Vasquez High School -- Physics -- Test #3 -- S' 2015 -- 70 points

Write TRUE if the statement is true OR write the word or words that substitute(s) for the underlined word or words that would make it true. Writing false only earns partial credit. Three points apiece.

_____ 1) <u>Coherent</u> light is light of only one wavelength.

_____ 2) A convex lens is also known as a <u>converging</u> lens.

_____ 3) <u>Refraction</u> is the bending of waves as they pass thru a small opening or around sharp corners.

_____ 4) When light rays pass from glass into water, the rays are bent more <u>toward</u> the normal.

_____ 5) Waves that are out of phase differ by <u>an odd number of wavelengths</u>.

Short Answer -- Fill-in. Be neat, clear and complete. If I cannot read it, you get bupkes. Three points.

6) How does the focal length of a convex lens differ from that of a concave lens? _____

_____.

7) LASER stands for _____.

8) Write the equation used to find the index of refraction for a material given their incident and refracted

angles: _____

9) Will a double slit experiment yield the same results for red light as it would for blue light? Why or why not?

_____

_____.

10) Give two expressions for the optical magnification of an object: _____ and _____.

11) <u>Short Essay</u>. Write 3-5 sentences to explain how a laser works. Five points.

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12) Your friend shows you her new engagement ring, a beautiful diamond. You suspect that her fiancé has cheaped out on her and bought her something less than a real diamond. You know that diamond has an index of refraction of 2.42, so you shine a laser into it at an angle of 65° to the normal. The ray comes out at angle of about 22°. Is it a diamond? You have to prove your conclusion?

13) An arrangement of three 1" transparent plastics with indices of refraction 1.35, 1.45 and 1.6 are sandwiched together and submerged in salt water (n = 1.36). A beam of light enters the first plastic from the salt water at an angle of 55° with respect to the normal. What is the angle of refraction after the light enters the thrid plastic slab?

14) The width of a human beard hair is about 0.23 mm. Imagine a double slit apparatus with a separation equal to the width of a beard hair. What wavelength would produce a third-order maximum at an angle of 2.1° ?

15) The critical angle for a new type of optical fiber is 46.3°. Its index of refraction is what?

16) Where must an object be placed to form an inverted image 25 cm away on the far side of a converging lens if its focal length is 18 cm? What will its magnification be?