Final Review T/F Questions

Yay, physics!

Black font: setup of problem.

Green font: statement that you determine is T/F.

Physics 2C, Spring 2025

REMINDER OF UNITS / TOPICS

Exam 1: Fluids

Exam 2: Mechanical Waves

Exam 3: Thermodynamics

Exam 4: EM Waves; Wave Optics

Exam 5: Geometric Optics

As you go through each of the following questions, you should have an idea of what Unit/Exam (or chapters in the textbook) they relate to, and what are the relevant formulae.

Clicker T/F… A: TRUE, B: FALSE

A piece of metal is sitting on top of an ice cube so that the ice cube and metal are barely floating. If the ice melts and the metal sinks, the water level will drop.

Clicker T/F… A: TRUE, B: FALSE

A transverse wave is moving in the –x direction. A snapshot at t = 0 looks like a “positive sin wave” (i.e., $D(x,0) = A\sin(kx)$, with A>0). If you were to look at a history graph of the wave at $x = 0$, it would also look like a “positive sin wave.”

Clicker T/F… A: TRUE, B: FALSE

For a moving observer moving at a half the speed of sound towards a stationary source, the observed frequency is exactly twice the emitted frequency.

Clicker T/F… A: TRUE, B: FALSE

20 guitar players play their guitars at the same time. Assuming the sound intensity due to one guitar is 80 dB, then the intensity due to all twenty is about 100 dB.

Clicker T/F… A: TRUE, B: FALSE

An open-closed pipe resonating at its fundamental frequency produces sound waves. If, instead, we wanted to use an open-open pipe to produce the same frequency, then the pipe would have to be twice as long.

Clicker T/F… A: TRUE, B: FALSE

If the sun’s power doubled, the equlibrium temperature of the earth would roughly increase by a factor of 16 (not including effects of greenhouse gasses, etc.).

Clicker T/F… A: TRUE, B: FALSE

A refrigerator has a coefficient of performance 4. This means that, for every 400 J of heat extracted from the fridge, 500 J is delivered to the room as waste heat.

Clicker T/F… A: TRUE, B: FALSE

For water [latent heat of fusion 334 kJ/kg, specific heat 4184 J/(kg K)], the heat it takes to melt an ice cube is more than the heat required to bring the resulting water from 0^0C to 50^0C.

Clicker T/F… A: TRUE, B: FALSE

If you give an isolated gas an amount of heat Q and hold the volume constant, then its temperature rises by an amount ΔT .
Given this information, then if you give the same gas an additional amount of heat Q at constant pressure, then the temperature will rise by an amount less than ΔT.

Clicker T/F… A: TRUE, B: FALSE

Equal numbers of Argon and Oxygen molecules are in a container at the same temperature. The Oxygen has more translational KE than the Argon.

Clicker T/F… A: TRUE, B: FALSE

An EM wave in air is incident on an air-water interface. When passing through to the water, the wavelength of the wave increases and the frequency remains the same.

Clicker T/F… A: TRUE, B: FALSE

When a lens is used as a magnifying glass, the image observed is virtual and the lens used is convex.

Clicker T/F… A: TRUE, B: FALSE

Light from a 542 nm laser will have more dark fringes per centimeter than light from a 680 nm laser if both beams are passed through the same 2-slit system and the interference pattern displayed on the same screen.

Clicker T/F… A: TRUE, B: FALSE

If a photographer decreases the aperture diameter, keeping the focal length and shutter time constant, then the resulting photographs will be dimmer.

Clicker T/F… A: TRUE, B: FALSE

A myopic person, using corrective lenses appropriate to correct for their nearsightedness, will see images that are slightly magnified (“bigger”) relative to the usual object size.

Clicker T/F… A: TRUE, B: FALSE

Suppose an object is 20cm from a lens, forming a real image 40cm from the lens. If the object is moved 1.0% closer to the lens, then the image will move approximately 2.0% away from the lens.

Clicker T/F… A: TRUE, B: FALSE

Unpolarized light passes through 4 polarizers, each one 30.0^0 relative to the previous one. The final intensity of the light is less than 5.0% of the initial intensity of the light.

Clicker T/F… A: TRUE, B: FALSE

If the electric field at a certain location in space and time is pointing in the +y direction, and if the wave is moving in the +z direction, then the magnetic field at that same location in space and time is pointing in the +x direction.