Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

Roll No .....

EE/EX-4002 (CBGS)

B.E. IV Semester

Examination, November 2019

Choice Based Grading System (CBGS)

Electrical Machine - I

Time : Three Hours *Maximum Marks : 70*

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) Describe the principle and working of a single phase transformer and draw the no load phasor diagram of an ideal transformer. 7
   b) Describe open circuit and short circuit test on a single phase transformer. 7

2. a) A 11kV/ 220V, 150 kVA, 1-phase, 50 Hz transformer has core loss of 1.4kW and full load copper loss of 1.6kW. Determine maximum efficiency at unity power factor. 7
   b) Describe Sumpner's test on transformer with neat diagram. 7

3. a) Describe the possible ways of connection of 3-phase transformer with relevant relations amongst Voltage and Current on both LV and HV side. 7
   b) With the help of neat diagram, Explain Scott connection in detail. 7

4. a) Explain the operation of polyphase squirrel induction motor. 7
   b) Derive the equation for the torque developed by an induction motor. Draw a typical torque slip characteristics curve. 7

5. a) The power input to a 500V, 50Hz, 6pole 3ϕ squirrel cage induction motor running at 975 rpm is 40kW. The stator losses are 1kW and friction and windage losses are 2KW. Calculate: 7
   i) Slip
   ii) Rotor copper loss
   iii) Efficiency
   b) Compare induction motor with Transformer. 7

6. a) A three phase, 6pole 50Hz induction motor has an slip of 1% at no load and 3% at full load. Find: 7
   i) Synchronous speed
   ii) No load speed
   iii) Full load speed
   iv) Frequency of Rotor current at full load.
   b) Discuss why starter is needed for a 3ϕ Induction motor? Explain any one method for starting of a 3ϕ induction motor. 7

7. a) Why Single phase induction motor is not self starting? List the starting methods single phase induction motor. 7
   b) Give the construction and working principle of single phase a.c. Series motors. 7

8. Write short notes (Any two) 2×7=14
   a) Cogging and Crawling
   b) Servo motors
   c) LIM
   d) Conservator and Breather

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