

Sheet # 6

3-Phase Induction Motor (Power Calculations)

- 1- A 20hp, 3-phase, 500 V, 50 Hz, induction motor with 6 poles runs at 950 rpm with power factor of 0.86 lagging. The rotational losses are 1 hp. If the total stator losses are 1500 W.
Calculate: (a) Motor slip (b) Rotor copper losses
 (c) Motor input current (d) Efficiency

- 2- The input power to a 6 poles, 3-phase, 50 Hz, induction motor is 42 kW, the speed is 970 rpm. The stator losses are 1.2 kW and the friction and windage losses are 1.8 kW. Find :
 (a) Rotor Copper Losses
 (b) Efficiency of the motor

- 3- A 6 poles, 50 Hz, 3 phase induction motor runs at 960 rpm when the torque on the shaft is 200 N.m. If the stator losses are 1500 W and friction and windage losses are 500 W, find:
 (a) Rotor Copper Losses
 (b) Efficiency of the motor

- 4- The power input to the rotor of a 440 V, 50 Hz, 6 poles, 3 phase induction motor is 100 kW. The motor speed is 960 rpm. Calculate:
 (a) The slip
 (b) The mechanical developed power
 (c) Rotor copper losses

- 5- A 3 phase, 500 V, 50 Hz induction motor with 6 poles develops 20 hp at 950 rpm with a power factor of 0.866 lagging. The mechanical losses total 1 hp. Calculate at rated load:
 (a) The slip
 (b) Rotor copper losses
 (c) Input power if the stator losses in total are 1500 W
 (d) Line current

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