

# Physics 2C

## Practice Quiz 1

These are questions from old quizzes. We did not go through conversions from Fahrenheit to Celsius etc. in class, but I have them here anyway for you to practice.

- 1) Two identical cylinders at the same temperature contain the same gas. If A contains three times as much gas as B, which cylinder has the higher pressure?  
A) cylinder A  
B) cylinder B  
C) both the same  
D) it depends on the temperature T
- 2) Two drinking glasses are stuck, one inside the other. How would you best get them unstuck?  
A) run hot water over them both  
B) put hot water into the inner one  
C) run hot water over the outer one  
D) run cold water over them both
- 4) A 621.0-g iron meteor impacts the earth at a speed of 1922.0 m/s. If its energy was entirely converted to heat of the meteorite, what will the resultant temperature rise be? (The specific heat for iron is  $447 \text{ J/kg}\cdot^\circ\text{C}$ .)  
A)  $6.30^\circ \text{C}$   
B)  $4000^\circ \text{C}$   
C)  $16,300^\circ \text{C}$   
D)  $2,430,000^\circ \text{C}$
- 6) An enclosed rabbit hutch has a thermal resistance of  $0.25 \text{ K/W}$ . If you put a  $50 \text{ W}$  heat lamp in the hutch on a day when the outside temperature is  $-15^\circ \text{C}$ , what will be the hutch temperature? Ignore the metabolism of the rabbit.  
A)  $-5^\circ \text{C}$   
B)  $-2.5^\circ \text{C}$   
C)  $0^\circ \text{C}$   
D)  $+2.5^\circ \text{C}$   
E)  $-10^\circ \text{C}$
- 8) An aerosol of whipped cream is pressurized at  $440 \text{ kPa}$  when it's refrigerated at  $3^\circ \text{C}$ . The can warns against temperatures in excess of  $50^\circ \text{C}$ . What is the maximum safe pressure for the can?  
A)  $500 \text{ kPa}$   
B)  $1000 \text{ kPa}$   
C)  $4000 \text{ kPa}$   
D)  $7000 \text{ kPa}$   
E)  $600 \text{ kPa}$



- 6) Why do large bodies of water exert a temperature moderating effect on their surroundings?
- A) Water moderates climate because it tends to be colder than air.
  - B) Large bodies of water have large heat capacity.
  - C) Water has large heat conductivity and thus provides a fixed temperature bath.
  - D) Water has small heat conductivity and thus provides a fixed temperature bath.
- 7) It is necessary to determine the specific heat of an unknown object. The mass of the object is 227.0 g. It is determined experimentally that it takes 16.0 J to raise the temperature  $10.0^{\circ}\text{C}$ . Find the specific heat of the object.
- A) 0.001,40 J/kg  $\cdot$  K
  - B) 3,630,000 J/kg  $\cdot$  K
  - C) 7.05 J/kg  $\cdot$  K
  - D) 1600 J/kg  $\cdot$  K
- 9) A blacksmith heats a 1.1kg iron horseshoe to 550 degree Celsius, then plunges it into a bucket containing 15kg of water at 20 degree Celsius. What is the final temperature? Assume that all the heat lost by the horseshoe is transferred to the water. (specific heat water = 1 cal/(gram  $\cdot$  degree C); iron = 0.107 cal/(gram  $\cdot$  degree C).
- A) 24 degree Celsius
  - B) 15 degree Celsius
  - C) 48 degree Celsius
  - D) 96 degree Celsius
- 10) How long will it take a 500W microwave oven to vaporize completely a 500g block of ice that is initially at zero degree Celsius? ( $L_f = 334 \text{ kJ/kg}$ ;  $c_w = 4.184 \text{ kJ/(kg}\cdot\text{K)}$ ,  $L_v = 2257 \text{ kJ/kg}$ )
- A) 1 min
  - B) 10 min
  - C) 1 hour
  - D) 1 day
- 9) If you put 1kg of water at 1 degree Celsius together with 0.5kg of steam at 100 degrees Celsius, what will the final temperature be after the two equilibrate? ( $L_f = 334 \text{ kJ/kg}$ ;  $c_w = 4.184 \text{ kJ/(kg}\cdot\text{K)}$ ,  $L_v = 2257 \text{ kJ/kg}$ )
- A) 0 degree celsius
  - B) 50 degree Celsius
  - C) 100 degree Celsius
  - D) between 65 and 100 degree Celsius
  - E) between 0 and 45 degree celsius

10) How much ice can a 625 W microwave melt in 1min if the ice is initially at 0 degree Celsius?  
( $L_f = 334 \text{ J/gram}$ )

- A) 0.1 kg      B) 0.5 kg      C) 1kg      D) 5 kg      E) 10 kg

1) Which is the largest unit: one Celsius degree, one Kelvin degree, or one Fahrenheit degree?

- A) one Celsius degree  
B) one Kelvin degree  
C) one Fahrenheit degree  
D) both one Celsius degree and one Kelvin degree  
E) both one Fahrenheit degree and one Celsius degree