24320

B. Tech. (EEE) 6th Semester

Examination – May, 2015

COMPUTER ADDED ELECTRIC MACHINES

Paper : EE-314-F

Time : Three Hours]   *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 is *compulsory* and attempt any *one* question from each of *four* Sections.

1. (a) How the joints in a transformer effects the losses ?

   (b) Explain disadvantages of CAD.

   (c) What is difference between direct and indirect cooling ?

   (d) Why L.V. winding is provided near to core of the transformer ?

   (e) Differentiate Paramagnetic Materials and Ferromagnetic Materials.   20

SECTION – A

2. (a) Explain different insulating materials used in modern electrical machines.   10

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(b) What are the features and limitations of electrical machine designing ? 10

3. (a) Derive an expression for the temp. rise of electrical machine in terms of its heating time const and final temp. rise. 10

(b) Explain the nature of the temp. rise – time curve for an electrical machine. 10

SECTION – B

4. An 8 pole, volts, d.c. shunt generator with all field coils connected in series requires 5000 Ampere turns per pole. The cross sections of the poles including surface insulation is Rectangular (12 cm * 20 cm) and the available cross section on the spool for the winding is 10 cm * 2.5 cm. determine

(1) The cross sectional area of the conductor to be used.

(2) The number of turns per spool.

(3) Dissipation in watts per square centimeter based on the area of the outside surface of the coil.

Specific resistance of the circular conductor may be used as 2 * 10 ohm cm. insulation increases its diameter by 0.02 cm. Allow for a voltage drop in the field regulator of 50 volts. 20

5. (a) Explain the effect of slot opening on the flux distribution in the air gap of an electrical machine. 10

(b) Explain type of coefficient used in the MMF calculation of electrical machines. 10

SECTION – C

6. (a) Explain the basic designing aspects of rotating electrical machines. **10**

(b) Discuss designing aspects of synchronous machines. **10**

7. Determine for a 12.5 MVA, 6.6 KV 20 pole 50 Hz, 3 phase alternator suitable values For diameter at air gap, length of core, number of stator slots and stator conductors. Assume appropriate value for the missing design constants. **20**

SECTION – D

8. (a) Discuss the philosophy of computer aided design of electrical machines, mentioning the advantages and limitations in design. Give "flow chart" of designing a transformer by synthesis method. **10**

(b) Discuss the concept of optimization in designing of electrical machines. **10**

9. (a) Explain hybrid method of CAD. **10**

(b) Give a general procedure for optimization of design of electrical machines. **10**

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