

2017-2018-O'quv yili uchun 7-sinf Fizika
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Bizning telegramdagi manzilimiz: @Imtihonuz2018

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1. Bilgan: $m = 3 \text{ kg}$, $a = 2 \frac{\text{m}}{\text{s}^2}$, $A = 96 \text{ J}$, $t = ?$

Yechilishi: $A = Fs = ma \cdot \frac{at^2}{2}$
 $2A = ma^2 t^2$
 $t = \sqrt{\frac{2A}{m} \cdot \frac{1}{a}} = \sqrt{\frac{2 \cdot 96 \text{ J}}{3 \text{ kg}} \cdot \frac{1}{2 \frac{\text{m}}{\text{s}^2}}} = 4 \text{ s}$ $\text{J! } t = 4 \text{ s}$

2. Bilgan: $m = 0,78 \text{ kg}$, $F = 7 \text{ N}$, $\rho_2 = 7800 \frac{\text{kg}}{\text{m}^3}$, $\rho_3 = 10^3 \frac{\text{kg}}{\text{m}^3}$, $\rho_1 = ?$

Yechilishi: $F = mg - F_A$, $F_A = mg - F = \rho_3 V g$
 $V = \frac{F - mg}{\rho_3 g}$
 $V = \frac{7,8 \text{ N} - 6,8 \text{ N}}{10^3 \frac{\text{kg}}{\text{m}^3} \cdot 10 \frac{\text{m}}{\text{s}^2}} = 10^{-4} \text{ m}^3$
 $F_1 = mg - F_A$, $F_A = mg - F_1$
 $\rho_1 V g = mg - F_1$, $\rho_1 = \frac{mg - F_1}{Vg} = \frac{(7,8 - 7) \text{ N}}{10^{-4} \text{ m}^3 \cdot 10 \frac{\text{m}}{\text{s}^2}} = 800 \frac{\text{kg}}{\text{m}^3}$
 $\text{J! } \rho = 800 \frac{\text{kg}}{\text{m}^3}$

3. Bilgan: $m_1 = 0,7 \text{ kg}$, $m_2 = 0,4 \text{ kg}$, $v_2 = 300 \text{ m/s}$, $v_1 = ?$

Yechilishi: $(m_1 - m_2) v_1 = m_2 v_2$
 $v_1 = \frac{m_2 v_2}{m_1 - m_2}$
 $v_1 = \frac{0,5 \cdot 0,7 \text{ m}}{0,3} = 0,7 \frac{\text{m}}{\text{s}}$ $\text{J! } v_1 = 0,7 \frac{\text{m}}{\text{s}}$

4. Bilgan: $g = 10 \frac{\text{m}}{\text{s}^2}$, $g_1 = 2,45 \frac{\text{m}}{\text{s}^2}$, $R = 6,4 \cdot 10^6 \text{ m}$, $h = ?$

Yechilishi: $g = G \frac{M}{R^2} \Rightarrow gR^2 = GM$
 $g_1 = G \frac{M}{(R+h)^2} = \frac{gR^2}{(R+h)^2}$
 $\frac{g_1}{g} = \left(\frac{R}{R+h}\right)^2$
 $\frac{R}{R+h} = \sqrt{\frac{g_1}{g}} = \sqrt{\frac{2,45}{10}} \approx 0,5$
 $R = 0,5R + h \cdot 0,5$
 $R - h = 6,4 \cdot 10^6 \text{ m}$
 $\text{J! } h = 6,4 \cdot 10^6 \text{ m}$

6. Bilgan: $t = 60 \text{ s}$, $v_0 = 40 \frac{\text{km}}{\text{soat}} = 11,1 \frac{\text{m}}{\text{s}}$, $v_2 = 7,8 \frac{\text{m}}{\text{s}}$, $a = ?$

Yechilishi: $a = \frac{v_2 - v_0}{t} = \frac{(7,8 - 11,1) \frac{\text{m}}{\text{s}}}{60 \text{ s}} = -0,055 \frac{\text{m}}{\text{s}^2}$
 $t = \frac{v_0}{|a|} = \frac{11,1 \frac{\text{m}}{\text{s}}}{0,055 \frac{\text{m}}{\text{s}^2}} = 200 \text{ s}$ $\text{J! } a = -0,055 \frac{\text{m}}{\text{s}^2}$
 $t = 200 \text{ s}$

