

Advantages and limitations in design. Give "flow chart" of designing a transformer by Synthesis method. 10

(b) Discuss 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

Roll No.

24320

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COMPUTER ADDED ELECTRIC MACHINES

Time : Three Hours]

[Maximum Marks :75]

Before answering the question, 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) Distinguish between soft and hard magnetic materials with their applications.
- (b) Explain the difference between radiation and insulation.
- (c) Why is oil used in transformer ? What are the properties required of transformer oil ?

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- (d) Discuss modern trends in design and manufacturing techniques in electrical machines.
- (e) Explain magnetizing loadings. 20

SECTION – A

2. (a) Discuss the causes of insulation failure in electrical machine. 10
 (b) Explain different type of Enclosure for electric machines. 10
3. Initial temp. of transformer is 27 degree C. After two hours of operation at full load it is 57 degree C and after four hours run it is 72 degree C. Estimate the following: 20
 (a) Heating time constant.
 (b) Maximum final peak value of temp. at full load
 (c) Time in which transformer reach 5/6 th of its final value.

SECTION – B

4. An 8 pole, 230V, 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

- (a) The cross sectional area of the conductor to be used.
- (b) The number of turns per spool
- (c) Dissipation in watts per square centimeter based on the area of the outside surface E. J. of the coil.

Specific resistance of the circular conductor may be used as 2×10^{-8} 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) Discuss magnetic ckt of DC machine. 10
 (b) Differentiate Electrical circuit and magnetic circuit. 10

SECTION – C

6. When the performance was calculated at design stage of a poly phase induction motor. It was found to give poor power factor. Discuss the modification which can probably be made to the design for improving its performance. 20
7. Discuss Designing of transformer for minimum cost and over all dimension of transformer. 20

SECTION – D

8. (a) Discuss the philosophy of computer aided design of electrical machines, mentioning the

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