Lecture-42
Tutorial

Lecture delivered by:

Objectives

At the end of this lecture, student will be able to:

- Solve the problems on 3 – phase Induction Motors

Problem 1:

An 8 pole 3 ϕ, 50 Hz induction motor has rotor resistance of 0.025 ohm/phase and rotor standstill reactance of 0.1ohm/phase. At what speed is the torque maximum? What proportion of maximum torque is the starting torque?

Problem 2:

A 6 pole 3ϕ induction motor develops 30hp including 2 hp mechanical losses at a speed of 950 r.p.m. on 550V, 50Hz Mains.

Find:

1) Slip

2) Rotor Cu. loss

Problem 3:

A 208-V, 10hp, four pole, 60 Hz, Y-connected induction motor has a full-load slip of 5 percent

1. What is the synchronous speed of this motor?
2. What is the rotor speed of this motor at rated load?
3. What is the rotor frequency of this motor at rated load?
4. What is the shaft torque of this motor at rated load?

Problem 4:

A 0.5 hp, 6-pole induction motor is excited by a 3-phase, 60 Hz source. If the full-load is 1140 r/min, calculate the slip.

Problem 5:

A 120 pole 3 – phase star connected induction motor has a slip ring rotor of resistance 0.016 ohm and stand still reactance 0.265 ohm per phase. Full load torque is obtained at a speed of 247 r.p.m. calculate

(i) ratio of maximum to full load toque.

(ii) Speed at maximum torque.