

FÍSICA A

Aula 28

	0	1	2	3	4	5	6	7	8	9
0		d	d	b	b	c	b	*	c	b
1	b	b	b	d	c	e				

01. d

02. d

$$d = \frac{m}{V} = \frac{100}{50} = 2,0 \text{ g/cm}^3$$

$$\mu = \frac{m}{V} = \frac{100}{(50-10)} = 2,5 \text{ g/cm}^3$$

03. b

$$P = \frac{F}{A}$$

$$150 = \frac{F}{0,1^2}$$

$$F = 1,5 \text{ N}$$

04. b

05. c

06. b

$$\frac{\mu_1}{\mu_2} = \frac{h_2}{h_1}$$

$$\frac{\mu_1}{13,6} = \frac{2}{18}$$

$$\mu_1 \cong 1,5 \text{ g/cm}^3$$

07. 100

$$P^G = P_0 + h$$

$$P^G = 76 + 24$$

$$P^G = 100 \text{ cmHg}$$

(em que $h \rightarrow \text{cmHg}$)

08. c

09. b

10. b

11. b

$$\frac{F_1}{A_1} = \frac{F_2}{A_2}$$

$$\frac{600}{30} = \frac{F_2}{70}$$

$$F_2 = 1400 \text{ N}$$

12. b

$$\frac{F_1}{A_1} = \frac{F_2}{A_2}$$

$$\frac{900}{\pi \cdot 4^2} = \frac{F_2}{\pi \cdot 16^2}$$

$$F_2 = 14400 \text{ N}$$

13. d

$$x_1 \cdot A_1 = x_2 \cdot A_2$$

$$8 \cdot \frac{\pi \cdot 4^2}{4} = x_2 \cdot \frac{\pi \cdot 16^2}{4}$$

$$x_2 = 0,5 \text{ cm}$$

14. c

$$\frac{F_A}{A_A} = \frac{F_B}{A_B}$$

$$\frac{m_A \cdot g}{a} = \frac{m_B \cdot g}{b}$$

$$\frac{4}{80} = \frac{m_B}{20}$$

$$m_B = 1 \text{ kg}$$

15. e

A prensa hidráulica é um dispositivo que multiplica força.

Aula 29

	0	1	2	3	4	5	6	7	8	9
0		e	a	e	b	b	b	b	e	a
1	a	25	c	a	b	d	*	47	b	

01. e

02. a

Pois ambas têm volumes iguais.

03. c

Os três corpos têm volumes iguais.

04. b

A massa específica da água salgada é maior do que a da água doce.

05. b

$$\mu_{\text{gelo}} > \mu_{\text{óleo}}$$

$$\mu_{\text{gelo}} < \mu_{\text{água}}$$

06. b

07. b

$$E = \mu_L \cdot V_L \cdot g$$

$$E = 8 \cdot 10^2 \cdot 2 \cdot 10^{-3} \cdot 10$$

$$E = 16 \text{ N}$$

08. e

$$E = \mu_L \cdot V_L \cdot g$$

$$15 = 1,2 \cdot 10^3 \cdot V_L \cdot 10$$

$$V_L = 1,25 \cdot 10^{-3} \text{ m}^3$$

$$E = \mu_L \cdot V_L \cdot g$$

$$E = 0,8 \cdot 10^3 \cdot 1,25 \cdot 10^{-3} \cdot 10$$

$$E = 10 \text{ N}$$

09. a

$$P_{ap} = P - E$$

10. a

$$P_{ap} = P - E$$

$$30 = 50 - E$$

$$E = 20 \text{ N}$$

11. 25

$$P_{ap} = P - E$$

$$0,5 = 0,8 - E$$

$$E = 0,3 \text{ N}$$

$$E = \mu_L \cdot V_L \cdot g$$

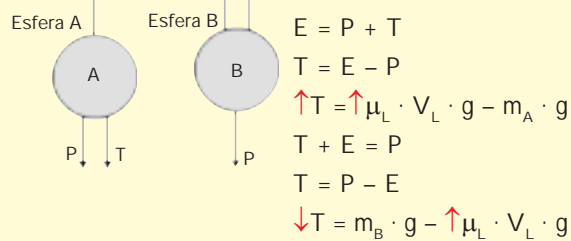
$$0,3 = 1,2 \cdot 10^3 \cdot V \cdot 10$$

$$V = 25 \cdot 10^{-6} \text{ m}^3 = 25 \text{ cm}^3$$

12. c

Indicação do dinamômetro = P_{ap}
 $P_{ap} = P - E$

13. a

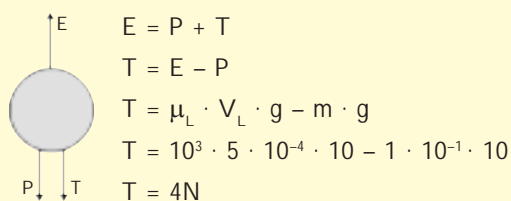


14. b

15. d

$$\downarrow E = \mu_L \cdot V_L \cdot g$$

16.

