

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 3 ϕ 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 3 ϕ Induction motor? Explain any one method for starting of a 3 ϕ 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 \times 7=14
 a) Cogging and Crawling
 b) Servo motors
 c) LIM
 d) Conservator and Breather
