# PracTest Heat ID#

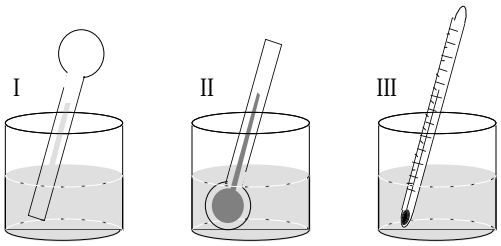
**Heat and Temperature Constants:** $k = 1.38 \times 10^{-23} J/K$ $\sigma = 5.67 \times 10^{-8} W/m^2 \cdot K^4$ $R = 8.32 J/mol \cdot K$

**Coefficients of Thermal Expansion $\times 10^{-5} 1/°C$**
Ag (silver): 2.0 Al (aluminum): 2.4 Brass: 1.8 Cu (copper): 1.7 Pb (lead): 3.0 Steel/Fe (iron): 1.2

**Thermal Conductivity in W/m·°C**
Ag: 406 Al: 205 Brass: 109 Cu: 385 Steel/Fe: 50 Brick: 0.6 Glass: 0.8 Glass Wool: 0.4

**Specific Heat of Various Substances in J/kg·°C**
Ag: 230 Al: 920 Au: 130 Cu: 390 Fe: 460 Pb: 130 $H_2O$: 4190 Glass:840

1.




Consider the three devices shown.
I. a Florence flask, partially filled with water and inverted in a beaker
II. a Florence flask, partially filled with water, sitting upright
III. an evacuated glass tube, graduated (marked with equal increments), partially filled with water
Which of these, if any, acts as a thermoscope (but **not** as a thermometer)?

A. I only B. II only C. III only D. I and II only
E. I and III only F. II and III only G. I, II, and III H. None of these

2. Temperature is a measure of the

A. average potential energy of the molecules of a substance
B. total potential energy of the molecules of a substance
C. average kinetic energy of the molecules of a substance
D. total kinetic energy of the molecules of a substance
E. average PE + KE of the molecules of a substance
F. total PE + KE of the molecules of a substance

**Consider two samples of gas: one of neon and one of helium. Each neon atom has about five times the mass of each helium atom. Both samples are at equal pressures.**

3. If the temperature of each sample is the same, which molecules have the greater average kinetic energy?

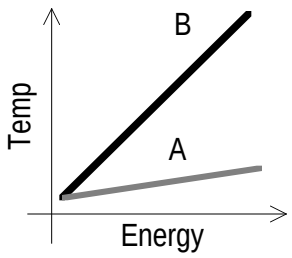
A. The neon molecules B. The helium molecules
C. Same for both D. Can't be determined from info given

4. A metal bar is cooled to –20°C and cut to 60.00cm. Its length when heated to 100°C is 60.08cm. The metal is most likely

A. Steel B. Silver C. Brass D. Aluminum E. Lead

**Two objects--A and B--are heated at equal rates. Their temp. vs. heat graphs are shown to the right.**

**For the statement(s) listed below, answer "Y" if the statement is a possible explanation and "N" if the statement is not a possible explanation.**




5. Objects A and B are made of the same material; object A has a greater mass than object B.

6. Objects A and B have the same mass; object B has a higher specific heat than object A.

**Specific Heat of Various Substances in J/kg·°C**
**Ag: 230 Al: 920 Au: 130 Cu: 390 Fe: 460 Pb: 130 $H_2O$: 4190 Glass: 840**

7. How much heat is needed to raise the temperature of 2kg of water from 20°C to 50°C?
   A. 357mJ B. 280J C. 8380J D. 126kJ E. 251kJ

8. For the greatest efficacy, a cold air vent should be placed in which part of a room?
   A. Near the floor B. Near the ceiling C. It makes no difference

9. A cookware manufacturer wishes to design a pan that will absorb radiant heat from a flame as rapidly and completely as possible. They would also like the cooking surface (interior) to remain as hot as possible (for maximum conduction to food). Which design should they adopt?

A. 
Silver interior and silver exterior

B. 
Black interior and black exterior

C. 
Black interior and silver exterior

D. 
Silver interior and black exterior

10. Jearl Walker's liquid nitrogen stunt doesn't result in massive damage to Jearl because
    I. The liquid nitrogen boils, forming a vapor layer between the liquid nitrogen and Jearl's tongue
    II. Heat conducts more rapidly through vapor than it does through liquid
    III. Jearl doesn't actually swallow the liquid nitrogen
    A. I only B. II only C. III only
    D. I and II only E. I and III only F. I, II, and III