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BEE 3603

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Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 33326 Roll No.

B. Tech. Examination 2021-22

(Even Semester)

POWER SYSTEM - II

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION – A

1. Attempt all parts of the following : 8×1=8

   (a) What do you mean by single line diagram of a power system?

   (b) Define per unit system.

   (c) Define sub transient reactance.

   (d) Explain the swing curve.

(e) Explain the matrix partitioning in load flow study.

(f) Explain the methods of improving steady state stability.

(g) Define circuit breaker.

(h) Define sequence impedance.

SECTION – B

2. Attempt any two parts of the following : 2×6=12

(a) Discuss per unit system. How are the base values choosen in representation of a power system?

(b) A double line to ground fault occurs on phase b and c of an unloaded generator. Derive a sequence network representation of this condition and determine the fault condition.

(c) Derive and discuss equal area criterion for transient stability analysis of a machine connected to an infinite bus bar.

(d) Draw flow chart of Newton Raphson method for load flow studies including PV buses. Explain each block of the chart.

SECTION – C

Note :– Attempt all questions. Attempt any two parts from each questions. $5 \times 8 = 40$

3. (a) Describe single line diagram representing synchronous machines transformers and feeders from generating end to distributing end. Discuss about impedance and reactance diagram with examples.

(b) What are the merits and demerits of per unit system.

(c) Derive the sequence impedances for a fully transposed transmission line and show that they exist in decupled form.

4. (a) Write short notes on the reactances of an alternator when sudden 3-phase short graint occurs on its terminals.

(b) Develop the connection of sequence network when a line to line fault occurs in a power system.

(c) What are the methods of Z bus formulation? Discuss the step by step programmable technique for Z bus formulation indicating various types of modifications.

5. (a) Explain the various factors affecting transient stability. What are the different methods for improvement?

(b) Describe the point by point solution technique of swing equation for the transient stability of a power system.

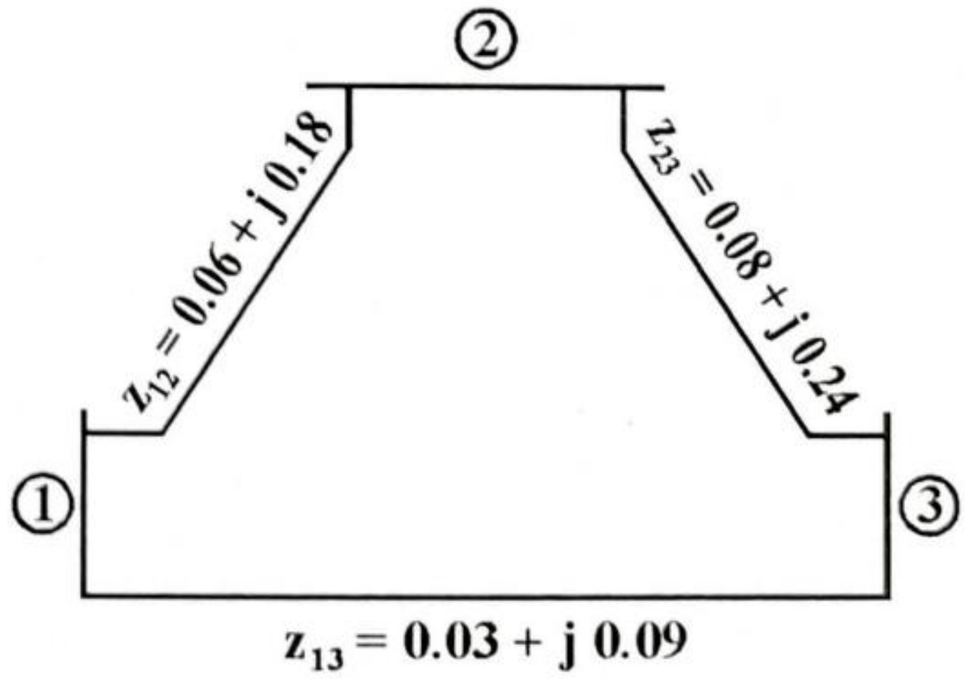
(c) Discuss the steady state stability using swing equation of a machine connected with infinite bus.

6. (a) Formulate the mathematical model for load flow analysis of a power system using Gauss-Siedal method. Also give detailed steps for implementing it considering also the voltage controlled buses.

(b) State the assumptions utilized in deriving fast decoupled load flow equations.

(c) Determine Y_{bus} for the 3-bus system shown in figure. The line series impedances are as follows :

Line (bus to bus)	Impedance (pu)
1 – 2	0.06 + j 0.18
1 – 3	0.03 + j 0.09
2 – 3	0.08 + j 0.24



Neglect the shunt capacitances of the lines.

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