Total No. of Questions : 4]

SEAT No. :

PF201

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APR-26/SE/Insem-247

S.E. (Electrical Engineering) (Insem)

ELECTRICAL MACHINES-I

(2019 Pattern) (Semester - IV) (203146)

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

Instructions to the candidates:

1) ***Solve Q.1 or Q.2 and Q.3 or Q.4.***
2) ***Figures to the right side indicate full marks.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Assume suitable data if necessary.***
5) ***Use of non-programmable calculator is allowed.***

Q1) a) What are the losses taking place in the transformer? Derive the condition for maximum efficiency of the transformer. **[7]**

b) What is an autotransformer? Derive the equation for the saving of copper in the case of autotransformer as compared to two winding transformers along with the necessary diagram. **[8]**

OR

Q2) a) With neat circuit diagram explains open circuit and short circuit tests on a single-phase transformer for finding the voltage regulation and efficiency of the transformer. **[7]**

b) Sketch and explain the phasor diagram of the single-phase transformer at the ON load considering the effect of winding resistance and magnetic leakage. **[8]**

Q3) a) With proper connection and phasor diagrams describe the star/star connection of the three-phase transformer. Explain it in brief. **[7]**

b) Two l00-kW, single-phase transformers are connected in parallel both on the primary and secondary. One transformer has an ohmic drop of 0.5% at full-load and an inductive drop of 8% at full-load current. The other has an ohmic drop of 0.75% and inductive drop of 2%. Show how will they share a load of 180 kW at 0.9 power factor. **[8]**

OR

P.T.O.

Q4) a) With the neat sketch and phasor diagram explain the V-V connection of the transformer. **[7]**

b) State the necessity of parallel operation of the transformer. State any four necessary conditions for satisfactory parallel operation of the transformer. **[8]**