Code No: NR410208 **NR**

IV B.Tech I Semester Supplementary Examinations, April/May 2005
COMPUTER AIDED DESIGN OF ELECTRICAL MACHINES
(Electrical & Electronic Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Explain the random search method and simplex unconstrained method and discuss their validity for optimal design of three phase induction motor?
2. Discuss in detail the mathematical formulation of unconstrained optimization problem and constrained optimization problem with suitable examples.
3. Describe the optimal design of DC machine armature and field system. Formulate the design method and identify the independent variables.
4. (a) Specify the variables used for optimal design of three phase induction motor and also explain the method of selection of these variables.
   (b) Explain the factors which affect the design of squirrel case motor rotor.
5. (a) Develop the algorithms for estimating the leakage reactances and no-load current of a three phase induction motor using computers.
   (b) Explain the factors which affect the selection of number of roles of stator in slipring induction motor.
6. (a) Discuss the different types of three phase windings and their limitations. While designing three phase alternators stator.
   (b) Explain the field winding design of a three phase salient pole alternator?
7. (a) Formulate the stator and rotor design equations for optimal design using computers for a 3-phase alternator.
   (b) How do we estimate the no load current of a transformer at the time of design using computers.
8. (a) Obtain the objective function and constraint functions of a three phase power transformer for computer aided design.
   (b) Describe the cooling methods of three phase power transformers.

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