34. (a) Eq. 10-34 gives $\alpha = \tau/I$ and Eq. 10-12 leads to $\omega = \alpha t = \tau t/I$. Therefore, the angular momentum at $t = 0.033$ s is

$$I\omega = \tau t = (16\,\text{N}\cdot\text{m})(0.033\,\text{s}) = 0.53\,\text{kg}\cdot\text{m}^2/\text{s}$$

where this is essentially a derivation of the angular version of the impulse-momentum theorem.

(b) We find

$$\omega = \frac{\tau t}{I} = \frac{(16)(0.033)}{1.2\times10^{-3}} = 440\,\text{rad}$$

which we convert as follows: $\omega = (440)(60/2\pi) \approx 4.2\times10^3$ rev/min.