

Department of Electronics & Communication Engineering

Faculty of Engineering, Integral University, Lucknow

Home Assignment-4

Basic Electrical Engineering (IEN-101)

Faculty : Dr. Syed Hasan Saeed

Section : EC-1

Problems : 05

1. Explain the construction of three phase induction motor.
2. A three phase induction motor is supplying a mechanical load at a full load speed of 1170 rpm. The voltage supply to the motor is from a 10 pole synchronous generator, which is operating at a synchronous speed of 720rpm. Determine the number of poles and per unit slip of the induction motor.
[6, 0.025]
3. Explain the Torque-Slip characteristic of induction motor.
4. A six pole, wave-connected armature has 200 conductors and runs at 1500 rpm. The emf generated in the open circuit is 600V. Find the useful flux per pole.
5. A six pole dc generator has an armature of diameter 20 cm and length 25 cm. The armature is wave connected with 250 conductors and it runs at 800 rpm. If the average flux density is 0.09 Wb/sq. m, calculate (i) the torque developed and (ii) the power output by the generator when a resistor of 5 Ω is connected across its brushes.
[48.34 Nm, 4050W]
6. Derive the expressions for the (i) generated emf and (ii) electromagnetic torque of dc machine. Explain what happens when the direction of rotation is reversed in each case.
7. Classify generators according to their connections.
8. Describe with the help of a connection diagram, the operation of a split-phase induction motor and also draw the torque-slip characteristics.
9. Describe the operation of a two-capacitor motor.
10. Draw the connection diagram of a shaded-pole induction motor and explain how a torque is produced.