A 208-V four-pole 60-Hz Y-connected wound-rotor induction motor is rated at 30 hp. Its equivalent circuit components are

$R_1 = 0.100\ \Omega$ $R_2 = 0.070\ \Omega$ $X_M = 10.0\ \Omega$

$X_1 = 0.210\ \Omega$ $X_2 = 0.210\ \Omega$

$P_{\text{mech}} = 500\ \text{W}$ $P_{\text{misc}} \approx 0$ $P_{\text{core}} = 400\ \text{W}$

For a slip of 0.05, find

(a) The line current I_L

(b) The stator copper losses P_{SCL}

(c) The air-gap power P_{AG}

(d) The power converted from electrical to mechanical form P_{conv}

(e) The induced torque τ_{ind}

(f) The load torque τ_{load}

(g) The overall machine efficiency

(h) The motor speed in revolutions per minute and radians per second