

PAG. 932 N 23

$$E = 500 \text{ J}$$

$$I = \frac{P}{4\pi r^2}$$

$$\Delta t = 1,0 \text{ min} = 60 \text{ s}$$

$$I_A = ? \quad I_C = ? \quad r_A = 10 \text{ m} \quad r_C = 20 \text{ m}$$

$$I_A = \frac{500 \text{ J}}{(60 \text{ s}) \cdot 4\pi \cdot (10 \text{ m})^2} = 6,6 \times 10^{-3} \frac{\text{W}}{\text{m}^2}$$

$$I_C = \frac{I_A}{4} = 1,7 \times 10^{-3} \frac{\text{W}}{\text{m}^2}$$

N 25

$$r_L = 15 \text{ m} \quad L_L = 70 \text{ dB}$$

$$r_H = 5,0 \text{ m} \quad L_H = ?$$

$$I_0 = 10^{-12} \frac{\text{W}}{\text{m}^2}$$

$$L_L = 10 \log_{10} \frac{I_L}{I_0}$$

$$\frac{L_L}{10} = \log_{10} \frac{I_L}{I_0}$$

$$10^{\frac{L_L}{10}} = \frac{I_L}{I_0}$$

$$I_L = I_0 \cdot 10^{\frac{L_L}{10}}$$

$$I_L \cdot r_L^2 = I_H \cdot r_H^2$$

$$I_H = \frac{I_L \cdot r_L^2}{r_H^2}$$

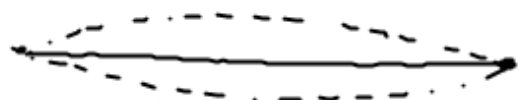
$$L_H = 10 \log \frac{I_H}{I_0} =$$

$$= 10 \log \frac{I_L \cdot r_L^2}{r_H^2 \cdot I_0} =$$

$$= 10 \log \frac{\cancel{I_0} \cdot 10^{\frac{L_L}{10}} \cdot r_L^2}{r_H^2 \cdot \cancel{I_0}} = 10 \log (10^7 \cdot 9) =$$

$$= 10 [\log 10^7 + \log 9] = 10 [7 + \log 9] = 80 \text{ dB}$$

N 41



$$L = 75,0 \text{ cm} = 0,750 \text{ m}$$

$$f_1 = 410 \text{ Hz} \quad n=1$$

$$v = ?$$

$$\lambda_n = \frac{2L}{n} \quad n=1,2,3,\dots$$

$$f_n = \frac{nv}{2L}$$

$$\frac{2L \cdot f_1}{1} = v$$

$$v = 2 \cdot 0,750 \text{ m} \cdot 410 \text{ Hz}$$

$$v = 615 \text{ m/s}$$

57

$$f^* = 5 \text{ Hz}$$

$$f_2 > f_1$$

$$f_2 = 410 \text{ Hz}$$

$$1) |f_2 - f_1| = 5 \text{ Hz}$$

$$f_2 - f_1 = \pm 5 \text{ Hz}$$

$$f_1 = f_2 + 5 \text{ Hz} \quad \vee \quad f_1 = f_2 - 5 \text{ Hz} = 405 \text{ Hz}$$

$= 415 \text{ Hz}$
NON ACC.

$$2) f^* = 3 \text{ Hz} \quad f_1 = 405 \text{ Hz}$$

$$f_2 = f_1 + 3 \text{ Hz} = 408 \text{ Hz}$$

61

$$f_s = 1,25 \times 10^3 \text{ Hz}$$

$$v = 31,6 \frac{\text{m}}{\text{s}}$$

$$v_0 = 340 \frac{\text{m}}{\text{s}}$$



$$f' = ?$$

$$f' = \frac{v_0}{v_0 + v} f = \frac{340}{340 + 31,6} \cdot 1,25 \times 10^3 \text{ Hz} = 1,14 \times 10^3 \text{ Hz}$$

62

$$v = 108 \frac{\text{km}}{\text{h}}$$

$$f_s = 900 \text{ Hz}$$

$$1) f' = \frac{v_0}{v_0 - v} f =$$

$$= \frac{340}{340 - \frac{108}{3,6}} \cdot 900 \text{ Hz} = 987 \text{ Hz}$$

$$2) f' = \frac{v_0}{v_0 + v} f = \frac{340}{340 + \frac{108}{3,6}} \cdot 900 \text{ Hz} = 827 \text{ Hz}$$