29. Since the belt does not slip, a point on the rim of wheel C has the same tangential acceleration as a point on the rim of wheel A. This means that $\alpha_A r_A = \alpha_C r_C$, where α_A is the angular acceleration of wheel A and α_C is the angular acceleration of wheel C. Thus,

$$\alpha_C = \left(\frac{r_A}{r_C}\right) \alpha_A = \left(\frac{10\,\text{cm}}{25\,\text{cm}}\right) (1.6\,\text{rad/s}^2) = 0.64\ \text{rad/s}^2\ .$$

Since the angular speed of wheel C is given by $\omega_C = \alpha_C t$, the time for it to reach an angular speed of $\omega = 100\,\text{rev/min} = 10.5\,\text{rad/s}$ starting from rest is

$$t = \frac{\omega_C}{\alpha_C} = \frac{10.5\,\text{rad/s}}{0.64\,\text{rad/s}^2} = 16\ \text{s}\ .$$