

# Latvijas 34. Atklātās fizikas olimpiādes

## ATBILŽU LAPA

### Answer sheet

(2009. gads)

1. uzdevums

$$|F_{b1}| = \mu mg \frac{l-x}{2l}$$

$$|F_{b2}| = \mu mg \frac{l-x}{2l}$$

$$T_0 = 2\pi \sqrt{\frac{l}{\mu g}}$$

2. uzdevums

$$p = \frac{mg}{4\pi R^2}$$

$$m = \frac{4\pi R^2 p}{g} = 5,25 \cdot 10^{18} \text{ kg}$$

3. uzdevums

$$n = \frac{1}{\sin 45^\circ} = \sqrt{2} = 1.414$$

4. uzdevums

$$P = I(U - IR) = 36 \text{ kW}$$

5. uzdevums

$$N_v/N_u = \sqrt{1 + v^2/u^2}$$

6. uzdevums

a), b) vienlaicīgi / simultaneously

7. uzdevums

$$h = \frac{2u(v \cos \alpha - u) \operatorname{tg}^2 \alpha}{g}$$

8. uzdevums

$$V_1 = V_2 = \frac{1}{9}U = 0,5 \text{ V}$$

$$V_3 = \frac{2}{9}U = 1 \text{ V}$$

9. uzdevums

$$\frac{i}{2}p_0V_0 = \frac{i}{2}p_12V_0 + \frac{kx^2}{2}$$

$$p_1S = kx, \quad V_0 = Sx$$

$$p_1 = p_0 \frac{i}{2i+1}$$

$$\frac{T_1}{T_0} = \frac{p_12V_0}{p_0V_0} = \frac{2i}{2i+1}$$

$$i/2 \equiv C_V/R \Rightarrow \frac{T_1}{T_0} = \frac{4}{4 + R/C_V}$$