S C I E N C E T E S T

NAME _____ DATE _____

SCORE _____ PERIOD _____

You have to decide which one of the suggested answers is correct. Indicate your choice on the answer sheet. Please do not make any marks on this paper.

1- When observed from Earth, the wavelengths of light emitted by a star are shifted toward the red end of the electromagnetic spectrum. This redshift occurs because the star is

(1) at rest relative to Earth
(2) moving away from Earth
(3) moving toward Earth at decreasing speed
(4) moving toward Earth at increasing speed

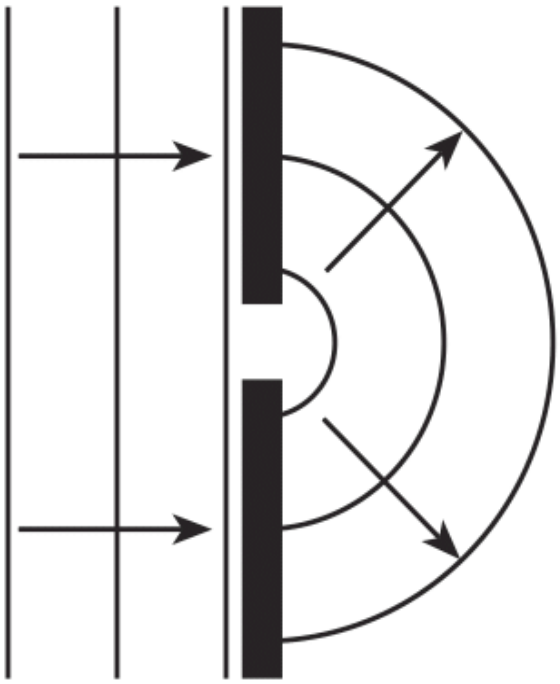
2- An astronomer on Earth studying light coming from a star notes that the observed light frequencies are lower than the actual emitted frequencies. The astronomer concludes that the distance between the star and Earth is

(1) decreasing
(2) increasing
(3) unchanging

3- Which wave phenomenon makes it possible for a player to hear the sound from a referee's whistle in an open field even when standing behind the referee?

(1) diffraction
(2) Doppler effect
(3) reflection
(4) refraction

4- The diagram below shows straight wave fronts passing through an opening in a barrier.



This wave phenomenon is called

(1) reflection
(2) refraction
(3) polarizaton
(4) diffraction

5- A periodic wave transfers

(1) energy, only
(2) mass, only
(3) both energy and mass
(4) neither energy nor mass

6- Which pair of terms best describes light waves traveling from the Sun to Earth?

(1) electromagnetic and transverse
(2) electromagnetic and longitudinal
(3) mechanical and transverse
(4) mechanical and longitudinal

7- Waves pass through a 10.-centimeter opening in a barrier without being diffracted. This observation provides evidence that the wavelength of the waves is

(1) much shorter than 10. cm
(2) equal to 10. cm
(3) longer than 10. cm, but shorter than 20. cm
(4) longer than 20. cm

Base your answers to questions **8** and **9** on the information below.

A 2.00×10^6-hertz radio signal is sent a distance of 7.30×10^{10} meters from Earth to a spaceship orbiting Mars.

8- Approximately how much time does it take the radio signal to travel from Earth to the spaceship?

(1) 4.11×10^{-3} s
(2) 2.43×10^{2} s
(3) 2.19×10^{8} s
(4) 1.46×10^{17} s

Note that question 9 has only three choices.

9- The spaceship is moving away from Earth when the radio signal is received. Compared to the frequency of the signal sent from Earth, the frequency of the signal received by the spaceship is

(1) lower
(2) higher
(3) the same

10- Two waves having the same amplitude and frequency are traveling in the same medium. Maximum destructive interference will occur when the phase difference between the waves is

(1) 0°
(2) 90°
(3) 180°
(4) 270°

This exam was created with information from the New York State Department of Education, and the NY Regents Physics Exams. It includes selected questions from many exams that were given before the year 2020. The website link is: https://www.nysedregents.org/physics/

The exam was put together by Ceres-Science, to help physics students become better problem solvers.

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