

TEE-601 99

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Paper Code & Roll No. to be filled in your Answer Book

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B. Tech. EEE

UTU (EVEN SEM.-VI) Examination-2015

POWER SYSTEM ANALYSIS*Time : 3 Hrs./**[Max. Marks :100***Note: Attempt All Questions. All Questions Carry Equal Marks.**

1. Attempt any four parts: (5×4=20)
 - a) What is single line diagram? Define per unit system.
 - b) What is load flow study. Define voltage controlled bus.
 - c) Discuss the step by step method of formation of Y_{bus} .
 - d) What is meant by fault? How the faults are classified?
 - e) How stabilities studies are classified?
 - f) What are the basic assumptions made in fault calculation?

2. Attempt any four parts : (5×4=20)
 - a) State from the first principles show that surge behaves as travelling waves.

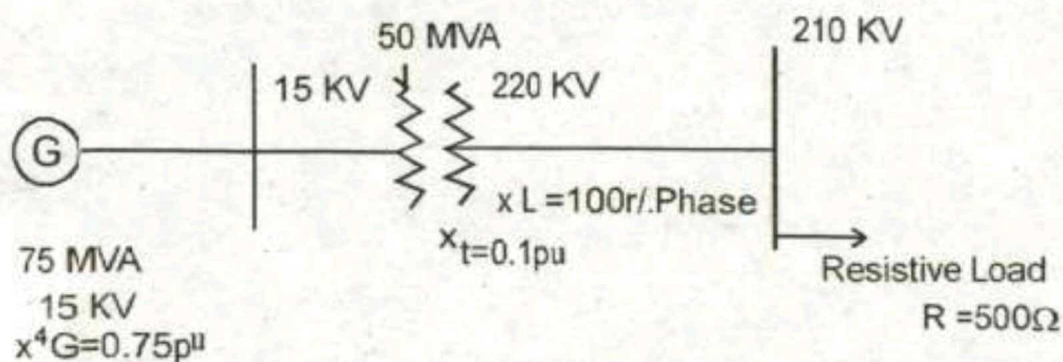
- b) Using equal area criterion, discuss about the transient stability of a power system when sudden loss of one of parallel lines occurs in the system.
- c) Derive the expression for the surge impedance of a transmission lines.
- d) Explain the methods of improving power system stability.
- e) What are the advantages of Y_{bus} over Z_{bus} ?
- f) What is meant by symmetrical components?

3. Attempt any two parts: (10×2=20)

- a) Derive a necessary equation to determine the fault current for a single line to ground fault. Draw a diagram showing the inter-connection of sequence networks.
- b) A single phase resistive load of 100k VA is connected across lines b-c of a balanced supply of 3kV. Compute the symmetrical components of the line currents.
- c) A loss free generator supplies 40 MW to an infinite bus. The steady state limit of the system being 100 MW. Determine whether generator will remain in synchronism if prime mover input is abruptly increased by 30 MW

4. Attempt any two parts. (10×2=20)

- a) Derive swing equation used for stability studies in power system
- b) For the system given below in fig. determine the generator voltage.



- c) Discuss the zero sequence network for all possible transformer connection.

5. Attempt any two parts: (10×2=20)

- a. Distinguish between steady state, transient and dynamic stability.
- b. Discuss the reflection and refraction of a travelling wave drawing Bewlay's lattice diagram. Take a suitable example for explanation.
- c. A 50 MVA, 11kv three-phase synchronous generator was subjected to different type of fault. The currents are as follows :

LG faults = 4200A ; LL faults 2600 A ; LLL faaults 2000 A.

The generator neutral is solidly grounded. Find the per unit values of the three sequence reactance of the generator.

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