7. Berilgan:
 $l_1 = 0,05 \text{ m}$
 $l_2 = 0,3 \text{ m}$
 $F_1 = 12 \text{ N}$
 $F_2 = ?$

Yechilishi:
 $M_1 = M_2 \Rightarrow F_1 l_1 = F_2 l_2$
 $F_2 = \frac{F_1 l_1}{l_2} = \frac{12 \text{ N} \cdot 0,05 \text{ m}}{0,3 \text{ m}} = 2 \text{ N}$
 J: $F = 2 \text{ N}$

8. Berilgan:
 $m = 1,2 \text{ kg}$
 $l = 0,8 \text{ m}$
 $h = 0,2 \text{ m}$
 $F = 5,4 \text{ N}$
 $\eta = ?$

Yechilishi:
 $\eta = \frac{A_f}{A_g} \cdot 100\% = \frac{mgh}{Fl} \cdot 100\% =$
 $= \frac{1,2 \text{ kg} \cdot 10 \frac{\text{m}}{\text{s}^2} \cdot 0,2 \text{ m}}{5,4 \text{ N} \cdot 0,8 \text{ m}} \cdot 100\% = 55,6\%$
 J: $55,6\%$

10. Berilgan:
 $m_1 = 1 \text{ kg}$
 $m_2 = 2 \text{ kg}$
 $v_1 = 1 \text{ m/s}$
 $v_2 = 2 \text{ m/s}$
 $\Delta E_k = ?$

Yechilishi:
 $m_2 v_2 - m_1 v_1 = (m_1 + m_2) u$
 $u = \frac{m_2 v_2 - m_1 v_1}{m_2 + m_1} = \frac{2 \cdot 2 - 1 \cdot 1}{2 + 1} \cdot \frac{\text{m}}{\text{s}} = 1 \frac{\text{m}}{\text{s}}$
 $E_{k1} = \frac{m_1 v_1^2}{2} + \frac{m_2 v_2^2}{2} = \frac{m_1 v_1^2 + m_2 v_2^2}{2} = \frac{1 \frac{\text{m}^2}{\text{s}^2} \cdot 1 \text{ kg} + 4 \frac{\text{m}^2}{\text{s}^2} \cdot 2 \text{ kg}}{2} = \frac{9}{2} \text{ J}$
 $E_{k2} = \frac{(m_1 + m_2) u^2}{2} = \frac{3 \text{ kg} \cdot 1 \frac{\text{m}^2}{\text{s}^2}}{2} = \frac{3}{2} \text{ J}$
 $\Delta E_k = E_1 - E_2 = (\frac{9}{2} - \frac{3}{2}) \text{ J} = 3 \text{ J}$
 J: $\Delta E_k = 3 \text{ J}$

11. Berilgan:
 $m_2 = 5 \text{ kg}$
 $m_1 = 5 \cdot 10^{-3} \text{ kg}$
 $v_1 = 600 \frac{\text{m}}{\text{s}}$
 $v_2 = ?$

Yechilishi:
 $m_1 v_1 = m_2 v_2$
 $v_2 = \frac{m_1 v_1}{m_2} = \frac{5 \cdot 10^{-3} \text{ kg} \cdot 600 \frac{\text{m}}{\text{s}}}{5 \text{ kg}} = 0,6 \frac{\text{m}}{\text{s}}$
 J: $v_2 = 0,6 \frac{\text{m}}{\text{s}}$

12. Berilgan:
 $m = 12 \text{ kg}$
 $F = 6 \text{ N}$
 $t = 8 \text{ s}$
 $v = ?$
 $a = ?$

Yechilishi:
 $a = \frac{F}{m} = \frac{6 \text{ N}}{12 \text{ kg}} = 0,5 \frac{\text{m}}{\text{s}^2}$
 $v = at = 8 \text{ s} \cdot 0,5 \frac{\text{m}}{\text{s}^2} = 4 \frac{\text{m}}{\text{s}}$
 J: $a = 0,5 \frac{\text{m}}{\text{s}^2}$
 $v = 4 \frac{\text{m}}{\text{s}}$

