

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2018****Subject Code:2160911****Date:04/12/2018****Subject Name:Computer Aided Analysis and Design for Electrical Engg.****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) State the possible parameters to be inputted to the CAD program as specifications. **03**
- (b) Discuss how Computer Aided Design process is beneficial compared to the conventional manual way to design. **04**
- (c) Discuss the procedural flow to compute total Ampere Turns for any electromagnetic device. **07**
- Q.2** (a) State classes for the type of rating electrical motors. State expression to estimate power rating of a motor based of particular loading pattern. **03**
- (b) Show how designing proper heat flow throughout the rotating machine is essential for proper functioning of the machine. Name the different types of ventilations? **04**
- (c) Consider the case of a choke coil seems to get saturated at load where it should display a linear nature. Discuss, how Finite Analysis helps to improve design to overcome above problem. Describe steps involved in process in brief. **07**
- OR**
- (c) How do you interpret role of FE Analysis tool in conventional Computer Aided Designing process? Explain following terms in respect to FE Analysis: **07**
- i) Meshing
- ii) Boundary conditions
- iii) Contour Analysis
- Q.3** (a) Discuss the qualities good magnetic material should contain. **03**
- (b) Discuss the algorithmic steps for optimal design. **04**
- (c) Illustrate a case of design optimization where FE Analysis of electrostatic field with appropriate diagrams. **07**
- OR**
- Q.3** (a) State the significance of specific Electric loading. **03**
- (b) Discuss the requirements of high conductive material. **04**

(c) Prepare a flow chart for Computer Aided Designing of a single phase transformer. 07

- Q.4** (a) Which are the main types of windings in transformers? 03
- (b) What is the purpose of dummy coils in armature winding design? In which type of armature winding design, it is used? 04
- (c) Draw a flowchart for design of starter for DC motor. 07

OR

- Q.4** (a) List out the criteria for selection of type of transformer out of core type and shell type. 03
- (b) What is the purpose of equalizer connections? In which type of armature winding design, it is used? 04
- (c) Draw flowchart for design of field regulator for DC motor. 07
- Q.5** (a) State factors to be considered while selection of airgap for DC machines. 03
- (b) Which parameters can be iterated within lower and upper bounds for the optimization of DC machine. 04
- (c) Explain Global coefficient matrix, skin and proximity effect in conductors. 07

OR

- Q.5** (a) State factors to be considered while selection of slot dimensions (depth, width, tooth width) for DC machines. 03
- (b) Which parameters can be iterated within lower and upper bounds for the optimization of power transformer. 04
- (c) Develop and discuss algorithmic steps to design of frame size and standard stampings for DC machines. 07
