Physics 47 – Optics

Name: SOLUTIONS

Quiz 2

(Circle the correct answer. Each question worth 1 pt)

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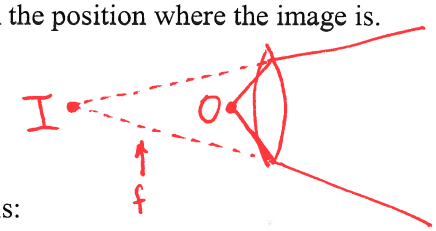
1. The Fresnel Equations: **I**) are a consequence of Maxwell's Equations; **II**) imply a ~~90°~~ 180° phase shift when light in vacuum with $\vec{E}$ perpendicular to the plane of incidence reflects from a surface; **III**) imply that polarization can be achieved by reflection.
   a. Only I is true
   b. Only I and III are true
   c. Only II and III are true
   d. I, II, and III are all true

2. Total internal reflection can occur:
   a. Only when the incident medium (n_i) is less dense than the transmitting medium (n_t).
   b. Only when the incident medium (n_i) is more dense than the transmitting medium (n_t).
   c. Only when the media are of approximately equal density.
   d. Irrespective of the density of the media.

3. An expression for the absolute index of refraction is:
   a. v/c
   b. $c/\sqrt{\epsilon\mu}$
   c. $c\sqrt{\epsilon\mu}$
   d. $\sqrt{\epsilon_0\mu_0/\epsilon\mu}$

$n = \frac{c}{v}$, $v = \frac{1}{\sqrt{\epsilon\mu}}$

4. Virtual images are so called because:
   a. Light rays that form the image only *appear* to come from the position where the image is.
   b. The image is too small to be seen with the naked eye.
   c. The image can only be projected onto a screen.
   d. The image is located behind the lens or mirror.



5. The radius of curvature of a convex mirror of focal length -8 cm is:
   a. -4 cm
   b. 16 cm
   c. 4 cm
   d. -16 cm

$f = \frac{-R}{2}$

6. For a converging lens, a collimated light ray refracts to what position on the optical axis ($y = 0$)?
   a. To the position of the image, s_i
   b. To the backside focal length, f
   c. To the frontside center of curvature, C_1
   d. To the center of the lens.