

Chapter 31 Test Diffraction and Interference

True or False Questions*Circle the correct answer.*

- T** **F** 1. Huygens' principle is useful in explaining how waves propagate, but it can't explain reflection and refraction.
- T** **F** 2. Two stereo speakers can be set side by side so there are some places in front of them where sound is very diminished.
- T** **F** 3. Sometimes patches of color from gasoline floating on water looks blue. This is because blue light reflects from and interferes destructively with both the water and the gasoline.
- T** **F** 4. Within a laser, a light wave emitted from one atom stimulates the emission of light from a neighboring atom so that the crests of each wave coincide.
- T** **F** 5. The laser is a source of energy.

Multiple Choice Questions*Choose the best answer to each question and write the appropriate letter in the space provided.*

- _____ 6. When plane waves pass through an opening, the wave fronts will not change much if the opening is
- wide compared to the wavelength.
 - narrow compared to the wavelength.
 - the same size as the wavelength.
- _____ 7. Diffraction occurs only for
- radio waves.
 - light.
 - X-rays.
 - Nonsense. Diffraction can occur for any wave.
- _____ 8. Constructive interference occurs when
- two waves of the same color overlap.
 - the crests of two waves overlap.
 - the crest of one wave meets the trough of another wave.
 - all of the above
- _____ 9. Destructive interference occurs when
- two waves of the same color overlap.
 - the crests of two waves overlap.
 - the crest of one wave meets the trough of another wave.
 - all of the above
- _____ 10. Monochromatic light refers to light that is
- white.
 - red.
 - a chrome color.
 - one color.

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- _____ 11. When monochromatic light shines through two closely spaced narrow slits and onto a screen some distance away, the pattern on the screen has
- no light in it.
 - alternating dark and light bands.
 - one large bright spot.
 - two large bright spots.
- _____ 12. Which of these colors would NOT be seen in interference colors of gasoline on a wet street?
- red
 - magenta
 - yellow
 - cyan
- _____ 13. Coherent light is many different rays of light all having the same
- frequency.
 - phase.
 - wavelength.
 - all of the above
- _____ 14. Light emitted by a laser is
- coherent.
 - incoherent.
- _____ 15. A hologram best illustrates
- iridescence.
 - diffraction.
 - incoherent light.
 - internal reflection.

Essay Question

On a separate sheet of paper, answer the following question.

16. What are the two types of interference, and under what conditions do they occur? Give examples.