Lecture-41
Tutorial

Lecture delivered by:

Objectives

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

- Solve the problems on the 3 – phase Induction Motors

Problem 1:

A 3 – ϕ, 4 pole, 50 Hz induction motor runs at 1460 r.p.m. find its %age slip.

Problem 2:

A 12 pole 3 - ϕ alternator driver at speed of 500 r.p.m. supplies power to an 8 pole 3 ϕ induction motor. If the slip of motor is 0.03p.u, calculate the speed.

Problem 3:

A 3-ϕ 4 pole induction motor is supplied from 3ϕ 50Hz ac supply.

Find

(1) synchronous speed

(2) rotor speed when slip is 4%

(3) the rotor frequency when runs at 600r.p.m.

Problem 4:

A 12 pole 3-ϕ alternator is coupled to an engine running at 500r.p.m. If supplied a 3ϕ induction motor having full speed of 1400 r.p.m. Find the %age slip, frequency of rotor current and no of poles of rotor.

Problem 5:

The rotor of 3 - ϕ induction motor rotates at 900r.p.m. when states is connected to 3 - ϕ supply .find the rotor frequency.

Problem 6:

A 3 - ϕ 50Hz induction motor has a full load speed of 960 r.p.m

(a) find slip

(b) No of poles

(c) Frequency of rotor induced e.m.f

(d) Speed of rotor field w.r.t. rotor structure

(e) Speed of rotor field w.r.t. Stator structure

Problem 7:

A 50 Hz, 8 pole induction motor has full load slip of 4%. The rotor resistance and stand still reactance are 0.01 ohm and 0.1 ohm per phase respectively. Find:

i) The speed at which maximum torque occurs

ii) The ratio of maximum torque to full load torque

Problem 8:

A 3-ϕ 6 pole, 60Hz induction motor has a slip of 3% at full load. Find the synchronous speed, full load speed and frequency of rotor current at full load.