1. (B)

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

$836 = \frac{P}{40}$

$P = 836 \cdot (40)\ W$

$P = \frac{E}{\Delta t}$ ← $Q = mc\Delta T$

$836 \cdot 40 = \frac{40 \cdot 1 \cdot 10^6 \cdot 4,2 \cdot (19-17)}{\Delta t}$

$\therefore \Delta t = 10^4\ s$

2. (A)

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

$1000 = \frac{P_T}{10}$

$P_T = 10^4\ W$

$\eta = \frac{P_U}{P_T}$

$0,5 = \frac{P_U}{10^4}$

$P_U = 5000\ W$

$P = \frac{E}{\Delta t}$ ← $Q = mc\Delta T$

$5000 = \frac{60000 \cdot 4,2 \cdot \Delta T}{60}$

$\therefore \Delta T \cong 12\,^\circ C$

3. (A)

$P = \frac{E}{\Delta t}$ ← $Q = mc\Delta T$

$P = \frac{1000 \cdot 4200 \cdot (100-80)}{3600}$

$P = \frac{280\,000}{3}\ W$

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

$800 = \frac{\left(\frac{280\,000}{3}\right)}{6 \cdot x}$

$\therefore x \cong 19,4\ m$

4

a) $A = \frac{F}{F-P}$

$\frac{i}{1,4 \cdot 10^{-9}} = \frac{0,15}{0,15 - 1,5 \cdot 10^{11}}$

$\therefore i = -0,0014\ m$

$i = -1,4\ mm$

b) $I = \frac{P}{A}$

$1000 = \frac{P_{lente}}{0,05^2 \cdot \pi}$

$P_{lente} = 2,5\pi\ W$

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

$I = \frac{2,5\pi}{\pi(0,7 \cdot 10^{-3})^2}$

$I \cong 5,1 \cdot 10^6\ \frac{W}{m^2}$

5. a) $A = \frac{i}{F - p}$

$\frac{i}{1,5.10^3} = \frac{15}{15 - 1,5.10^{11}}$

$\therefore i \cong -0,15\ m$

b) $I = \frac{F}{A}$

$1000 = \frac{P_{espelho}}{\pi \left(\frac{10}{2}\right)^2}$

$\therefore P_{esp} = 75000W$

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

$I = \frac{75000}{3\left(\frac{0,15}{2}\right)^2}$

$I \cong 4,4.10^6\ W/$

c) $P = \frac{E}{\Delta t}$

$75000 = \frac{600 . 1 . \Delta T}{4}$

$\therefore \Delta T = 500\ K$

6. D

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

$1000 = \frac{P_T}{9}$

$\therefore P_T = 9000W$

$\eta = \frac{P_u}{P_T}$

$0,3 = \frac{P_u}{9000}$

$P_u = 2700W$

$P = \frac{\tau}{\Delta t}$ $\tau_R =$

$2700 = \frac{\frac{200 . 3}{2}}{\Delta}$

$\therefore \Delta t \cong 33$

7. A

8. E

9. A

10. D

11. As ondas de rádio em AM difratam com maior facilidade já que o comprimento de onda é da ordem da dimensão de prédios e montanhas. As ondas de rádio em FM difratam menos.

12. $v = \lambda \cdot f$

B $0{,}06 = 0{,}06 \cdot f$

$\therefore f = 1\ Hz$

13. B

14. A

15. a) $d = \frac{\lambda}{2}$

$12 = \frac{\lambda}{2}$

$\therefore \lambda = 24\ cm$

b) $v = \sqrt{\frac{F_T}{\mu}}$

$v = \sqrt{\frac{0{,}18 \cdot 10}{5 \cdot 10^{-4}}}$

$v = 60\ m/s$

$v = \lambda \cdot f$

$60 = 0{,}24 \cdot f$

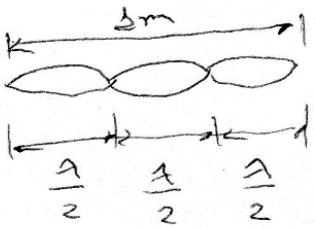
$f = 250\ Hz$

16. E

$v = \sqrt{\frac{F_T}{\mu}}$

$v = \sqrt{\frac{3}{3 \cdot 10^{-4}}}$

$v = 100\ m/s$



$3\frac{\lambda}{2} = 1$

$\therefore \lambda = \frac{2}{3}\ m$

$v = \lambda \cdot f$

$100 = \frac{2}{3} \cdot f$

$\therefore f = 150\ Hz$