

Exam.Code:1018
Sub. Code: 7784

1059
M.E. Electronics Engineering (Power System)
Second Semester
EE-8201: Power System Dynamics and Stability

Time allowed: 3 Hours

Max. Marks: 50

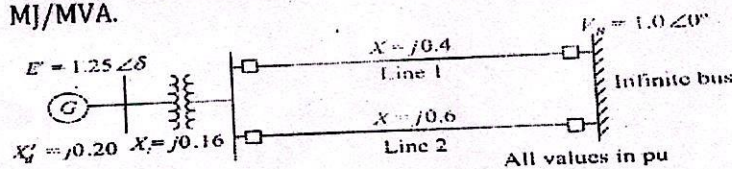
NOTE: Attempt any five questions.

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Q.1. How is dynamics of a power system represented in stability studies? What is the effect of prime mover in the dynamics of a system? Develop a prime mover model and represent it with the help of block diagram. [10]

Q.2. Differentiate the small signal stability with large signal stability of a system. How can we solve these stability problems? Hence explain Euler's method of stability assessment [10]

Q.3. A synchronous machine is supplying a real power of 0.9 p.u. to an infinite bus as shown in the Figure below. A temporary 3-phase fault occurs in line 2 at close to the bus bar. Find the critical clearing angle and time if the fault is cleared by simultaneous opening of the breakers at both ends on the line. The power frequency is 50 Hz and inertia constant of the generator is 3.5 MJ/MVA. [10]



Q.4. Give the significance of voltage stability in a system. Elaborate the transmission and load aspects of it. Discuss PV curve and comment upon the stability of a system. [10]

Q.5. Why is load modeling important in stability studies? Hence elaborate the ZIP load model and induction machine load model as used in stability studies. [10]

Q.6. Explain how stability studies can be explained by energy function approach. Hence derive the expression for energy function and discuss its various components. [10]

Q.7. Develop linearized single machine infinite bus (SMIB) system as applied for small signal stability studies. Hence deduce the condition to check the stability of the system when there is damper winding present in the synchronous generator. [10]

Q.8. Derive the swing equation for a machine connected to an infinite bus and extend it for a two machine system. [5]

a) Explain the concept of sensitivity of voltage to the reactive power in a system. [5]
b) Hence discuss the Q-V curve and comment upon the stability.

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