

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**
