

R09

Code: 9A02407

B.Tech II Year II Semester (R09) Supplementary Examinations December/January 2015/2016

ELECTRICAL MACHINES - II

(Electrical & Electronics Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

- 1 (a) What are the various losses taking place in transformer? How these losses can be minimized?
(b) A 2.4 kV/115 V transformer has sinusoidal flux density expressed by $0.113 \sin 188.5t$. Determine the primary & secondary turns.
- 2 (a) Explain the importance of equivalent circuit of transformer in its applications.
(b) The equivalent circuit parameters of 200/2000 V transformer as follows: $R_{eq} = 0.16$, $X_{eq} = 0.7$, $X_o = 231$, $R_o = 400$ (all referred to LV side) If load impedance is $600 + j500$; find secondary load voltage & primary current.
- 3 (a) Explain the test procedure to separate iron losses of a transformer with neat circuit diagram, tabulation and model graph.
(b) Explain equivalent circuit of an auto-transformer and also explain how it differs from two winding transformer.
- 4 A 3-phase, 500 kVA, 6000 V/400 V, 50 Hz, delta-star connected transformer is delivering 300 kW, at 0.8 pf lagging to a balanced 3-phase load connected to the LV side with HV side supplied from 6000 V, 3-phase supply. Calculate the line and winding currents in both the sides. Assume the transformer to be ideal.
- 5 (a) Explain the importance of the "Slip" in three phase induction motor.
(b) A star connected three phase induction motor draws 4A when connected across a 400 V, 50 Hz supply. If the power factor is 0.8 and the efficiency of the motor is 90%, how much BHP will the motor develop?
- 6 (a) Draw and explain the phasor diagram of 3-phase induction motor.
(b) Discuss the phenomenon of crawling and cogging in an induction motor.
- 7 (a) Explain why induction motors will take large amount of current at the time of starting.
(b) A 3-phase squirrel cage induction motor, with an applied voltage of 40%, gives a blocked rotor current of 250% and internal starting torque of 30% of their corresponding rated values. If an autotransformer limits the starting line current to 150% of the motor full load current, compute the % starting torque.
- 8 (a) Explain briefly how the speed control of induction motor is achieved from rotor side.
(b) A 4-pole induction motor 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.
