4th Practice Exam

1. Which of the following produces radiation of the highest frequency?

    a. x-rays
    b. AM radio
    c. FM radio
    d. microwave oven
    e. radar

2. Planck suggested that all energy gained or lost by an atom must be some integral multiple of a minimum amount of energy called a(n)

    a. electron.
    b. spectrum.
    c. magnetic moment.
    d. quantum.
    e. orbital.

3. What name is given to a region of an electron probability density graph where the probability of finding the electron is zero?

    a. node
    b. wave function
    c. orbital
    d. lobe
    e. excited state

4. Which of the following electronic transitions in a hydrogen atom would have the longest wavelength?

    a. n = 4 to n = 1
    b. n = 4 to n = 2
    c. n = 2 to n = 1
    d. n = 4 to n = 3
    e. n = 1 to n = 0

5. The mathematic expression(s) which correctly give(s) the relationship(s) between the speed, wavelength, and frequency of electromagnetic radiation is (are):

    1. $\nu = c/\lambda$
    2. $c = \nu\lambda$
    3. $\lambda = c/\nu$

        a. 1 only
        b. 2 only
        c. 3 only
        d. 1 and 2 only
        e. 1, 2, and 3

6. A rifle bullet (mass = 1.50 g) is moving with a velocity of 7.00×10^2 mph. What is the wavelength associated with this bullet? ($h = 6.626 \times 10^{-34}$ kg m^2/s, 1000 m = 0.62137 miles)

    a. 1.41×10^{33} m
    b. 1.41×10^{-33} m
    c. 1.41×10^{-36} m
    d. 5.08×10^{-30} m
    e. 5.08×10^{-33} m

7. Which of the following best describes the energy change accompanying the process of breaking bonds in a molecule? (Ignore any subsequent reaction the may occur.)

    a. Always exothermic.
    b. Always endothermic.
    c. The net energy change is always zero.
    d. The change may be exothermic or endothermic depending on the physical state.
    e. The change may be exothermic or endothermic depending on the substances involved.

8. Consider 10.0 g Al, 10.0 g Cu and 10.0 g ethanol (C_2H_5OH). Which requires more energy for a 5.0 ºC temperature rise than does **1.0** gram of water?

Substance	Specific Heat (J/g K)
Ethanol (C_2H_5OH)	2.46
Water	4.184
Copper	0.385
Aluminum	0.902

a. 10.0 g Al

b. 10.0 g Cu

c. 10.0 g C_2H_5OH

d. both 10.0 g Al and 10.0 g C_2H_5OH

e. 10.0 g Al, 10.0 g Cu and 10.0 g C_2H_5OH