

Question Bank (I-Scheme)

Course: Industrial AC Machines

Unit Test: I

Course code: 22523 (IAM)

Semester: 5I

Program Code: EE

Chapter 1: (Three Phase Induction Motors)

2 Marks

1. Define slip and synchronous speed of 3 phase induction motor.
2. State working principle of three phase induction motor.
3. Give any two advantages of slip ring rotor over squirrel cage rotor
4. A three phase, 50 Hz induction motor runs at 960rpm on full load. Find number of poles and percentage slip. ($N_s = 1000$ rpm)
5. Draw the torque slip characteristics of three phase induction motor.

4 Marks

1. Draw the power flow diagram of three phase induction motor.
2. A 3 phase, 50 Hz 8 pole induction motor has full load slip of 2%. The rotor resistance and standstill rotor reactance per phase are 0.001 ohm and 0.005 ohm respectively. Find the ratio of maximum to full load torque and the speed at which the maximum torque occurs.
3. The power input to a six pole, 3 phase, 50 Hz induction motor is 42 kW, the speed being 970 rpm. The stator losses are 1.2 kW and friction and windage losses are 1.8 kW. Find i) slip, ii) Rotor Output iii) Rotor copper loss and iv) Efficiency.
4. Compare slip ring induction motor with squirrel cage induction motor on any four parameters.
5. "Three phase induction motor is known as generalized transformer". Justify.
6. Draw neat diagram of star-delta starter for three phase induction motor.
7. Derive the condition for maximum torque under running conditions for a three phase induction motor.
8. Explain working of auto transformer starter for a 3 phase induction motor with neat diagram.
9. A 12 pole, 50Hz, 3 phase induction motor has rotor resistance of 0.15Ω and stand still reactance of 0.25Ω per phase. On full load, it is running at a speed of 480 rpm. The rotor induced emf per phase at standstill is observed to be 32 V. Calculate: (1) Starting torque (2) Full load torque (3) Maximum torque (4) Speed at maximum torque

10. List the different method of speed control of 3 phase induction motor and explain any one method in detail.
11. Explain the activities carried out during Annual maintenance of 3 ph. Induction motor.

Chapter 2: (Single Phase Induction Motors)

2 Marks

1. State any two application of repulsion motor.
2. State the function of centrifugal switch in single phase induction motor.
3. Give any two application for i) Universal motor and ii) Hysteresis motor.

4 Marks

1. Explain with necessary diagram, working of capacitor start capacitor run induction motor.
2. Draw and explain torque speed characteristics of universal motor and suggest the applications of the same.
3. Describe with neat sketch working of repulsion motor.
4. Describe with neat sketch the working of shaded pole induction motor.
5. Why single phase induction motor is not self-starting? Justify with the help of double field revolving theory.
6. Explain working of resistance split phase single phase induction motor with vector diagram.
7. Describe with neat sketch working of hysteresis motor.
8. Explain the activities carried out during weekly maintenance of 1 ph. Induction motor.