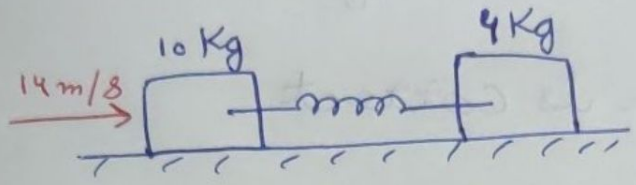
Two blocks of masses 10 kg and 4 kg are connected by a spring of negligible mass and placed on a frictionless horizontal surface. An impulse gives a velocity of 14 m/s to the heavier block in the direction of the lighter block. The velocity of the centre of mass is **(2002, S)**

(a) 30 m/s
(b) 20 m/s
(c) 10 m/s
(d) 5 m/s

Solution



Since, after applying the impulse no external force acts in direction of motion. Hence V_{com} will remain constant and can be calculated using

$$V_{com} = \frac{m_1 V_1 + m_2 V_2}{m_1 + m_2} \qquad \begin{pmatrix} m_1 = 10 \\ m_2 = 4 \end{pmatrix}$$

$$= \frac{10 \times 14 + 4 \times 0}{10 + 4}$$

$$= 10 \text{ m/s}$$

C option