

Roll No.

Total Page No. : 3

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ELECTRICAL AND ELECTRONICS
ENGINEERING
(6EE4-02) - POWER SYSTEM-II
COMMON WITH EEE & EE

Time : 3 Hours]

[Max. Marks : 120

[Min. Passing Marks : ??

Instructions to Candidates : Part – A: Short answer type questions (up to 25 words) 10×2 marks = 20 marks. All ten questions are compulsory.

Part – B: Analytical/Problem Solving questions 5×8 marks = 40 marks. Candidates have to answer 5 questions out of 7.

Part – C: Descriptive/Analytical/Problem Solving questions 4×15 marks = 60 marks. Candidates have to answer 4 questions out of 5.

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 materials is permitted during examination. (Mentioned in form No. 205)

1 _____

2 _____

PART A

1. Draw the basic structure of a power system. [2]
2. What are the basic steps for calculating Bus Admittance Matrix ? [2]
3. What are the various numerical methods for finding the solution of non-linear algebraic equations ? [2]
4. What do you understand by power angle curve ? [2]

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(1)

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5. What is the effect of generation rescheduling on stability? [2]
6. What do you understand by frequency dependent loads? [2]
7. How excitation system control acts in synchronous generators? [2]
8. What do you understand by Phasor Measurement Units (PMU)? [2]
9. What is wide-area measurement systems? [2]
10. What do you understand by spot pricing? [2]

PART B

1. Determine bus admittance matrix (y_{bus}) for the 4-bus system shown in figure Q1. The line series impedances are as follows :

Line (bus to bus)	Impedance (pu)
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	$0.15 + j0.6$

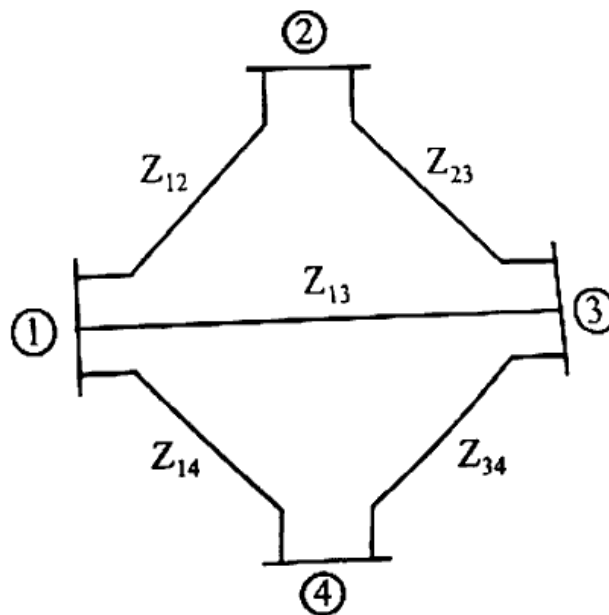


Fig. Q1

(2)

2. Derive the static load flow equations. [8]
3. Describe the phenomenon of loss of synchronism in a single machine infinite bus system. [8]
4. What do you understand by equal-area criterion of stability? [8]
5. What are the various methods of voltage control? Explain any one method. [8]
6. Explain the working of SCADA systems. Also discuss the limitations of SCADA. [8]
7. What do you understand by demand side management? [8]

PART C

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 MVAR of the modifier has the 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. [15]
2. Explain the following : [7½]
 - (a) Tap changing transformer [7½]
 - (b) STATCOM. [15]
3. Explain the various states of power system security perspective. [15]
4. Explain the Runge-Kutta method for solving and analysis of swing equation. [15]
5. Explain Newton-Raphson method for solving the power flow equations. [15]
