

$$F_1 = m_1 a_1 = m_1 r_1 \alpha \quad \text{--- ①}$$

$$\tau_1 = r_1 \cdot F_1 \cdot \sin 90^\circ = r_1 \cdot (m_1 r_1 \cdot \alpha)$$

$$\tau_1 = m_1 r_1^2 \alpha \quad \text{--- ②}$$

$$\tau_2 = m_2 r_2^2 \alpha, \dots \tau_n = m_n r_n^2 \alpha$$

$$\tau = \tau_1 + \tau_2 + \dots + \tau_n$$

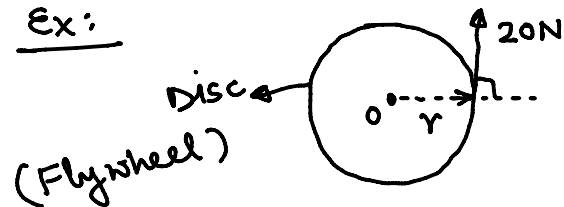
$$\tau = m_1 r_1^2 \alpha + m_2 r_2^2 \alpha + \dots + m_n r_n^2 \alpha$$

$$\tau = (m_1 r_1^2 + m_2 r_2^2 + \dots + m_n r_n^2) \alpha$$

$$\boxed{\tau = I \alpha} \quad \text{--- ③} \rightarrow \text{Rotational Motion}$$

$$F = ma \rightarrow \text{Trans. motion}$$

Ex:



$$R = 50 \text{ cm}, \quad M = 20 \text{ kg}$$

$$\alpha = ?$$