

Total No. of Questions : 12]

SEAT No. :

P1844

[Total No. of Pages : 3

[5059]-143

B.E. (Electrical)

MODELING OF ELECTRICAL SYSTEMS

(2008 pattern) (Elective - IV)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) *Answer any three questions from each Section.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

SECTION - I

- Q1)** a) Explain per unit system and normalization with reference to modeling of synchronous machine. [8]
- b) Write short note on Park's transformation. [8]

OR

- Q2)** Enlist the following used in modeling of synchronous machine. [16]
- a) Flux linkage equations.
 - b) Voltage and current equations.
 - c) Electrical and mechanical equations.

- Q3)** a) Explain the formulation of state space equations in modeling of synchronous machine. [8]
- b) Explain in brief determination of machine parameters from manufactures data. [8]

P.T.O.

OR

- Q4)** a) Explain in detail the simplified model of synchronous machine. [8]
b) Write short notes on following : [8]
i) Equivalent circuit of synchronous machine.
ii) Sub transient and transient inductances.
iii) Time constants.

- Q5)** Explain in detail modeling of excitation system components. [18]

OR

- Q6)** Explain in detail modeling of complete excitation system. [18]

SECTION - II

- Q7)** a) Describe the circuit model of a three phase induction motor. [8]
b) Explain in detail linear transformation and phase transformation used in modelling of induction motor. [8]

OR

- Q8)** a) Write short notes on two axis models for induction motor. [8]
b) Explain the transformation to a reference frame in context with modeling of induction motor. [8]

- Q9)** Describe the procedure of finding voltage and current equations in stator reference frame and equation in rotor reference frame. [16]

OR

- Q10)** a) Explain the procedure of finding equations in synchronously rotating frame used in modeling of induction motor. [8]
b) Derive the torque equation to be used in modeling of induction motor. [8]

Q11) Write short notes on (Any 2) : **[18]**

- a) Three Winding Transformer Model.
- b) Load Modelling.
- c) Transformer model.

OR

Q12) Write short notes on : **[18]**

- a) Voltage dependence of equivalent loads.
- b) Derivation of equivalent load powers.
- c) Static load modelling for load flow studies.



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