

Brett Robbins Academic Consulting

Physics 20 Practice Test

Unit D: Oscillatory Motion & Mechanical Waves

10 Questions

Original practice questions written to the Alberta curriculum, in the style of past diploma examinations. Work through each question, then check your answers with the key at the end.

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, contact Brett for clarification.

Question 1

In simple harmonic motion, the restoring force acting on an oscillating object is always directed

- A) away from the equilibrium position
- B) toward the equilibrium position
- C) in the direction of the object velocity
- D) perpendicular to the direction of motion

Question 2

A pendulum swings back and forth with a period of 0.50 s.

The frequency of the pendulum is

- | | |
|------------|------------|
| A) 0.50 Hz | B) 5.0 Hz |
| C) 2.0 Hz | D) 0.20 Hz |

Question 3

The period of a simple pendulum depends on

- A) the length of the pendulum and the gravitational field strength
- B) the mass of the bob and the length of the pendulum
- C) the mass of the bob and the amplitude of the swing
- D) the amplitude of the swing and the length of the pendulum

Question 4

A wave travelling along a rope has a frequency of 5.0 Hz and a wavelength of 0.40 m.

Using $v = f\lambda$, the speed of the wave, to the nearest tenth, is ____ m/s.

Question 5

In a transverse wave, the particles of the medium vibrate

- A) parallel to the direction of wave travel
- B) in large circles around the equilibrium position
- C) not at all once the wave has passed
- D) perpendicular to the direction of wave travel

Question 6

A 0.20 kg mass attached to a spring oscillates on a frictionless horizontal surface.

The spring constant is 50 N/m. Using $T = 2\pi\sqrt{\frac{m}{k}}$, the period of oscillation is

- A) 0.40 s
- B) 0.63 s
- C) 1.6 s
- D) 2.5 s

Question 7

A simple pendulum has a length of 0.25 m.

Using $T = 2\pi\sqrt{\frac{L}{g}}$ with $g = 9.81 \text{ m/s}^2$, its period, to the nearest tenth, is ____ s.

Question 8

When a force of 12 N is applied to a spring, the spring stretches by 0.30 m.

The spring constant is

- A) 3.6 N/m
- B) 0.025 N/m
- C) 40 N/m
- D) 360 N/m

Question 9

An air column that is closed at one end can support standing waves with frequencies that are

- A) all whole-number multiples of the fundamental frequency
- B) only odd multiples of the fundamental frequency
- C) only even multiples of the fundamental frequency
- D) only the fundamental frequency itself

Question 10

A stretched string 0.80 m long supports waves that travel at 320 m/s.

The frequency of the third harmonic of the string is ____ Hz.

Answer Key

- | | | |
|--------|--------|---------|
| 1. B | 5. D | 9. B |
| 2. C | 6. A | 10. 600 |
| 3. A | 7. 1.0 | |
| 4. 2.0 | 8. C | |

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