MVA. The generator s loaded to 70% of maximum power limit. Find the frequency of natural oscillations.   4

6. A large 3 phase cylindrical rotor alternator is delivering 1.0 pu. power to an infinite bus through a transmission network. The maximum power which can be transmitted for pre fault, during fault and post fault conditions are 1.8pu, .04 pu and 1.3 pu. Find the critical clearing angle.   3