



browntr19@students.ecu.edu
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[←](#) **PHYS 1260, section 001, Fall 2020**

INSTRUCTOR

Joel DeWitt
East Carolina University

Chapter 26 (Homework)

Current Score

QUESTION

1

2

3

4

5

6

7

8

POINTS

-/1

-/1

-/1

-/1

-/1

-/2

-/2

-/1

TOTAL SCORE

-/10

0.0%

Due Date

THU, NOV 12, 2020

11:59 PM EST



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Description



Assignment Submission & Scoring

Assignment Submission

For this assignment, you submit answers by question parts. The

number of submissions remaining for each question part only changes if you submit or change the answer.

Assignment Scoring

Your last submission is used for your score.

1. [-/1 Points]

DETAILS

COLFUNPHYS1 26.P.004.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

The coherence length of an ordinary white light source can be increased if we place a color filter in front of the source, so that the light that passes through the filter is somewhat monochromatic. The minimum wavelength of the emerging light is 618 nm. What is the maximum wavelength in order for the coherence length to be 0.09900 mm?

2. [-/1 Points]

DETAILS

COLFUNPHYS1 26.P.007.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

Two thin slits separated by 0.16 mm are illuminated by a monochromatic plane wave, producing interference fringes on a distant screen. If the angle between adjacent fringes is 3.4×10^{-3} rad, what is the color of the fringes?

- ☐ violet
- ☐ blue
- ☐ green
- ☐ yellow
- ☐ orange
- ☐ red

3. [-/1 Points]

DETAILS

COLFUNPHYS1 26.P.008.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

Blue interference fringes are formed on a screen 1.9 m away from a double slit illuminated by monochromatic light of wavelength 476 nm. The distance between the centers of adjacent fringes is 4.5 mm. Find the separation between the two slits.

4. [-/1 Points]

DETAILS

COLFUNPHYS1 26.P.009.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

Two narrow slits separated by 0.37 mm are illuminated by monochromatic light of wavelength 529 nm. How many bright fringes can be seen on a screen 1.2 cm wide placed 1.2 m in front of the slits?

5. [-/1 Points]

DETAILS

COLFUNPHYS1 26.P.010.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

How far is the second dark fringe to the right of the central bright fringe in the double-slit interference pattern seen on a screen 2 m from the slits? The slits are separated by 0.4 mm and are illuminated by monochromatic light of wavelength 624 nm.

6. [-/2 Points]

DETAILS

COLFUNPHYS1 26.P.015.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

A layer of oil, with a refractive index of 1.40798 , 0.99506 mm thick, floats on water.

(a) Light of vacuum wavelength 632.800 nm, emitted by a stabilized He-Ne laser, is reflected at normal incidence by the oil. How many wavelengths are contained in the light wave passing back and forth through the oil?

(b) Does the light reflected from the two surfaces of the oil interfere constructively or destructively?

☐ constructive interference

☐ destructive interference

7. [-/2 Points]

DETAILS

COLFUNPHYS1 26.P.023.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

Consider the following.

(a) Find the angle θ locating the first minimum in the Fraunhofer diffraction pattern of a single slit of width **0.202** mm, using light of wavelength **417** nm.

(b) Find the angle locating the second minimum.

8. [-/1 Points]

DETAILS

COLFUNPHYS1 26.P.025.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

A Fraunhofer diffraction pattern of a single slit of width **0.331** mm is produced using light of wavelength **618** nm. Find the angle subtended by the central diffraction maximum.

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