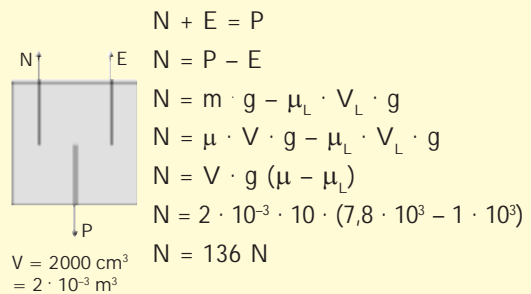


17. 47

$$01 + 02 + 04 + 08 + 32$$

01. $P = m \cdot g = 0,5 \cdot 10 = 5 \text{ N}$
 02. $E = \mu_L \cdot V_L \cdot g = 10^3 \cdot 2 \cdot 10^{-4} \cdot 10 = 2 \text{ N}$
 04. $\mu = \frac{m}{V} = \frac{0,5}{2 \cdot 10^{-4}} = 2,5 \cdot 10^3 \text{ kg/m}^3$
 32. $R = m \cdot a$
 $P - E = m \cdot a$
 $5 - 2 = 0,5 \cdot a$
 $a = 6 \text{ m/s}^2$
 $v^2 = v_0^2 + 2a\Delta x$
 $v^2 = 0^2 + 2 \cdot 6 \cdot 5$
 $v \cong 7,7 \text{ m/s (10m/s)}$

18. b



Aula 30

	0	1	2	3	4	5	6	7	8	9
0		d	52	e	b	b	75	b	c	d
1	*	*	c	b	76					

01. d

02.

04 - } pois o volume deslocado pela esfera ma-
 16 - } çica é maior do que o deslocado pela es-
 32 - } fera oca.

52

03. e

Maior massa específica (água salgada) implica em empuxo maior.

04. b

$$d = \frac{V_s}{V}$$

$$d = \frac{3/4 V}{V}$$

$$d = \frac{3}{4} = 0,75 \therefore \mu_c = 0,75 \text{ g/cm}^3$$

05. b

$$V_s = 100 - 44 = 56\% \rightarrow \mu_c = 0,56 \text{ g/cm}^3$$

06. 75

$$d = \frac{V_s}{V}$$

$$\frac{1}{4} = \frac{V_s}{V}$$

$$V_s = 0,25 V \rightarrow 25\%$$

∴ Volume emerso = 75%

07. b

$$\frac{\mu_c}{\mu_L} = \frac{V_s}{V}$$

$$\frac{d}{3d} = \frac{V_s}{V}$$

$$\frac{2}{3} = \frac{V_s}{V}$$

$$V_s = \frac{2V}{3}$$

08. c

$$V_s = 100 - 10 = 90\% V = 0,9 V$$

$$\frac{\mu_c}{\mu_L} = \frac{V_s}{V}$$

$$\frac{\mu_c}{1,03} = \frac{0,9V}{V}$$

$$\mu_c \cong 0,93 \text{ g/cm}^3$$

09. d

$$V_L = \frac{0,8}{2} = 0,4 \text{ m}^3$$

$$E = \mu_L \cdot V_L \cdot g$$

$$E = 1000 \cdot 0,4 \cdot 10$$

$$E = 4000 \text{ N}$$

10. a) $P_2 > P_1$

b) O peso da água escoada é menor que o peso da pedra.

11. a) $P_2 = P_1$

b) O peso da água escoada é igual ao peso do bloco de madeira (corpo flutuante).

12. c

$$\frac{\mu_c}{\mu_L} = \frac{V_s}{V}$$

$$\frac{\mu_c}{1,2} = \frac{2/3V}{V}$$

$$\mu_c = 0,8 \text{ g/cm}^3$$

$$\frac{\mu_c}{\mu_L} = \frac{V_s}{V}$$

$$\frac{0,8}{\mu_L} = \frac{2/4 V}{V}$$

$$\mu_L = 1,6 \text{ g/cm}^3$$

13. b

$$60\% \text{ submerso} \rightarrow \mu_c = 0,6 \text{ g/cm}^3$$

$$\frac{\mu_c}{\mu_L} = \frac{V_s}{V}$$

$$\frac{0,6}{0,75} = \frac{V_s}{200}$$

$$V_s = 160 \text{ cm}^3$$

14. 76

$$\mu_c = \frac{m}{V} = \frac{m_1 + m_2}{Ax(h_1 + h_2)}$$

$$\mu_c = \frac{4 \cdot 10^3 + 13,4 \cdot 10^3}{200 \cdot (13 + 150)}$$

$$\mu_c \cong 0,5337 \text{ g/cm}^3$$

$$\frac{\mu_c}{\mu_L} = \frac{V_s}{V}$$

$$\frac{0,5337}{1} = \frac{V_s}{32600}$$

$$V_s \cong 17398 \text{ cm}^3$$

$$h = \frac{17398}{200} = 87 \text{ cm}$$

$$\therefore H = 163 - 87$$

$$H = 76 \text{ cm}$$

Testes complementares

	0	1	2	3	4	5	6	7	8	9
0		01	b	c	a	b	a	*	*	e

01. 01

$$A = 1 \text{ mm}^2 = 10^{-6} \text{ m}^2$$

$$p_{ef} = \mu \cdot g \cdot h = 10^3 \cdot 10 \cdot 100 = 10^6 \text{ Pa}$$

$$p = \frac{F}{A}$$

$$10^6 = \frac{F}{10^{-6}} \therefore F = 1 \text{ N}$$

02.

