Državno natjecanje iz fizike, 19.-20. studeni 2020
Osnovna škola – rješenja i smjernice za bodovanje

1. $m = \rho V$ 1 bod

$V_{staklo} = 6{,}24 \cdot 10^{-5}\ m^3$ 1 bod

$V_{vode} = 3{,}76 \cdot 10^{-5}\ m^3$ 1 bod

$m_{vode2} = 37{,}6$ g 1 bod

$P = \frac{W}{t} = \frac{Q}{t}$ 1 bod

$P_1 = P_2$ 1 bod

$Q_1 = Q_2$ 1 bod

$(m_{voda1} c_{voda} + m_{čaša} c_{staklo})\ \Delta t_1 = (m_{voda2}\ c_{vode} + m_{staklo}\ c_{staklo} + m_{čaša} c_{staklo})\ \Delta t_2$ 2 boda

$c_{staklo} = 888{,}53$ J/kgK 1 bod

2. $U_{paralelno} = U_1 = U_2 = 12$ V 1 bod

$P = \frac{U^2}{R}$ 1 bod

$R_A = 6\ \Omega$ 1 bod

$R_B = 3{,}6\ \Omega$ 1 bod

$R_C = 2{,}62\ \Omega$ 1 bod

$P = I^2 R$ 1 bod

$I = \frac{U}{R_{serija}}$ 1 bod

$P_A = 5{,}79$ W 1 bod

$P_B = 3{,}47$ W 1 bod

$P_C = 2{,}53$ W 1 bod

Najjače svijetli žaruljica A 1 bod

$P_{ukupno} = 11{,}78$ W 1 bod

3. $k_1 = 0{,}5$ m 1 bod

$k_2 = 1{,}5$ m 1 bod

$F_1 k_1 + F_2 k_2 = F_3 k_3$ *ili* $F_1 k_1 + F_2 k_2 = 0$ 2 boda

$F_1 = 240$ N 1 bod

$F_1 = mg$ 1 bod

$m = 24$ kg 1 bod

$V = abc = 0{,}04\ m^3$ 1 bod

$\rho = \frac{m}{V}$ 1 bod

$\rho = 600\ kg/m^3$ 1 bod

4. $\bar{v} = \frac{s}{t}$	1 bod
$\bar{v}_1 = 17{,}2\ \mathrm{m/s}$	1 bod
$\bar{v}_2 = 8{,}8\ \mathrm{m/s}$	1 bod
$a = \frac{\Delta v}{\Delta t}$	1 bod
Δt = 3 s	2 boda
a = -2,8 m/s^2	2 boda
F=ma	1 bod
F = 0,1274 N	1 bod

5. $R = \rho \frac{l}{S}$	1 bod
*R*s = *R*+*R*+ *R* +...= *nR*	1 bod
$\frac{1}{R_p} = \frac{1}{R} + \frac{1}{R} + \frac{1}{R} + \cdots = \frac{n}{R}$	1 bod
$R_p = \frac{R}{n}$	1 bod
n = 8	1 bod
ℓ = 1,25 m	1 bod
S = r^2 $\pi = 1{,}256\ 10^{-7}$ m^2	1 bod
R = 0,169 Ω	1 bod