

38. (a) The rotational inertia of the three blades (each of mass  $m$  and length  $L$ ) is

$$I = 3 \left( \frac{1}{3} m L^2 \right) = m L^2 = (240 \text{ kg})(5.2 \text{ m})^2 = 6.49 \times 10^3 \text{ kg} \cdot \text{m}^2 .$$

- (b) The rotational kinetic energy is

$$\begin{aligned} K &= \frac{1}{2} I \omega^2 \\ &= \frac{1}{2} (6.49 \times 10^3 \text{ kg} \cdot \text{m}^2) \left( (350 \text{ rev/min}) \left( \frac{2\pi \text{ rad/rev}}{60 \text{ s/min}} \right) \right)^2 \\ &= 4.36 \times 10^6 \text{ J} = 4.36 \text{ MJ} . \end{aligned}$$