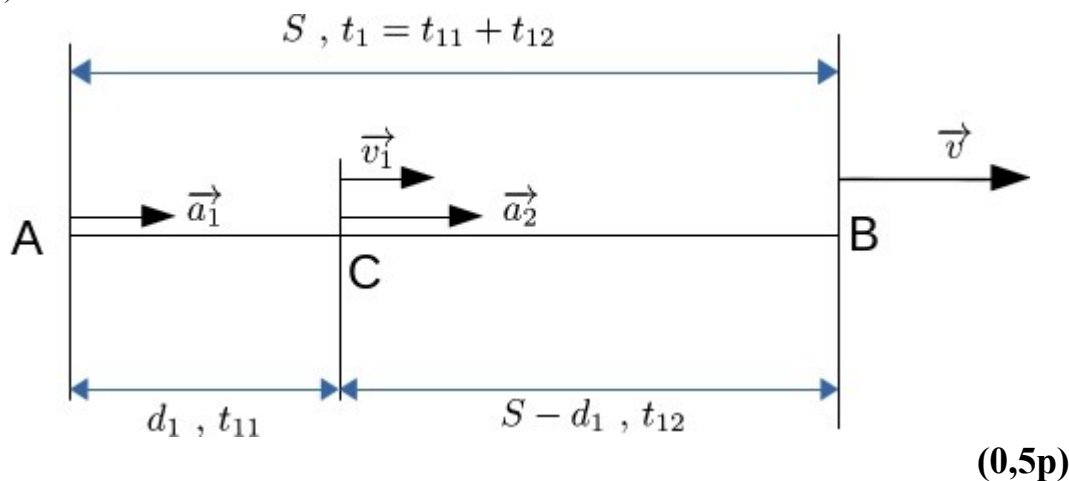


Subiectul I

a)

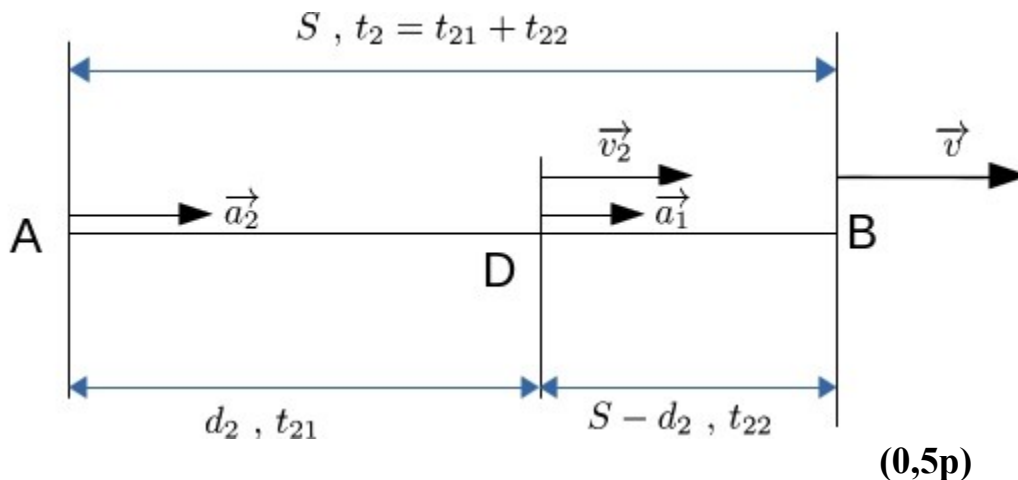


$$t_1 = t_{11} + t_{12}$$

$$d_1 = \frac{a_1 t_{11}^2}{2}; v_1 = a_1 t_{11} \rightarrow t_{11} = \frac{v_1}{a_1} \rightarrow (c) d_1 = \frac{v_1^2}{2a_1} = 72 \text{ m}; S - d_1 = v_1 t_{12} + \frac{a_2 t_{12}^2}{2};$$

$$v = v_1 + a_2 t_{12} \rightarrow a_2 t_{12} = v - v_1 \rightarrow t_{12} = \frac{v - v_1}{a_2} \rightarrow S - \frac{v_1^2}{2a_1} = \frac{v_1^2}{2} \left(\frac{1}{a_1} - \frac{1}{a_2} \right) \rightarrow$$

$$v_1 = 12 \frac{\text{m}}{\text{s}} \rightarrow t_{11} = 12 \text{ s}; t_{12} = 4 \text{ s}; t_1 = 16 \text{ s.} \quad (4\text{p})$$

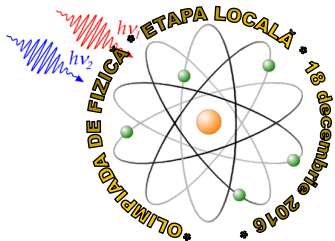


a) $t_2 = t_{21} + t_{22}$

$$d_2 = \frac{a_2 t_{21}^2}{2}; v_2 = a_2 t_{21} \rightarrow t_{21} = \frac{v_2}{a_2} \rightarrow (c) d_2 = \frac{v_2^2}{2a_2} = 64 \text{ m}; S - d_2 = v_2 t_{22} + \frac{a_1 t_{22}^2}{2};$$

