Sound HW pg 324 #1-3 pg 325 # 1-3 pg 328 #1, 2

pg 332 # 8, 9, 13, 16

1] $\Delta d = 2.56m \times 2$

$= 5.12m$

$\Delta t = ?$

$T = 20.0°c$

$V = ?$

$V = 331.6\,m/s + (0.606\,^{m/s}/_{°c})(20.0°c)$

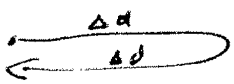
$= 343.72\,m/s$

$\Delta t = \frac{2\Delta d}{V} = \frac{5.12m}{343.72\,m/s} = \underline{0.0149s}$

2] $\Delta t_{2way} = 0.0112s$

$V = 344\,m/s$

$\Delta d = ?$



$V = \frac{2\Delta d}{\Delta t_{2way}}$

$\Delta d = \frac{V\Delta t}{2} = \frac{(344\,m/s)(0.0112s)}{2}$

$= 1.93m$

3] $\Delta d = 12.8m$

$\Delta t = 0.0382s$

$V = ?$

$V = \frac{\Delta d}{\Delta t} = \frac{12.8m}{0.0382s} = 335\,m/s$

pg 325 # 1-3

1] $T = -20.0°c$

$V = ?$

$V = 331.6 + (-20.0)(0.606)$

$= 319.48\,m/s$

$\simeq 319\,m/s$

2] $f = 225Hz$

$T = -20.0°c$

$V = ?$

$\lambda = ?$

$V = 319.48\,m/s$ from # 1

$\lambda = \frac{V}{f} = \frac{319.48\,m/s}{225\,Hz} = 1.4199m \simeq 1.42m$

3] $\lambda = 38\text{ cm} = 0.38\text{ m}$ $\quad v = f\lambda = (1000\text{ Hz})(0.38\text{ m})$

$f = 1000\text{ Hz}$ $\quad = 380\text{ m/s}$

$v = ?$

$T = ?$

$$v = 331.6 + 0.606T$$

$$T = \frac{v - 331.6}{0.606} = \frac{380\text{ m/s} - 331.6\text{ m/s}}{(0.606)}$$

$$= 79.86\,^\circ C$$

$$\simeq \underline{80.\,^\circ C}$$

<u>pg 328 # 1, 2</u>

1] $\Delta I_{level} = 77\text{ dB} - 68\text{ dB} = 9\text{ dB}$

$$9\text{ dB} \div 10\frac{\text{dB}}{\text{B}} = 0.9\text{ B}$$

$$\text{Intensity change} = 10^{0.9} = 7.943 \simeq \underline{8\times}$$

2] $5\times10^{-6}\text{ W/m}^2 \rightarrow 5\times10^{-7}\text{ W/m}^2$ represents an intensity level decrease as the exponent has become <u>smaller</u>.

<u>pg 332 # 8, 9, 10, 13, 16</u>

8] Noise induced hearing loss refers to lost hearing sensitivity due to damage to the inner ear cilia as a result of prolonged exposure to loud sounds.

9] Sound Intensity – the sound energy passing a given area per unit Time (W/m^2)

Sound Intensity level – a logarithmic value representing the exponent of sound intensity (B or dB)

10] $T = 10.0°C$ $\quad V = ?$

$V = 331.6\,m/s + (0.606\,\frac{m/s}{°C})(10.0°C)$

$= 337.66\,m/s$

$\simeq 338\,m/s$

13] $T = -30.0°C$

$\Delta t_{2way} = 4.00s$

$V = ?$

$\Delta d = ?$

$V = 331.6\,m/s + (0.606)(-30.0°C)$

$= 313.42\,m/s$

$\frac{2\Delta d}{\Delta t_{2way}} = V$

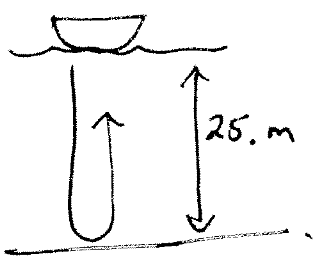
$\Delta d = \frac{V \cdot \Delta t_{2way}}{2} = \frac{(313.42\,m/s)(4.00s)}{2}$

$= 626.84\,m$

$\simeq \underline{627m}$

∴ the reflecting surface was 627m away.

16]



$\Delta t_{2way} = 34.8\,ms$

$\Delta d = 2(25.m) = 50.\,m$

$V = ?$

$V = \frac{\Delta d}{\Delta t}$

$= \frac{(50.m)}{(34.8\,ms)}$

$= \frac{(50.m)}{(0.0348s)}$

$= 1436.78\,m/s$

$\simeq \underline{1.4 \times 10^3\,m/s}$

∴ the speed of sound in water is $1.4 \times 10^3\,m/s$.