

LAMC Physical Science 1 Homework #5

This homework is due 10/20

Ch 5

Matching

c.14(radiation)

e.12(conduction)

f.1(temperature)

i.4(Kelvin Scale)

o.13(convection)

Multiple Choice

1.b

4.c

5.b

6.c

Ch 6

Matching

b.17(speed of sound)

c.10(electromagnetic spectrum)

d.5(amplitude)

f.8(period)

p.9(wave speed)

Multiple Choice

1.b

2.a

5.d

11.b

Fill in the blank

6.electromagnetic

7.longitudinal

13.natural

Ch 7

Matching

d.21(constructive interference)

f.6(refraction)

h.1(reflection)

u.3(law of reflection)

Multiple Choice

1.d

4.a

5.b

10.a

12.a

ch 5.

Ex 6.

$$(a) T_c = T_k - 273$$

$$= 3 - 273$$

$$\boxed{= -270^\circ\text{C}}$$

(b)

$$T_F = (T_c + 40) \times 1.8 - 40$$

$$= (T_c \times 1.8) + 32$$

$$= (-270^\circ\text{C} + 40) \times 1.8 - 40$$

$$\boxed{= -454^\circ\text{F}}$$

Ex 14.

$$V = 1 \text{ L}$$

$$\Delta T = 100^\circ\text{C}$$

$$C = 4186 \text{ J/kg}^\circ\text{C}$$

$$Q = m C \Delta T$$

First we need to find mass,  $m$

$$m = \text{Volume} \times \text{density}$$

$$= 1 \text{ L} \times 1 \text{ g/cm}^3$$

$$= 1000 \text{ cm}^3 \times 1 \text{ g/cm}^3$$

$$= 1000 \text{ g} = 1 \text{ kg}$$

\* Specific Heat

can be found on page 112

~~remember~~  
From the previous homework #1  
we found that 1L = 1000 cm<sup>3</sup>

$$Q = 1 \text{ kg} \times 4186 \text{ J/kg}^\circ\text{C} \times 100^\circ\text{C}$$

$$= \boxed{418,600 \text{ J}}$$

17.

$$m = 500 \text{ g}$$

$$\Delta T_1 = 10^\circ\text{C}$$

$$\Delta T_2 = 0^\circ\text{C}$$

$$\Delta T_3 = 20^\circ\text{C}$$

$$C_{\text{ice}} = 0.5 \text{ cal/g}^\circ\text{C}$$

$$C_{\text{water}} = 1 \text{ cal/g}^\circ\text{C}$$

$$L_f = 80 \text{ cal/g}$$

$$Q_1 = m C_{\text{ice}} \Delta T_1$$

$$= 500 \text{ g} \times 0.5 \text{ cal/g}^\circ\text{C} \times 10^\circ\text{C} = 2500 \text{ cal}$$

$$Q_2 = m L_f = 500 \text{ g} \times 80 \text{ cal/g} = 40,000 \text{ cal}$$

$$Q_3 = m C_{\text{water}} \Delta T_3$$

$$= 500 \text{ g} \times 1 \text{ cal/g}^\circ\text{C} \times 20^\circ\text{C} = 10,000 \text{ cal}$$

$$Q_{\text{Total}} = Q_1 + Q_2 + Q_3 = \boxed{52,500 \text{ cal}}$$

Ice at  $-10^\circ\text{C} \rightarrow$  Ice at  $0^\circ\text{C} \rightarrow$  Water at  $0^\circ\text{C} \rightarrow$  Water at  $20^\circ\text{C}$

$Q_1$

$Q_2$

$Q_3$

Ch 6.

$$\begin{aligned} \text{Ex 2. } f &= 0.25 \text{ kHz} \\ &= 250 \text{ Hz} \end{aligned}$$

$$\begin{aligned} T &= \frac{1}{f} \\ &= \frac{1}{250 \text{ Hz}} \end{aligned}$$

$$= 0.004 \text{ sec}$$

Ex 14.

$$f = 15.0 \text{ kHz}$$

$$\lambda = 0.333 \text{ m}$$

$$s = f \times \lambda$$

$$= 15000 \text{ Hz} \times 0.333 \text{ m}$$

$$= 5000 \text{ m/s}$$