Code No: NR410208 **NR**

IV B.Tech I Semester Supplementary Examinations, November 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

⋆ ⋆ ⋆ ⋆ ⋆

1. Explain the design synthesis program for initializing the optimization procedure with the help of neat flow chart. [16]

2. Discuss in detail the performance of different optimization methods by choosing suitable example and compare them. Suggest the suitable method for designing DC machine. [16]

3. Discuss the factors which effect the length of air gap, no. of poles, depth of armature slots while designing a D.C machine and also obtain the mathematical formulation. [16]

4. Obtain a constraint function for optimal design of dc machine in terms of losses in the machine and space factor for armature slots. [16]

5. Discuss in detail the method of obtaining the constraint functions for pull-out torque, starting torque and starting current from the fundamentals to obtain the optimal design of three phase induction motor? [16]

6. (a) How do we estimate the rotor bar current at the time of design in case of squirrel cage induction motors?
   (b) How do we formulate the guidelines for optimal design of slipring induction motor. [8+8]

7. (a) Develop the flow chart for optimal design of power transformer? Discuss in detail the various subroutines?
   (b) Discuss in detail the various cooling methods of power tranformers? [12+4]

8. (a) Mention the variables used and their selection for optimal design of three phase salient pole alternator?
   (b) Describe the objective function and constraint functions of a three phase alternator for computer aided design? [8+8]

⋆ ⋆ ⋆ ⋆ ⋆