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INSTRUCTOR

Joel DeWitt
East Carolina University

Exam 4 (1260) (Test)

Current Score					Due Date				
QUESTION					THU, NOV 12, 2020 1:15 PM EST				
1 2 3 4 5 6 7 8 9 10					Request Extension				
i 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.

DETAILS

COLFUNPHYS1 26.P.007.

MY NOTES

ASK YOUR TEACHER

Two thin slits separated by 0.19 mm are illuminated by a monochromatic plane wave, producing interference fringes on a distant screen. If the angle between adjacent fringes is 3.3×10^{-3} rad, what is the color of the fringes?

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

2.

DETAILS

COLFUNPHYS1 27.P.008.

MY NOTES

ASK YOUR TEACHER

An astronaut with a steady heartbeat of 61 beats per minute travels at a constant speed of $0.73c$, relative to earth. During the voyage his heart beats 5.1×10^6 times. From the earth's reference frame, how many times did the astronaut's heart beat?

From the earth's reference frame, what was the heart rate?

beats/min

3.

DETAILS

COLFUNPHYS1 27.P.014.

MY NOTES

ASK YOUR TEACHER

How far from the earth would you be able to travel in a lifetime of 78 years if you were able to travel at a constant speed of $0.77c$?

4.

DETAILS

COLFUNPHYS1 27.P.023.

MY NOTES

ASK YOUR TEACHER

The starship *Enterprise* is fleeing from a pursuing Klingon spaceship at a speed of $0.730c$ relative to the other ship. The *Enterprise* fires a laser pulse as well as a rocket back at the pursuing Klingons. The speed of the rocket, relative to the *Enterprise*, is $0.206c$. Find the velocity of the laser pulse as seen by the Klingons.

magnitude cdirection

Find the velocity of the rocket as seen by the Klingons.

magnitude cdirection

5.

DETAILS

COLFUNPHYS1 27.P.032.

MY NOTES

ASK YOUR TEACHER

Suppose you had as your personal energy source a quantity of matter and antimatter, which, when brought together, annihilated itself, that is, completely converted to radiant energy. What mass of fuel would be required in a lifetime of 79.6 years to provide power at a steady rate of 1.05 kW?

6.

DETAILS

COLFUNPHYS1 29.P.002.

MY NOTES

ASK YOUR TEACHER

Calculate the shortest wavelength of light emitted by the hydrogen atom.

7.

DETAILS

COLFUNPHYS1 30.P.004.

MY NOTES

ASK YOUR TEACHER

How do you represent symbolically the **nitrogen** isotope that has a mass number of **14**? Nitrogen has an atomic number of **7**.

8. **DETAILS** **COLFUNPHYS1 30.P.008.**

MY NOTES

ASK YOUR TEACHER

Find the binding energy and the binding energy per nucleon of the $^{207}_{82}\text{Pb}$ nucleus.

binding energy

binding energy per nucleon

9. **DETAILS** **COLFUNPHYS1 30.P.025.**

MY NOTES

ASK YOUR TEACHER

Find the decay constant of $^{222}_{86}\text{Rn}$, which has a half-life of **3.824** days.

10. **DETAILS** **COLFUNPHYS1 30.P.028.**

MY NOTES

ASK YOUR TEACHER

If a rock containing U-238 initially reads **84.4** counts per minute on a Geiger counter, what will its reading be **8** weeks later?

counts per minute

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