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13-bilet

Bevilgan:

$$a = 4,9 \frac{m}{s^2}$$

$$h_1 = h_2 = \frac{h}{2}$$

Tapshiruvchi:

$$\mu = ?$$

Formulasi:

$$t_1 = t_2$$

$$h_1 = h_2 = \frac{h}{2}$$

$$\frac{h_1}{t_1} = \frac{h_2}{t_2}$$

$$h_1 = h_2$$

$$m \vec{a} = \mu m \vec{g}$$

$$\vec{a} = \mu \vec{g}$$

$$\mu = \frac{a}{g} = \frac{4,9 \frac{m}{s^2}}{10 \frac{m}{s^2}} = 0,49$$

Javob: $\mu = 0,49$

14-bilet

Bevilgan:

$$h_1 = 1100m$$

$$t = 10s$$

$$h_2 = 120m$$

Tapshiruvchi:

$$h = ?$$

Formulasi:

$$\Delta h = h_1 - h_2 = (1100 - 120)m =$$

$$= 980m$$

$$\Delta h = v t + \frac{g t^2}{2}$$

$$980 = 10v + 490$$

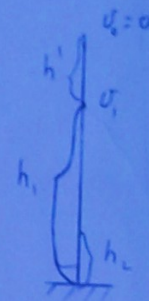
$$490 = 10v,$$

$$v = 49 \frac{m}{s}$$

$$t = \frac{v}{g} = 5s$$

$$h' = \frac{v \cdot 25}{2} = 122,5m$$

$$h = (122,5 + 1100)m = 1222,5m$$



16-bilet

Bevilgan:

$$t_1 = 5s$$

$$S_1 = 25m$$

$$S_2 = 400m$$

$$t_2 = ?$$

Formulasi:

$$a = \frac{2S_1}{t_1^2} = \frac{2 \cdot 25m}{25s^2} = 2 \frac{m}{s^2}$$

$$t_2 = \sqrt{\frac{2S_2}{a}} = \sqrt{\frac{2 \cdot 400m}{2 \frac{m}{s^2}}} = 20s$$

J: $t = 20s$

17. Berilgan:

$$r = 0,25 \text{ m}$$

$$\omega = 45^\circ/\text{s}$$

$$v = ? \quad \omega = ?$$

Formulasi:

$$v = 2\pi r \omega = 2 \cdot 3,14 \cdot 0,25 \text{ m} \cdot 45^\circ/\text{s} = 6,28 \frac{\text{m}}{\text{s}}$$

$$\omega = 2\pi R = \frac{\pi}{2} = \frac{3,14}{2} = 1,57 \frac{\text{rad}}{\text{s}}$$

$$v: v = 6,28 \frac{\text{m}}{\text{s}}$$

$$\omega = 1,57 \frac{\text{rad}}{\text{s}}$$

18. Berilgan:

$$S = 4000 \text{ m}^2$$

$$h = 1,5 \text{ m}$$

$$\rho_s = 1030 \frac{\text{kg}}{\text{m}^3}$$

$$m = ?$$

Formulasi:

$$F_A = F_{og}$$

$$\rho_s \cdot v \cdot g = m \cdot g$$

$$\rho_s \cdot S \cdot h = m$$

$$m = 1030 \frac{\text{kg}}{\text{m}^3} \cdot 4000 \text{ m}^2 \cdot 1,5 \text{ m} = 6000 \cdot 1030 \text{ kg} = 618 \cdot 10^4 \text{ kg} = 6180 \text{ t}$$

$$J: m = 6180 \text{ t}$$

19. Berilgan:

$$\rho_y = 700 \frac{\text{kg}}{\text{m}^3}$$

$$n = 12$$

$$\rho_s = 10^3 \frac{\text{kg}}{\text{m}^3}$$

$$a = 4 \text{ m}$$

$$b = 0,3 \text{ m}$$

$$d = 0,25 \text{ m}$$

$$F = 10^4 \text{ N}$$

Formulasi:

$$P_i = F_A - mg = (\rho_s - \rho_y) n \cdot v \cdot g =$$

$$= (\rho_s - \rho_y) n \cdot a \cdot b \cdot d \cdot g = 300 \frac{\text{kg}}{\text{m}^3} \cdot 12 \cdot 4 \text{ m} \cdot 0,3 \text{ m} \cdot$$

$$0,25 \text{ m} \cdot 10 \frac{\text{m}}{\text{s}^2} = 10800 \text{ N}$$

$$P_i > F$$

J: kōtara oladi:

Kōtara oladimi?

