Name _____ Date _____

Honors Physics Reflection/Refraction WS#4

Period _____ Mrs. Nadworny

Index of Refraction

Directions: Read online textbook pages 562 – 565. Solve the following problems using the GUESS method and proper significant figures. Be sure to show ALL work.

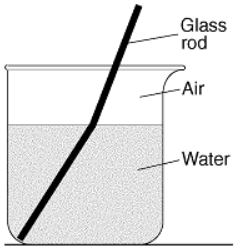
1. A beam of monochromatic light travels through crown glass, flint glass, Lucite and water. The speed of the light beam is slowest in

   (A) crown glass (B) flint glass (C) Lucite (D) water

2. As yellow light ($f = 5.09 \times 10^{14}$ Hz) travels from zircon to diamond, the speed of the light

   (A) increase (B) decrease (C) remains the same

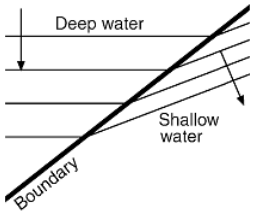
3. A straight glass rod appears to bend when placed in a beaker of water, as shown below.



   What is the best explanation for this phenomenon?

   (A) Light is refracted at the air-water interface
   (B) Light is reflected at the air-water interface
   (C) Light travels faster in water than in air.
   (D) The water is warmer than the air

4. The diagram below represents straight wave fronts passing from deep water into shallow water, with a change in speed and direction. Which phenomenon is illustrated in the diagram?



   (A) reflection (B) refraction (C) diffraction (D) interference

5. Which ray diagram best represents the phenomenon of refraction?

6. When light enters a new medium and is refracted, there must be a change in the light wave's

   (A) color (B) frequency (C) speed (D) period

Continued on the next page

7. Calculate the speed of light in Quartz.

8. Light travels at a speed of 1.56×10^8 m/s in an unknown medium. What could this material be?

9. A beam of monochromatic blue light whose frequency is 6.38×10^{14} Hz enters a block of sodium chloride from air.

    a. What is the frequency of the blue light in the block?

    b. Calculate the speed of light in the block.

    c. Calculate the wavelength of light in the block.

Answers in size order: 3.06×10^{-7}, 1.92, 1.95×10^8, 2.05×10^8, 6.38×10^{14}