The following constants apply to a 2200 V 50 hp, three-phase 60 Hz wye-connected, 6 pole squirrel-cage induction motor.

\[ R_1 = 3.5 \, \Omega/\text{phase} \quad X_1 = X_2 = 7.2 \, \Omega/\text{phase} \]
\[ R_2 = 2.4 \, \Omega/\text{phase} \quad R_{fe} = 4170 \, \Omega/\text{phase} \]
\[ R_{\text{m}} = 328 \, \Omega/\text{phase} \]

Assume that the value of \( R_{fe} \) includes the friction, windage and stray losses. Also assume that the motor core losses are negligible. Calculate for a slip of 0.019: a.) the rotor developed torque; b.) the motor efficiency c.) the motor power factor.