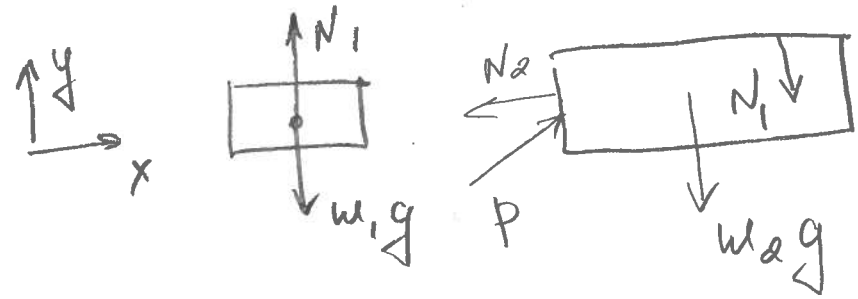
Answers Exam 2008

1. a) $x_{car} = -\frac{1}{2}\frac{v_1^2}{a_1} + D$

b) $a_2 = \frac{2}{T_c^2}\left(\frac{1}{2}a_1 T_c^2 - v_1 T_c + D\right)$

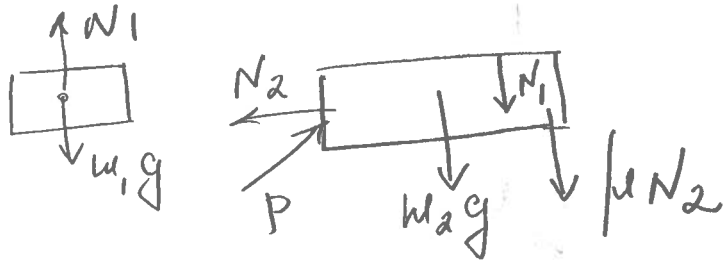
2. a)



b) $P = \frac{(m_1 + m_2)g}{\sin\theta}$

$\boxed{\text{force on } m_1 = 0}$ $\boxed{N_2 = P\cos\theta}$

c)



3. $F_1 = F_0 - 12 m \alpha t^2$

4. a) $t^* = \left(\frac{6D}{\beta}\right)^{\frac{1}{3}}$

$$\boxed{\begin{aligned} \frac{\beta t^{*3}}{6} &= D \\ \frac{\alpha t^{*3}}{6} &= -\frac{g t^{*2}}{2} + H \end{aligned}}$$

or $\boxed{-\frac{1}{2} g\left(\frac{6D}{\beta}\right)^{\frac{2}{3}} + H = \frac{1}{6}\alpha\frac{6D}{\beta}}$