

PHYS 2135

Total

End Material Test
May 14, 2019

Name: _____

Recitation: _____

Do not open the test until instructed to do so by the test proctors. When instructed to open the test, remove only the cover sheet and starting equations from the test.

Write clearly on this page the answer you believe is the best or most nearly correct answer. You may also record the answers on your starting equation sheet for later comparison with the answer key, which will be posted after all students have taken the test. When you finish both the End Material Test and the Final Exam, turn both in to the test proctor with all pages, including this page, stapled together. You may keep the starting equation sheets or leave them with the test proctor to be recycled.

Calculators are NOT allowed!

Each question is worth 6 points, except question 8, which is worth 8 points.

Your Answers:

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

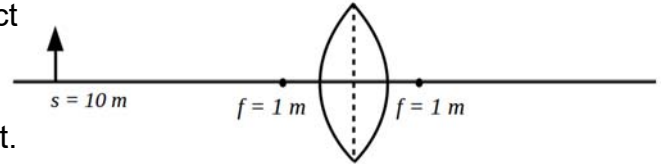
8. _____

End Material Test

1. Light of wavelength 640 nm in air is incident on a slab of polycarbonate ($n_{\text{polycarbonate}} = 1.6$). What is the wavelength of the light in the polycarbonate?
[A] 200nm
[B] 400nm
[C] 600nm
[D] 800nm
2. Light traveling in air ($n = 1$) is incident on the surface of a pool of water. What is the maximum angle of incidence that will result in total reflection of the light back into the air?
[A] 0°
[B] 48.75°
[C] 80°
[D] no matter what the angle of incidence, total reflection will not take place.
3. The image formed by a plane mirror is
[A] Real and upright
[B] Real and inverted
[C] Virtual and upright
[D] Virtual and inverted.
4. A convex mirror of radius R has a
[A] focal length that depends on object height
[B] negative focal length
[C] focal length equal to R
[D] all of the above.

5. An upright object is placed at a distance $s = 10\text{m}$ from a converging lens of focal length $f = 1\text{m}$, as shown. The image is

- [A] virtual, upright, and smaller than the object
 [B] virtual, inverted, and larger than the object
 [C] real, upright, and larger than the object
 [D] real, inverted, and smaller than the object.

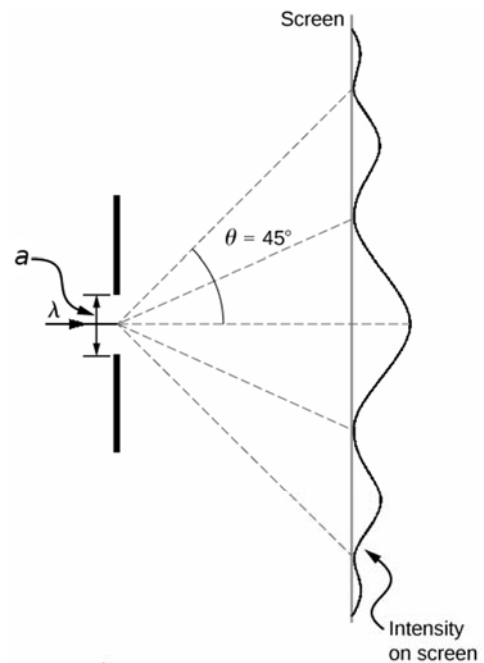


6. Coherent light passing through two slits produces a pattern of dark and bright fringes on a distant screen. If you increase the separation between the slits:

- [A] the distance between the bright fringes decreases
 [B] the distance between the bright fringes increases
 [C] the wavelength of the light decreases
 [D] the wavelength of the light increases.

7. Visible light of wavelength $\lambda = 550\text{nm}$ falls on a single slit and produces its second diffraction minimum at an angle of 45.0° relative to the incident direction of the light, as in the figure. What is the width of the slit?

- [A] 1.56nm
 [B] $1.56\mu\text{m}$
 [C] 1.56m
 [D] 1.56km



8. (Free question) If a pair of ferrets attempted to simultaneously run through a single slit

- [A] they would destructively interfere with each other.
 [B] their potential would decrease.
 [C] their energy would increase.
 [D] they would be out of phase all day.

