Pg 198/199 practice

1. (a) Transverse (b) longitudinal

2. (a) $T = \frac{\text{time}}{\#\text{cycles}} = \frac{15\text{ s}}{25} = \boxed{0.60\text{ s}}$

(b) $T = \frac{1}{f} = \frac{1}{15/60\text{ s}} = \frac{60\text{ s}}{15} = \boxed{4.0\text{ s}}$

$f = \frac{15\text{ shovels}}{\text{minute}}$

$f = \frac{15}{60\text{ s}}$

(c) $f = \frac{2450}{60\text{ s}} \quad \therefore T = \frac{60\text{ s}}{2450} = \boxed{2.4 \times 10^{-2}\text{ s}}$

3. $T = \frac{1}{80\text{ s}} \quad f = \frac{1}{T} = \frac{1}{1/80\text{ s}} = \boxed{80\text{ Hz}}$

4. #cycles = 20
time = 25 s

$f = \frac{\#c}{t} = \frac{20}{25\text{ s}} = \boxed{0.80\text{ Hz}}$

$T = \frac{t}{\#c} = \frac{25\text{ s}}{20} = \boxed{1.2\text{ s}}$

5. #cycles = 2.40×10^4
time = 1.00 min = 60.0 s

$f = \frac{\#c}{t} = \frac{2.40 \times 10^4}{60.0\text{ s}} = \boxed{4.00 \times 10^2\text{ Hz}}$

$T = \frac{t}{\#c} = \frac{60.0\text{ s}}{2.40 \times 10^4} = \boxed{2.50 \times 10^{-3}\text{ s}}$

6. (a) $f = \frac{88}{0.20\text{ s}} = \boxed{4.4 \times 10^2\text{ Hz}}$ (b) $f = \frac{3600}{60.0\text{ s}} = \boxed{6.0 \times 10^1\text{ Hz}}$

(c) $f = \frac{4.5 \times 10^3}{60.0\text{ s}} = \boxed{75\text{ Hz}}$

7. $T = \frac{t}{\#c} = \frac{1638\text{ d}}{6}$

$\boxed{T = 27.30\text{ days}}$

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1. (a) transverse (b) longitudinal (c) longitudinal

2. (a) transverse

(b) AMPLITUDE $= \frac{17\text{cm}}{2} = \boxed{8.5\text{cm}}$

(c) distance per cycle $= 2 \times 17\text{cm} = 34\text{cm}$

distance for 5 cycles $= 5 \times 34\text{cm}$

$\boxed{d = 1.7 \times 10^{2}\text{cm}}$

3. (a) $f = \frac{\#\text{cycles}}{t} = \frac{1800}{60.0\text{s}} = \boxed{30.0\text{Hz}}$

$T = \frac{t}{\#\text{cycles}} = \frac{60.0\text{s}}{1800} = \boxed{3.33 \times 10^{-2}\text{s}}$

(b) $f = \frac{\#c}{t} = \frac{1800}{20.0\text{s}} = \boxed{90.0\text{Hz}}$ $T = \frac{1}{f} = \frac{1}{90}$

$\boxed{T = 1.11 \times 10^{-2}\text{s}}$

(c) f range $\frac{640}{60.0\text{s}} = 10.7\text{Hz}$ to $\frac{460}{60.0\text{s}} = 7.67\text{Hz}$

$T = \frac{1}{f} = \boxed{9.38 \times 10^{-2}\text{s}}$ to $T = \frac{1}{f} = \boxed{1.30 \times 10^{-1}\text{s}}$

(d) $f = \frac{1\text{cycle}}{60.0\text{s}} = \boxed{0.017\text{Hz}}$ $\boxed{T = 60.0\text{s}}$

(e) $f = \frac{1\text{cycle}}{3600\text{s}} = \boxed{2.78 \times 10^{-4}\text{Hz}}$ $\boxed{T = 1\text{hr} = 3600\text{s}}$

4. (a) longitudinal

(b) Amplitude = $\frac{7.0\text{cm}}{2}$ = $\boxed{3.5\text{cm}}$

(c) distance in 3.5 cycles

$= 3.5 \times (2 \times 7.0\text{cm}) = \boxed{49\text{cm}}$

5. (a) $\boxed{T = \frac{1}{f}}$ (b) as length increases period increases (frequency decreases)

6. Move the mass closer to the pivot point

10. $T = 2\pi\sqrt{\frac{l}{g}}$

square both sides. $T^2 = 4\pi^2\left(\frac{l}{g}\right)$

multiply by "g" $g \times T^2 = g \times \left[4\pi^2\left(\frac{l}{g}\right)\right]$

divide by T^2 $\frac{g \times T^2}{T^2} = \frac{4\pi^2 l}{T^2}$

$\therefore g = \frac{4\pi^2(1.00\text{m})}{(2.00\text{s})^2}$

$\boxed{g = 9.87\text{m/s}^2}$