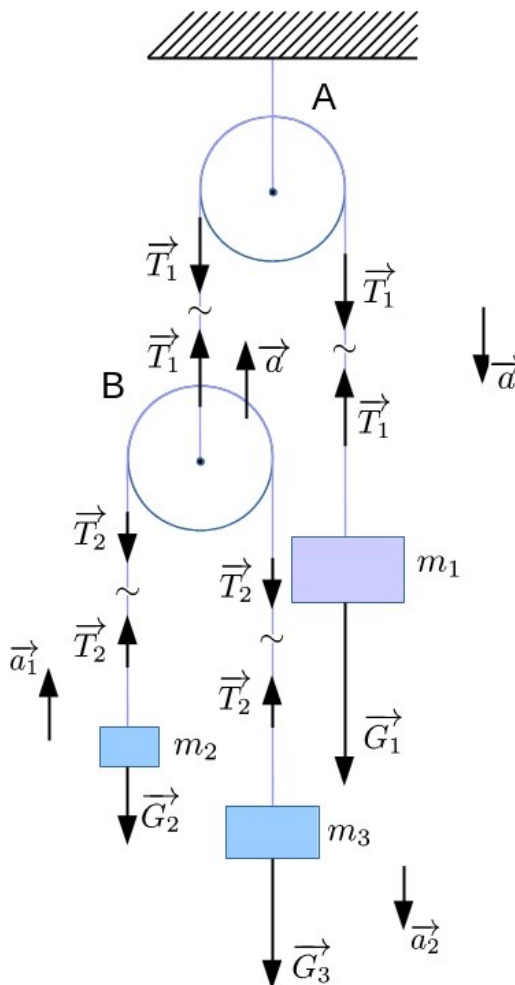
$$v = v_2 + a_1 t_{22} \rightarrow a_1 t_{22} = v - v_2 \rightarrow t_{22} = \frac{v - v_2}{a_1} \rightarrow S - \frac{v_2^2}{2a_2} = \frac{v_2^2}{2} \left(\frac{1}{a_2} - \frac{1}{a_1} \right) \rightarrow$$

$$v_2 = 16 \frac{\text{m}}{\text{s}} \rightarrow t_{21} = 8 \text{ s}; t_{22} = 4 \text{ s}; t_2 = 12 \text{ s.} \quad (4\text{p})$$



Subiectul II

Reprezentarea forțelor (2p)



Pt. m_1 : $m_1 g - T_1 = m_1 a$ (1p)

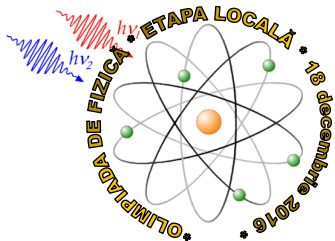
Pt. B: $T_1 = 2 T_2$ (1p)

Pt. m_2 : $T_2 - m_2 g = m_2 (a + a_2)$ (1p)

Pt. m_3 : $T_2 - m_3 g = m_3 (a - a_2)$ (1p)

$$a = g \frac{m_1(m_2 + m_3) - 4m_2 m_3}{m_1(m_2 + m_3) + 4m_2 m_3} \quad (2p)$$

$$a = 0,58 \frac{m}{s^2} \quad (1p)$$



CLASA a IX - a * Rezolvări și bareme *

Subiectul III

Rezolvare

pentru: $t \in (0; 1)s$;

$$F = ma_1; a_1 = \frac{F}{m} = 5 \frac{m}{s^2}; \quad (0,50p)$$

$$v_1 = a_1 \Delta t = 5 \frac{m}{s}; \quad \Delta t = 1s \quad (0,25 p)$$

$$x_1 = \frac{a_1}{2} \Delta t^2 = 2,5 m \quad (0,25p)$$

pentru: $t \in (1; 2)s$; $F = ma_2$;

$$a_2 = \frac{F}{m} = -5 \frac{m}{s^2}; \quad (0,50p)$$

$$v_2 = v_1 + a_2 \Delta t = 0 \frac{m}{s}; \quad (0,25 p)$$

$$x_2 = v_1 \Delta t + \frac{a_2}{2} \Delta t^2 = 2,5 m \quad (0,25p)$$

pentru: $t \in (2; 3)s$; $F = ma_3$;

$$a_3 = \frac{F}{m} = -5 \frac{m}{s^2}; \quad (0,25p)$$

$$v_3 = v_2 + a_3 \Delta t = -5 \frac{m}{s}; \quad (0,25 p)$$

$$x_3 = v_2 \Delta t + \frac{a_3}{2} \Delta t^2 = -2,5 m \quad (0,25p)$$

pentru: $t \in (3; 4)s$; $F = ma_4$;

