

Induction Motor Examples

1. A three-phase induction motor has four poles and is supplied from a 50 Hz system. Calculate:
 - (i) The synchronous speed.
 - (ii) The speed of the rotor when the slip is 6%.
 - (iii) The rotor frequency when the speed of the rotor is 580 r/min.
 - (iv)
2. A Locked Load test was conducted on a 3-phase star connected induction motor. The test resulted in a per phase power of 99 W, with a phase current of 3A at a phase voltage of 220V. The stator resistance, R_s , is 0.6 Ω . Determine:
 - (i) The rotor resistance (R_r)
 - (ii) The equivalent reactance (X_{eq})
 - (iii) The locked-load power factor
3. The 415 V, three-phase, 50 Hz, star-connected induction motor shown in Fig. 38.10 has the following per-phase equivalent circuit parameters: $R_s = 1 \Omega$, $X_{eq} = 5 \Omega$, $X_m = 60 \Omega$, $R_c = 240 \Omega$, $R_r = 1 \Omega$. Using the per-phase equivalent circuit of the machine, calculate the current drawn from the supply. If the friction and windage loss in the machine is 200 W calculate the efficiency of the motor for a slip of 5%.