Multiple choice. Indicate the best answer.

1. A duck floating on a pond bobs up and down four times every 3 seconds as water waves pass. What is the frequency of the water waves?
   1. 4 Hz
   2. 3 sec
   3. 12 Hz
   4. 1.33 Hz
   5. 0.75 sec
2. In a transverse wave, the medium vibrates \_\_\_\_\_\_\_\_\_\_\_\_\_the direction of energy transmission.
   1. opposite to
   2. parallel to
   3. perpendicular to
   4. above
   5. below
3. Which type of wave results in circular motion of the medium?
   1. circular wave
   2. transverse wave
   3. surface wave
   4. longitudinal wave
   5. wave pulse

**Long Answer. Answer the following questions, showing all work.**

Identify the parts of the following wave:

**5)**

**4)**

**6)**

**7)**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. A submarine emits a sound pulse at 750 Hz that bounces off an enemy sub and returns 2.5 seconds after it is emitted. (Consider the speed of sound in water to be 1490 m/s)
   1. What is the wavelength (λ) of the sound waves?
   2. What is the period (T) of the sound waves?
6. The speed of light in air is 3.00 × 108 m/s. In glycerin, it is 2.04 × 108 m/s. A red laser, emitting light of frequency 4.3 × 1014 Hz is shone from the air into the glycerin.
   1. What is the wavelength of the red light in air?
   2. What is the wavelength of the red light in glycerin?