

**Answer on Question #62667-Physics-Other**

A compact disc has a 6.00-cm radius and spins at 485 rpm (revolutions per minute). What is the magnitude of the centripetal force on a 3.81- $\mu\text{g}$  speck of dust that is at the edge of the spinning compact disc?

**Solution**

$$F = m\omega^2 r.$$

$$r = 0.06 \text{ m}.$$

$$m = 3.81 \cdot 10^{-6} \text{ kg}.$$

$$\omega = 485 \left( \frac{2\pi}{60} \right) \frac{\text{rad}}{\text{s}}.$$

$$F = (3.81 \cdot 10^{-6}) \left( 485 \left( \frac{2\pi}{60} \right) \right)^2 (0.06) = 5.90 \cdot 10^{-4} \text{ N}.$$

**Answer:**  $5.90 \cdot 10^{-4} \text{ N}$ .

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