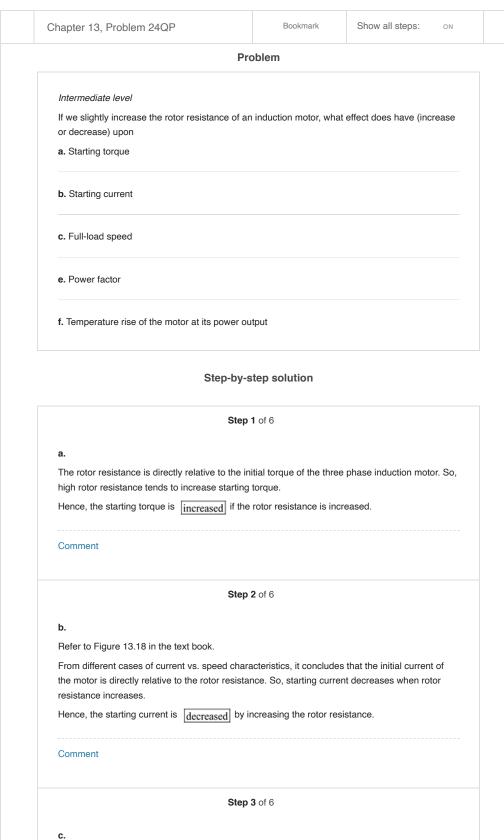
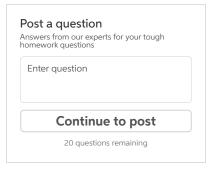
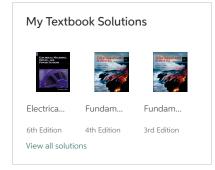
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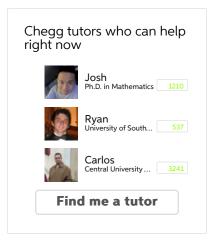
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Increasing of rotor resistance reduces the rotor current and it tends to reduce the torque. So, it is essential to decrease the motor speed (full-load speed) to develop an equivalent torque which was available at earlier.
Hence, the full-load speed of the motor is slightly decreased by increasing the rotor resistance.
Comment
Step 4 of 6
d.
Write an expression to find I^2R losses in the rotor.
$P_{\rm jr} = I^2 R$
Here,
/ is the current [A], and
R is the rotor resistance $\left[\Omega\right]$.
This I^2R loss is directly relative to the rotor resistance. So, losses increases by increasing the rotor resistance. The equation of efficiency of the motor is mentioned as follows:
$\eta = \frac{\text{output power}}{\text{input power}}$
_ output power
$= \frac{1}{\text{output power} + \text{losses}}$
So, increasing of losses tends to decrease the efficiency of the motor.
Hence, the efficiency is decreased by increasing the rotor resistance.
Comment
Step 5 of 6
Step 5 of 6 e.
·
е.
e. Consider the expression of power factor. pf =real power
e. Consider the expression of power factor. $pf = \frac{\text{real power}}{\text{apparent power}}$ From this expression, power factor is directly relative to the real power. Increasing of rotor resistance increases the real power of the motor. So, this increasing of real power increases the
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Comment

Was this solution helpful? 2 0

Recommended solutions for you in Chapter 13

Chapter 13, Problem 16QP

Intermediate levelA 3-phase, 6-pole induction motor is connected to a 60 Hz supply. The voltage induced in the rotor bars is 4 V when the rotor is locked. If the motor turns in the same direction as the flux, calculate the approximate voltage...

See solution

Chapter 13, Problem 14QP

Practical levelHow can we change the direction of rotation of a 3-phase induction motor?

See solution

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