Total No. of Questions : 4]

SEAT No. :

PF-310

[Total No. of Pages : 2

Apr.-26/TE/Insem-392
T.E. (Electrical Engineering)
COMPUTER AIDED DESIGN OF ELECTRICAL MACHINES
(2019 Pattern) (Semester - VI) (303149)

Time : 1 Hour] ***[Max. Marks : 30***

Instructions to the Candidates :

1) ***Answer Q1. Or Q2 and Q3 or Q4.***
2) ***Assume suitable data if wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Neat diagram must be drawn wherever necessary.***
5) ***Use of non-programmable calculator is permitted.***

Q1) a) Write important Specifications of three phase transformers as per IS 2026 (Part I). **[5]**

b) In the design of the transformer if L. V. winding is placed away from the core what are disadvantages of the same. **[4]**

c) Derive the equation for heating, temperature rise - time characteristics. Plot temperature rise - time characteristics. **[6]**

OR

Q2) a) List the heat dissipating modes. Explain with justification by which mode most of heat is dissipating? **[5]**

b) Explain the significance of mitred joints in the design of core of the transformers. **[4]**

c) Explain the functions of transformer auxiliaries : **[6]**

i) Tap changer, ii) Pressure release valve, and

iii) Breather and conservator.

Q3) a) Derive the condition for minimum cost of the transformer for the optimum transformer design. **[4]**

b) Explain why the core of the transformers is stepped. **[4]**

c) Estimate the main dimensions including winding conductor areas of a three phase delta-star core type transformer rated at 300 kVA, 6600/440 V, 50 Hz,. A suitable core of three steps having a circumscribing circle of 0.25 m diameter and leg spacing of 0.4 m is available, The emf per turn is 8.5 V. Assume a current density of 2.5 A/mm^2, a window space factor of 0.28 and stacking factor of 0.9. **[7]**

OR

P.T.O.

Q4) a) Derive the condition for minimum loss of the transformer for the optimum transformer design. **[4]**

b) Write short note on continuous disc type winding of transformers. **[4]**

c) Determine the main dimensions of the core of three phase 350 KVA, 11000/3300 V, Star-Delta, 50 Hz, core type transformer. Assume: Voltage per turn = 11, Maximum flux density = 1.25 Wb/m^2, Net cross section of core = 0.6 d^2, window space factor=0.27, Window proportion = 3: 1, current density = 250 A/cm^2. **[7]**