20. Berilgan:

$$F_1 = 10 \text{ kN} = 10^4 \text{ N}$$

$$F_2 = 30 \text{ kN} = 3 \cdot 10^4 \text{ N}$$

$$a_1 = 0,5 \frac{\text{m}}{\text{s}^2}$$

Topishi kerak

$$a_2 = ?$$

Yechilishi:

$$F_1 = m_1 a_1$$

$$F_2 = m_2 a_2$$

$$m_1 = \frac{F_1}{a_1} \quad m_2 = \frac{F_2}{a_2}$$

$$\frac{F_1}{a_1} = \frac{F_2}{a_2} \quad a_2 = \frac{F_2 a_1}{F_1} = \frac{3 \cdot 10^4 \text{ N} \cdot 0,5 \frac{\text{m}}{\text{s}^2}}{10^4 \text{ N}} = 1,5 \frac{\text{m}}{\text{s}^2}$$

Y: $a_2 = 1,5 \frac{\text{m}}{\text{s}^2}$

21. Berilgan:

$$t = 10 \text{ s}$$

$$S = 150 \text{ m}$$

$$v_m = 3 v_0$$

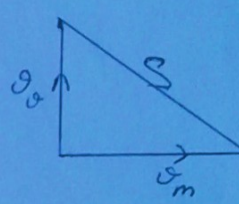
$v_m = ?$

Yechilishi:

$$S = v \cdot t$$

$$v = \sqrt{v_0^2 + v_m^2} = \sqrt{\frac{v_m^2}{9} + v_m^2} = \frac{\sqrt{10} v_m}{3}$$

$$150 \text{ m} = \frac{\sqrt{10}}{3} v_m \cdot 10 \text{ s}$$

$$45 = \sqrt{10} v_m \quad \text{Y: } v_m = \frac{45 \text{ m}}{\sqrt{10} \text{ s}}$$


22. Berilgan:

$$CB = 30 \text{ km}$$

$$AD = 18 \text{ km}$$

$S = ?$

Yechilishi:

$$S = x$$

$$t_1 = t_2 \Rightarrow \frac{x-30}{v_1} = \frac{30}{v_2}$$

$$t_1' = t_2' \Rightarrow \frac{30+x-18}{v_1} = \frac{x}{v_2}$$

$$= \frac{x^2 - 30x + 18}{v_2}$$


$$\frac{x-30}{x+12} = \frac{30}{x-12}$$

$$x^2 - 42x + 360 = 30x + 360$$

$$x^2 - 72x = 0$$

$$x = 0 \quad x = 72 \text{ km}$$

Y: $x = S = 72 \text{ km}$



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24. Berilgan:

$$S_1 = 8 \text{ cm}^2 = 8 \cdot 10^{-4} \text{ m}^2$$

$$S_2 = 800 \text{ cm}^2 = 8 \cdot 10^{-2} \text{ m}^2$$

$$F_1 = 600 \text{ N}$$

$$F_2 = 54 \text{ kN} = 54 \cdot 10^3 \text{ N}$$

$$n_1 = ? \quad n_2 = ?$$

Yechilishi:

$$P_1 = P_2$$

$$\frac{F_1}{S_1} = \frac{F_2'}{S_2}$$

$$F_2' = \frac{F_1 S_2}{S_1} = \frac{600 \text{ N} \cdot 8 \cdot 10^{-2} \text{ m}^2}{8 \cdot 10^{-4} \text{ m}^2} =$$

$$= 60000 \text{ N}$$

$$n_1 = \frac{F_2'}{F_1} = \frac{60000 \text{ N}}{600 \text{ N}} = 100$$

$$n_2 = \frac{F_2}{F_1} = \frac{54 \cdot 10^3}{600} = 90$$

$$y: n_1 = 100$$

$$n_2 = 90$$

25. Berilgan:

$$h_1 = 408 \text{ m}$$

$$h_2 = 192 \text{ m}$$

$$h_3 = 100 \text{ m}$$

$$\Delta p = 9 \text{ mm Hg}$$

$$P_0 = 760 \text{ mm Hg}$$

$$P_1 = ?$$

Yechilishi:

