

R09**Code: 9A02407**

B.Tech II Year II Semester (R09) Supplementary Examinations May/June 2016

ELECTRICAL MACHINES – II
(Electrical & Electronics Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) With neat phasor diagram, explain the operation of transformer with resistive load.
(b) A single phase transformer with a primary (HV) voltage of 1600 V with a ratio of 8:1. The transformer supplies a load of 20 kW at a pf of 0.8 lagging and takes a no-load current of 2 A at pf of 0.2, estimate the current taken by the primary.
- 2 (a) Obtain the condition for zero voltage regulation & maximum voltage regulation of transformer.
(b) The efficiency of a 250 kVA single phase transformer is 96% at full load, 0.8 pf lagging & 97.2% at half full load, unity pf. Determine the efficiency of transformer at $3/4^{\text{th}}$ load with 0.8 lagging pf.
- 3 (a) Derive the equation for saving in copper in using auto transformer when compared to two winding transformer.
(b) Obtain the equivalent circuit of an auto transformer.
- 4 Two identical transformers each of rating 5 kVA, 200V/100V, 50 Hz transformers are connected in open delta. Calculate the kVA rating of the open delta bank when HV side is used as primary.
- 5 How is the torque produced in the rotor of the three-phase induction motor? Explain with neat diagram.
- 6 (a) Derive the torque equation for 3- Φ induction motor. Obtain the relationship between maximum torque and starting torque.
(b) Explain torque slip characteristics of an induction motor.
- 7 (a) Explain the no load and blocked rotor tests on 3-phase induction motor.
(b) Explain how the equivalent circuit parameters 3-phase induction motors are obtained from the tests.
- 8 (a) Explain about the speed control of induction motor by Tandem operation and derive the formula of speed.
(b) A 2-pole and 6-pole induction motor are connected cumulative cascade, the frequency in the secondary circuit of the 6-pole motor is observed to be 1 Hz. Determine the slip in each machine and the combined speed of the set. Take supply frequency as 50 Hz.
