

Directions: Choose only the best answer to each question! Do not write on the multiple choice section.

Multiple Choice Section:

- 1) The wave theory of light is attributed to
 - A) Christian Huygens.
 - B) Isaac Newton.
 - C) Max Planck.
 - D) Albert Einstein.

- 2) The particle theory of light is attributed to
 - A) Christian Huygens.
 - B) Isaac Newton.
 - C) Max Planck.
 - D) Albert Einstein.

- 3) White light is
 - A) light of wavelength 550 nm, in the middle of the visible spectrum.
 - B) a mixture of all frequencies.
 - C) a mixture of red, green, and blue light.
 - D) the term used to describe very bright light.
 - E) the opposite (or complementary color) of black light.

- 4) What principle is responsible for alternating light and dark bands when light passes through two or more narrow slits?
 - A) refraction
 - B) polarization
 - C) dispersion
 - D) interference

- 5) At the second maxima on either side of the central bright spot in a double-slit experiment, light from
 - A) each opening travels the same distance.
 - B) one opening travels twice as far as light from the other opening.
 - C) one opening travels one wavelength of light farther than light from the other opening.
 - D) one opening travels two wavelengths of light farther than light from the other opening.

- 6) In a Young's double slit experiment, if the separation between the slits decreases, what happens to the distance between the interference fringes?
 - A) It decreases.
 - B) It increases.
 - C) It remains the same.
 - D) There is not enough information to determine.

- 7) Light of wavelength 550 nm in air is found to travel at 1.96×10^8 m/s in a certain liquid. Determine the wavelength of the light in the liquid.
 - A) 550 nm
 - B) 359 nm
 - C) 281 nm
 - D) 303 nm

8) Two thin slits are $6.00 \mu\text{m}$ apart. Monochromatic light falls on these slits, and produces a fifth order interference fringe at an angle of 32.3° . What is the wavelength of the light?

- A) 164 nm
- B) 416 nm
- C) 614 nm
- D) 641 nm

9) A single slit, which is 0.050 mm wide, is illuminated by light of 550 nm wavelength. What is the angular separation between the first two minima on either side of the central maximum?

- A) 0.36°
- B) 0.47°
- C) 0.54°
- D) 0.63°
- E) 1.26°

10) In a diffraction experiment, light of 600 nm wavelength produces a first-order maximum 0.350 mm from the central maximum on a distant screen. A second monochromatic source produces a third-order maximum 0.870 mm from the central maximum when it passes through the same diffraction grating. What is the wavelength of the light from the second source?

- A) 479 nm
- B) 497 nm
- C) 749 nm
- D) 794 nm

DIRECTIONS: Place your answer to the Multiple Choice Questions in the section below!
Compare this with the answer key to this PreTest.

- _____ 1.
- _____ 2.
- _____ 3.
- _____ 4.
- _____ 5.
- _____ 6.
- _____ 7.
- _____ 8.
- _____ 9.
- _____ 10.

4. In a double-slit experiment it is found that blue light of wavelength 460 nm gives a second-order maximum at a certain location on the screen. What wavelength of visible light would have a minimum at the same location?
5. What is the separation between two slits for which 610-nm orange light has its first maximum at an angle of 30.0° ?