$$a_4 = \frac{F}{m} = 5 \frac{m}{s^2}; \quad (0,25p)$$

$$v_4 = v_3 + a_4 \Delta t = 0 \frac{m}{s}; \quad (0,25 p)$$

$$x_4 = v_3 \Delta t + \frac{a_4}{2} \Delta t^2 = -2,5 m \quad (0,25p)$$

pentru: $t \in (4; 5)s$; $F = ma_5$;

$$a_5 = 5 \frac{m}{s^2}; \quad (0,25p)$$

$$v_5 = v_4 + a_5 \Delta t = 5 \frac{m}{s}; \quad (0,25p)$$

$$x_5 = v_4 \Delta t + \frac{a_5}{2} \Delta t^2 = 2,5 m \quad (0,25p)$$

pentru: $t \in (5; 6)s$; $F = ma_6$;

$$a_6 = -5 \frac{m}{s^2} \quad (0,25p)$$

$$v_6 = v_5 + a_6 \Delta t = 0 \frac{m}{s} \quad (0,25p)$$

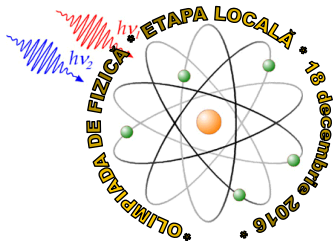
$$x_6 = v_5 \Delta t + \frac{a_6}{2} \Delta t^2 = 2,5 m \quad (0,25p)$$

pentru: $t \in (6; 7)s$; $F = ma_7$;

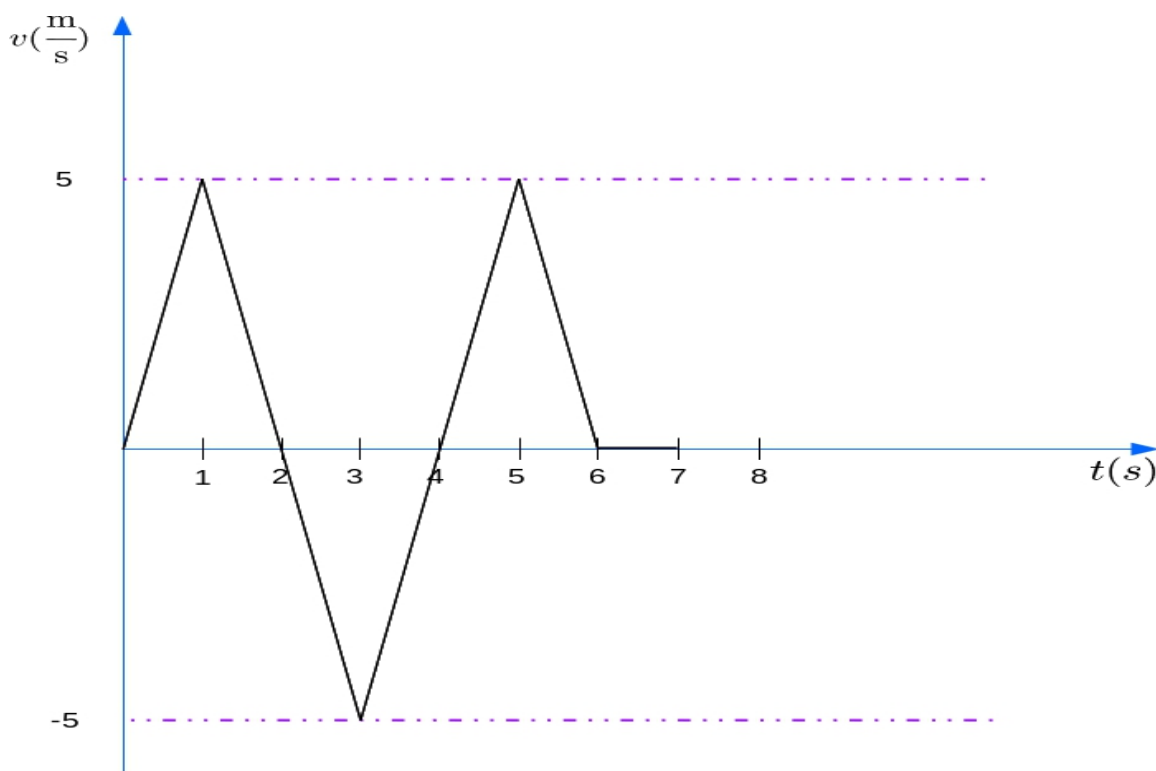
$$a_7 = 0 \frac{m}{s^2}; \quad (0,25p)$$

$$v_7 = v_6 = 0 \frac{m}{s} \quad (0,25p)$$

$$x_7 = v_6 \Delta t = 0 m \quad (0,25p)$$



Continuare rezolvare subiectul III



(2p)



(1,25p)