

Module 4 - MCQ Single Choice

①

$$1.) J = \int F \cdot dt = \text{Area under } F-t$$

$$= (2 \times 200 + \frac{1}{2} \times 2 \times 600 + \frac{1}{2} \times 10^5 \times 800) \times 10^{-3} \text{ Ns}$$

$$= 5000 \times 10^{-3}$$

$$= 5 \text{ Nsec (d)}$$

$$2.) e = \frac{V_{sep}}{V_{app}} ; V_{sep} = e V_{app} \leq V_{app}$$

$$(3.) \vec{V}_{cm} = \frac{m_1 \vec{v}_1 + m_2 \vec{v}_2}{m_1 + m_2}$$

$$\vec{v}_{1cm} = \vec{v}_1 - \vec{V}_{cm} = \frac{m_2 (\vec{v}_1 - \vec{v}_2)}{m_1 + m_2}$$

$$\vec{v}_{2cm} = \frac{m_1 (\vec{v}_2 - \vec{v}_1)}{m_1 + m_2}$$

So, they move in opposite direction wrt COM

(4) Theoretical

$$(5) mv = (M+m)v'$$

$$v' = \frac{mv}{M+m}$$

