Exam.Code:0938
Sub. Code: 33803

2015

B.E. (Electrical and Electronics Engineering)

Eighth Semester

EE-808 (i): Electrical Machine Design

Time allowed: 3 Hours Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.

x-x-x

I. Answer the following:-

a) Define apparent flux density. State the relation between real and apparent flux density.

b) Write the expression for the power developed by an armature of rotating machine in terms of maximum gap density.

c) Why cooling tubes are provided in transformer?

d) What types of slots are preferred for the induction motor?

e) What is the limiting factor for the diameter of synchronous machine?(5x2)

UNIT - I

II. a) What do you understand by continuous, short time and intermittent ratings of an electrical machine? Explain with the help of suitable examples.

b) Derive the output equation of a rotating machine explaining all the terms. (2x5)

III. What are the main causes of temperature rise in electrical machines? Draw a well labelled diagram of each radial, axial and combined radial and axial ventilation system for electrical machines. (10)

IV. a) Obtain an expression for volt per turn in terms of output of the transformer. Write a note on factor k.

b) A 350 kW, 500V, 450 rpm, 6 pole dc generator is to built with an armature diameter of 0.87m and core length of 0.32m. The lap wound armature has 660 conductor. Calculate the specific electric and specific magnetic loadings. (2x5)

P.T.O.

UNIT - II

V. Estimate the stator core dimensions, number of stator slots and number of stator conductors per slot for a 100 kW, 3300 V, 50 Hz, 12-pole star connected slip using induction motor. Assume average gap density is 0.4 wb/m^2, conductors per meter = 25,000 A/m, efficiency = 0.9, power factor = 0.9 and winding factor is 0.96. Choose main dimensions to give overall design. (10)

VI. a) What do you mean by SCR as applied to alternator? How the value of SCR affects the design of alternator?

b) Explain the procedure for separation of D and L from the product D^2L while designing induction motors. (2x5)

VII. Write note on the following:-

a) Advantages and disadvantages of synthesis method of electrical machine design

b) Influence of air gap length on performance of synchronous machine (2x5)

x-x-x