$$p_{ef} = 1,3 \cdot 10^5 - 1 \cdot 10^5 = 0,3 \cdot 10^5 \text{ Pa}$$

Na Terra:

$$p_{ef} = \mu \cdot g \cdot h$$

$$0,3 \cdot 10^5 = 10^3 \cdot 10 \cdot h$$

$$h = 3 \text{ m}$$

Na Lua:

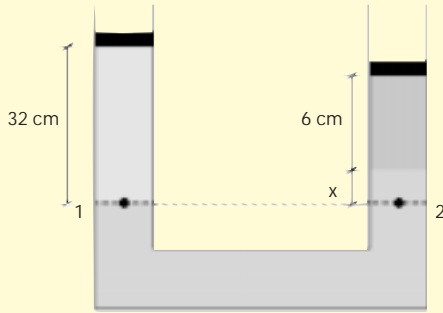
$$p_{abs} = P_{ef} + P_0$$

$$p_{abs} = \mu \cdot g \cdot h + 0$$

$$p_{abs} = 10^3 \cdot \frac{10}{6} \cdot 3$$

$$p_{abs} = 5 \cdot 10^3 \text{ Pa}$$

03. c



$$p_1 = p_2$$

$$10^3 \cdot g \cdot 0,32 = 13,6 \cdot 10^3 \cdot g \cdot x + 0,8 \cdot 10^3 \cdot g \cdot 0,06$$

$$0,32 = 13,6 x + 0,048$$

$$x = 0,2 \text{ m}$$

$$x = 2 \text{ cm}$$

Logo: desnível = $32 - 6 - 2 = 24 \text{ cm}$

04. a

$$\frac{F_1}{F_2} = \frac{A_1}{A_2} = \frac{(\pi d_1^2 / 4)}{(\pi d_2^2 / 4)} = \frac{(2d_2)^2}{(d_2)^2} = 4$$

05. b

$$\frac{F_1}{A_1} = \frac{F_2}{A_2} ; A_2 = 0,04 \text{ m}^2 = 400 \text{ cm}^2$$

$$\frac{50}{20} = \frac{F_2}{400}$$

$$F_2 = 1000 \text{ N}$$

06. a

$$\frac{F_1}{A_1} = \frac{F_2}{A_2}$$

$$\frac{A_2}{A_1} = \frac{F_2}{F_1}$$

$$\frac{\pi \cdot R_2^2}{\pi \cdot R_1^2} = \frac{100 \cdot F_1}{F_1}$$

$$\left(\frac{R_2}{R_1}\right)^2 = 100 \therefore \frac{R_2}{R_1} = 10$$

07.

a. $E = \mu_L \cdot V \cdot g$

$$E = 10^3 \cdot 2 \cdot 10^{-4} \cdot 10$$

$$E = 2 \text{ N}$$

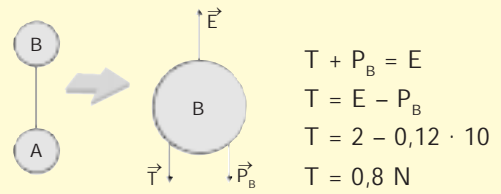
Onde:

$$\mu = \frac{m}{V}$$

$$0,6 \cdot 10^3 = \frac{0,12}{V}$$

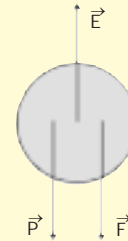
$$V = 2 \cdot 10^{-4} \text{ m}^3$$

b.



08.

a.



b. $F + P = E$

$$F = E - P$$

$$F = \mu_L \cdot V \cdot g - m \cdot g$$

$$F = 10^3 \cdot 5 \cdot 10^{-6} \cdot 10 - 4 \cdot 10^{-3} \cdot 10$$

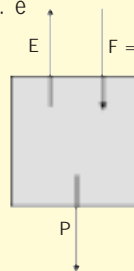
$$F = 1 \cdot 10^{-2} \text{ N}$$

$$F = k \cdot x$$

$$1 \cdot 10^{-2} = 5 \cdot 10^{-1} \cdot x$$

$$x = 2 \cdot 10^{-2} \text{ m}$$

09. e



$$F + P = E$$

$$F = E - P$$

$$F = \mu_L \cdot V \cdot g - m \cdot g$$

$$F = 10^3 \cdot 0,02 \cdot 10 - 6 \cdot 10$$

$$F = 140 \text{ N}$$