

# Lecture-44

## **Tutorial**

Lecture delivered by:



# Objectives

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

- Solve the problems on Synchronous Generators



### Problem 1:

A 8 pole, alternator runs at 750 rpm and supplies power to a 6-pole induction motor which has a full-load slip of 3 %. Find the full load slip of the motor and the frequency of the rotor e.m.f.

### Problem 2:

Develop a table showing the speed of magnetic field rotation in ac machines of 2, 4, 6, 8, 10, 12, and 14 poles operating at frequencies of 50, 60, and 400 Hz.



### Problem 3:

A motor generator set used for providing variable frequency ac supply consists of a 3- $\phi$  synchronous and 24 pole 3  $\phi$  synchronous generator. The motor generator set is fed from 25hz, 3 -  $\phi$  ac supply. A 6 pole 3  $\phi$  induction motor is electrically connected to the terminals of the synchronous generator and runs at a slip of 5%. Find

- i) The frequency of generated voltage of synchronous generator
- ii) the speed at which induction motor is running



### Problem 4:

In an alternator with 8 poles is to generate power at 50 Hz frequency, what should be its synchronous speed.

### Problem 5:

A 6 pole alternator is driven at a speed of 500 rpm. What is the frequency of its generated e.m.f ?

### Problem 6:

A 12 pole, 500 rpm, star connected alternator has 60 slots, with 20 conductors per slot. The flux per pole is 0.02 wb and is distributed sinusoidally. The winding factor is 0.93. calculate

- a) Frequency
- b) Phase e.m.f
- c) Line e.m.f

