M.E DEGREE EXAMINATIONS: OCTOBER / NOVEMBER-2008

Second Semester

POWER ELECTRONICS & DRIVES

P07PE 201: Computer Aided Design of Electrical Apparatus

Time: Three Hours   Maximum Marks: 100

Answer ALL Questions:-

PART A (20X2= 40 Marks)

1. To find a set of parameters consisting of all continuous functions of some other parameter that optimizes the objective function subjected to the prescribed conditions is known as
   (A) Static optimization   (B) Dynamic optimization
   (C) Both dynamic and static optimization (D) Neither dynamic nor static optimization

2. In machine design, the art of substitution of performance characteristics in the mathematical model to solve for the physical properties of the desired system is known as
   (A) Analysis   (B) Dynamics   (C) Synthesis   (D) Simulation

3. A self-restoring program in a computer aided machine design is a program
   (A) That is kept in the volatile memory   (B) That can be executed repeatedly
   (C) That can be easily called for   (D) That gets stored by itself.

4. In a profit-based economy, the element of cost of computer aided design procedures is subject to
   (A) Performance constraints   (B) Environmental constraints
   (C) Loss constraints   (D) Economic Constraints

5. The objective and constraint functions for an Engineering Optimization problem is
   (A) Highly linear   (B) Highly non-linear   (C) Highly dynamic (D) Highly stochastic

6. Which of the following methods is used for solution of unconstrained optimization   problem?
   (A) Random search method   (B) Heuristic search method
   (C) Cutting plane method   (D) Feasible direction method

7. In an electric motor, the magnetic flux density in the iron and the current density in the conductors   have an indirect constraint on
   (A) Power factor   (B) Efficiency   (C) Pull-out torque   (D) Size

8. In the solution of a non-linear programming problem, while selecting the initial point and initial penalty factors, it is desired that the starting point be as close to the feasible point as possible because
   (A) A rapid optimum design is obtained   (B) A rapid convergence is obtained
   (C) The computational time is more   (D) The contours of the function will be more

9. In an Induction machine, the objective function is
   (A) The equation for pull-out torque   (B) The equation for efficiency
   (C) The equation for temperature rise   (D) The sum of the costs of copper,iron an aluminium.

10. Which of the following variables is not a constraint to the Computer Aided Design of an Induction machine, normally?
    (A) Temperature rise
    (B) Current density in the stator conductor
    (C) Rotor current
    (D) Full load power factor.

11. Design automation can be carried to
    (A) Optimum efficiency
    (B) Optimum power factor
    (C) Maximum overload capacity
    (D) No limit

12. Of the following, which method is used for prediction of temperature rise in a three phase induction motor?
    (A) Lumped-parameter approach
    (B) Method of progressive realization
    (C) Godwin approach
    (D) Nodal approach

13. In AutoCAD software, a toolbar fly out
    (A) Displays additional tools that are related to the tool being selected
    (B) Starts a command as soon as it is clicked
    (C) Shows the menus in menu bar
    (D) Shows the pull-down menu.

14. In AutoCAD, tools that allow us to make changes to symbols or back ground drawings that are imported as external reference drawings is:
    (A) Reference   (B)Refedit   (C) Render   (D) Modify

15. In a 3-D drawing, wipe out is a
    (A) Hatching tool (B) Island detection tool (C) Masking tool (D) A space planning tool

16. In 3-D drawing using AutoCAD, the UCS icon tells you that,
    (A) You are currently in the layout tab space (B) You are in the making of a layout view port
    (C) the drawing is ready for display   (D) the drawing is ready to be plot style changed.

17. When should you set system variables?
    (A) All the time
    (B) Never
    (C) When you are bored
    (D) Only when you know what you are doing.

18. Visual Basic for Applications (VBA) is:
    (A) A stand-alone application   (B) A language   (C) Compiler   (D) De-bugger

19. What release of AutoCAD is implemented VBA?
    (A) AutoCAD R14   (B) AutoCAD 2000   (C) AutoCAD 1988   (D) AutoCAD 1999

20. As a good programming habit, an Option Explicit Statement is often placed at the beginning of the code to
    (A) Ensure that the concept is clear   (B) Ensure that all variables re declared
    (C) Ensure no cross linking of loops   (D) Ensure minimum execution time of the project.

PART B (5X12 = 60 Marks)

21 (a) (i) What do you mean by "Branching" in Computer Aided Design?   (5)

   (ii) Explain a typical design procedure for a rotating electrical machine through a flow chart.   (7)

OR

21(b) (i) Describe the analysis and synthesis approaches adopted in the design of electrical apparatus **(5)**

(ii) Enumerate and explain the various steps to be followed in developing computer aids for the design of electric machinery. **(7)**

22(a) (i) Give a brief classification of Optimization problems. **(5)**

(ii) Explain with the help of a flow chart, the solution of unconstrained optimization problem using any one method **(7)**

OR

22(b) (i) Discuss the algorithm for solution of a non-linear Programming problem using exterior penalty function method. **(7)**

(ii) Compare the performance of different methods available for optimization of electrical machine design. **(5)**

23(a) (i) What do you mean by optimum design of a three phase induction machine? Discuss the constraint functions normally used for Induction machines. **(3+4)**

(ii) Develop a flowchart for optimized design of an Induction machine **(5)**

OR

23(b) (i) Briefly explain the graphic input devices used in Computer Aided Drawing from the very beginning. **(6)**

(ii) Comment on the graphic output devices employed in Computer Aided Drawing. **(6)**

24(a) (i) What is AutoCAD? Explain the various parts of the AutoCAD window. **(6)**

(ii) Describe the standard AutoCAD method for subject selection. **(6)**

OR

24(b) (i) How Grid and Snap modes work together in AutoCAD? **(4)**

(ii) What is the significance of Lineweights in AutoCAD drawing? How the plot styles can be directly assigned to Layers and objects in AutoCAD? **(4+4=8)**

25(a) (i) Compare the customization options of Basic with AutoCAD? What are the benefits of automizing AutoCad? **(3+3=6)**

(ii) What is a stand-alone visual basic? Explain. **(6)**

OR

25(b) (i) What is a macro? How do you insert a Userform in AutoCad VBA? **(2+4)**

(ii) How do you load a project? Name three ways to run a program. **(3+3)**

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