

OPĆINSKO/GRADSKO NATJECANJE IZ FIZIKE 2017/2018
Osnovne škole – rješenja

29.01.2018.

1.

$$P = UI \quad 1 \text{ bod}$$

$$P_{uloženo} = 480 \text{ W} \quad 2 \text{ boda}$$

$$W = mgh \quad 1 \text{ bod}$$

$$P_{korisno} = \frac{W}{t} \quad 1 \text{ bod}$$

$$\eta = \frac{P_{korisno}}{P_{uloženo}} \quad 1 \text{ bod}$$

$$0,6 P_{uloženo} t = mgh \quad 1 \text{ bod}$$

$$t = 30 \text{ s} \quad 1 \text{ bod}$$

$$h = 4,32 \text{ m} \quad 2 \text{ boda}$$

2.

$$p = \frac{F}{A} \quad 1 \text{ bod}$$

$$p_{tv} = 100 p_{atm} = 10\,000\,000 \text{ Pa} \quad 1 \text{ bod}$$

$$F_{tv} = F_{glava} \quad 2 \text{ boda}$$

$$F_{tv} = pA = 1 \text{ N} \quad 2 \text{ boda}$$

$$P_{glava} = 8\,333 \text{ Pa} \quad 2 \text{ boda}$$

3.

$$U = U_{60} + U_{AB} \quad 1 \text{ bod}$$

$$U_{60} = 25 \text{ V} \quad 1 \text{ bod}$$

$$U = IR \quad 1 \text{ bod}$$

$$I_{60} = \frac{U_{60}}{R_{60}} = 0,417 \text{ A} \quad 1 \text{ bod}$$

$$I_{48} = \frac{U_{AB}}{R_{48}} = 0,104 \text{ A} \quad 1 \text{ bod}$$

$$I_{60} = I_{48} + I_R \quad 2 \text{ boda}$$

$$I_R = 0,3125 \text{ A} \quad 1 \text{ bod}$$

$$R = \frac{U_{AB}}{I_R} = 16 \, \Omega \quad 1 \text{ bod}$$

4.

$$F_{tr} = F_{vučno} \quad 2 \text{ boda}$$

$$F_{tr} = \mu mg \quad 1 \text{ bod}$$

$$mg = 116,66 \text{ N} \quad 1 \text{ bod}$$

$$\Delta l = 0,03 \text{ m} \quad 1 \text{ bod}$$

$$F_{el} = k \Delta l \quad 1 \text{ bod}$$

$$F_g = F_{el} \quad 1 \text{ bod}$$

$$k = 3888,89 \text{ N/m} \quad 2 \text{ boda}$$

5.

$$a_u = a - 2 \text{ cm} = 60 \text{ cm} = 0,6 \text{ m} \quad ; \quad b_u = b - 2 \text{ cm} = 26 \text{ cm} = 0,26 \text{ m} \quad 1 \text{ bod}$$

$$c_u = c - 1 \text{ cm} = 32 \text{ cm} = 0,32 \text{ m} \quad 1 \text{ bod}$$

$$V_u = a_u b_u c_u = 49920 \text{ cm}^3 = 0,049920 \text{ m}^3 \quad 1 \text{ bod}$$

$$V = a b c = 57288 \text{ cm}^3 = 0,057288 \text{ m}^3 \quad 1 \text{ bod}$$

$$V_{stakla} = V - V_u \quad 1 \text{ bod}$$

$$V_{stakla} = 7368 \text{ cm}^3 = 0,007368 \text{ m}^3 \quad 1 \text{ bod}$$

$$V_{vode} = \frac{3}{4} V_u = 37440 \text{ cm}^3 = 0,03744 \text{ m}^3 \quad 1 \text{ bod}$$

$$m_{stakla} = \rho_{stakla} V_{stakla} = 18,42 \text{ kg} \quad 1 \text{ bod}$$

$$m_{vode} = \rho_{vode} V_{vode} = 37,44 \text{ kg} \quad 1 \text{ bod}$$

$$Q = m_{vode} c_{vode} \Delta T_{vode} + m_{stakla} c_{stakla} \Delta T_{stakla} \quad 2 \text{ boda}$$

$$Q = 1\,319\,875,2 \text{ J} \quad 1 \text{ bod}$$

$$P = Q/t \quad 1 \text{ bod}$$

$$t = 1466,528 \text{ s} \quad 24,4 \text{ minute} \quad 1 \text{ bod}$$