

610502/610602

Roll No. _____

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B. Tech. VI - Sem. (Main) Exam. (Academic Session 2021-2022)

Electrical & Electronics Engineering

6EX4 - 02/6EE3-02 Power System - II

Common with EEE & EE

Time: 2½ Hours

Maximum Marks: 120

Min. Passing Marks:

Instructions to Candidates:

Part - A: Short answer questions (up to 25 words) 6 x 3 marks = 18 marks.
Candidates have to answer six questions out of ten.

Part - B: Analytical/Problem solving questions 3 x 10 marks = 30 marks.
Candidates have to answer three questions out of seven.

Part - C: Descriptive/Analytical/Problem Solving questions 3 x 24 marks = 72 marks.
Candidates have to answer three questions out of five.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL

2. NIL

PART - A

- ✓ Q.1 What is spot pricing?
- ✓ Q.2 What are the electricity market models?
- ✓ Q.3 What do you understand by SCADA system?
- ✓ Q.4 What is the need of wide area measurement systems?
- ✓ Q.5 Write short note on Phasor Measurement Unit (PMU).

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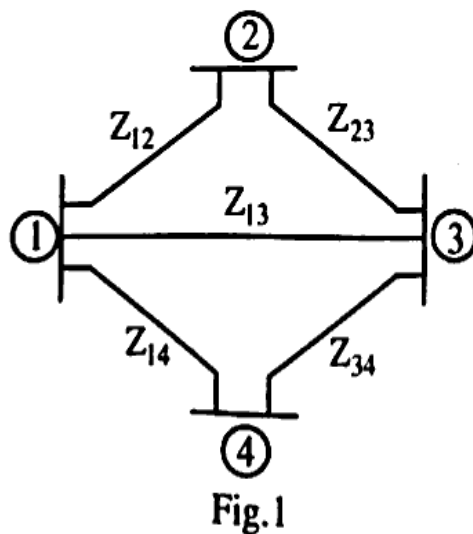
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- Q.6 What do you understand by frequency dependent loads?
- Q.7 What is the effect of generation rescheduling on stability?
- Q.8 What do you understand by power angle curve?
- Q.9 What are the basic steps for calculating bus admittance matrix?
- Q.10 Draw the basic structure of power system.

PART - B

- Q.1 What do you understand by equal-area criterion of stability?
- Q.2 Determine bus admittance matrix (Y_{bus}) for the 4-bus system shown in figure 1. The line series impedance are as follows -

Line (bus to bus)	Impedance (p.u.)
1 - 2	$0.25 + j1.0$
1 - 3	$0.20 + j0.8$
1 - 4	$0.30 + j1.2$
2 - 3	$0.20 + j0.8$
3 - 4	$0.15 + j0.6$



Q.3 Derive the static load flow equations.

Q.4 Describe the phenomenon of loss of synchronism in a single machine infinite bus system.

Q.5 What do you understand by demand side management?

Q.6 Explain the working of SCADA systems. Also discuss the limitations of SCADA.

Q.7 Mention the various methods of voltage control. Explain any one method in detail.

PART - C

Q.1 A three-phase overhead line has resistance and reactance per phase of 25Ω and 90Ω respectively. The sending-end voltage of 145 kV, while the load-end voltage is maintained at 132 kV for all loads by an automatically controlled synchronous phase modifier. If the MVA_r of the modifier has same value for zero load as for a load of 50 MW, find the rating of the modifier and the power factor of this load.

Q.2 Explain Newton-Raphson method for solving the power-flow equations.

Q.3 Explain the Runge-Kutta method for solving and analysis of swing equation.

Q.4 Explain the various states of power system security perspective.

Q.5 Write a detail note on -

(a) Tap-changing transformer

(b) STATCOM