$$\Delta p_1 = \frac{h_1 + h_2}{h} = \Delta p = 54 \text{ mm Hg}$$

$$P_1 = P_0 - \Delta p_1 = 706 \text{ mm Hg}$$

$$y: P_1 = 706 \text{ mm Hg}$$

26. Berilgan:

$$h_1 = 13,6 \text{ sm} =$$

$$= 13,6 \cdot 10^{-2} \text{ m}$$

$$\rho_{\text{sim}} = 13,6 \cdot 10^3 \text{ kg}$$

$$\rho_{\text{suw}} = 1000 \frac{\text{kg}}{\text{m}^3}$$

Topish kerak

$$h_2 = ?$$

Formulasi:

$$P_1 = P_2$$

$$\rho_{\text{sim}} \cdot g \cdot h_2 = \rho_{\text{suw}} \cdot g \cdot h_1$$

$$h_2 = \frac{\rho_{\text{suw}} \cdot h_1}{\rho_{\text{sim}}} = \frac{10^3 \frac{\text{kg}}{\text{m}^3} \cdot 13,6 \cdot 10^{-2} \text{ m}}{13600 \frac{\text{kg}}{\text{m}^3}} =$$

$$= \frac{136}{13600} \text{ m} = 10^{-2} \text{ m} = 1 \text{ sm}$$

Javob: $h_2 = 1 \text{ sm}$

27. Berilgan:

$$m = 10 \text{ kg}$$

$$F = 30 \text{ N}$$

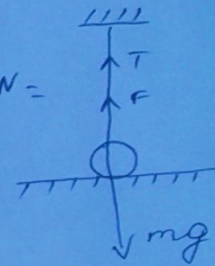
$$T = ?$$

$$mg = T + F$$

$$T = mg - F = 100 \text{ N} - 30 \text{ N} =$$

$$= 70 \text{ N}$$

$$J: T = 70 \text{ N}$$



28. Berilgan:

$$m_1 = 500 \text{ kg}$$

$$m_2 = 300 \text{ kg}$$

$$m_3 = 700 \text{ kg}$$

$$\rho_m = ?$$

Formulasi:

$$m_1 + m_2 = m_3 + m_5$$

$$m_5 = m_1 + m_2 - m_3$$

$$m_5 = 800 \text{ kg} - 700 \text{ kg} = 100 \text{ kg}$$

$$m_5 = \rho_s \cdot V_s$$

$$V_s = \frac{m_5}{\rho_s \cdot g} = \frac{100 \text{ kg}}{10^3 \frac{\text{kg}}{\text{m}^3}} = 10^{-1} \text{ m}^3$$

$$V_s = V_m$$

$$V_m = 10^{-1} \text{ m}^3$$

$$m_2 = \rho_m \cdot V_m$$

$$\rho_m = \frac{m_2}{V_m} = \frac{300 \text{ kg}}{10^{-1} \text{ m}^3} = 3000 \frac{\text{kg}}{\text{m}^3} \quad J: 3000 \frac{\text{kg}}{\text{m}^3}$$

30 Berilgan:

$$m_1 = 7,2 \cdot 10^6 \text{ kg}$$

$$h_1 = 300 \text{ m}$$

$$\rho_2 = \frac{\rho_1}{2}$$

$$h_2 = 0,3 \text{ m}$$

$$m_2 = ?$$

Formulasi:

$$\frac{V_1}{V_2} = \left(\frac{h_1}{h_2}\right)^3 \cdot \frac{m_1}{m_2} = \frac{\rho_1 V_1}{\rho_2 V_2}$$

$$= \frac{\rho_1 V_1}{\frac{\rho_1}{2} V_2} = 2 \cdot \frac{V_1}{V_2} = \left(\frac{h_1}{h_2}\right)^3 \cdot 2 =$$

$$= \frac{7,2 \cdot 10^6 \text{ kg}}{m_2}$$

$$m_2 = \frac{7,2 \cdot 10^6 \text{ kg}}{2 \cdot 10^9} = 3,6 \cdot 10^{-3} \text{ kg} =$$

$$= 3,6 \text{ g}$$

$$\text{J: } m_2 = 3,6 \text{ g}$$

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