

Simple Harmonic Motion (SHM) – Worksheet

Name: __ Class/Section: __ Date: __

Instructions:

1. Complete all sections carefully.
 2. Show all working for numerical questions.
 3. Tick, match, or write answers in the spaces provided.
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Section 1: Definitions (Fill in the blanks)

1. The central point where the object rests is called __
 2. The maximum distance the object moves from equilibrium is called __
 3. The motion that repeats itself over time is called __
 4. The force that brings the object back toward equilibrium is called __
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Section 2: Multiple Choice

1. Which of the following is an example of SHM?
 2. A ball rolling down a hill
 3. A pendulum swinging
 4. A car moving on a straight road
 5. Water flowing in a river
 6. What happens to the time period if the mass of a mass-spring system increases?
 7. Decreases
 8. Increases
 9. Stays the same
 10. Which statement is correct?
 11. Amplitude affects the period of SHM
 12. Time period depends only on mass (for spring) or length (for pendulum)
 13. Restoring force is away from equilibrium
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Section 3: Matching

Match the term with its correct description:

Term	Description
Amplitude	_____
Equilibrium	_____
Oscillation	_____
Restoring Force	_____

Section 4: Numerical Questions

1. Mass-Spring System: A mass of 0.5 kg is attached to a spring with spring constant 200 N/m. Find:
2. Time period $T = 2\pi\sqrt{(m/k)} = \underline{\hspace{2cm}}$
3. Frequency $f = 1/T = \underline{\hspace{2cm}}$
4. Simple Pendulum: A pendulum has a length of 1.5 m. Find:
5. Time period $T = 2\pi\sqrt{(L/g)} = \underline{\hspace{2cm}}$
6. Frequency $f = 1/T = \underline{\hspace{2cm}}$

Section 5: Diagram Activity

Instructions: Label the diagram of a mass-spring system: - Amplitude - Equilibrium - Maximum displacement

(Draw the diagram in the space below or attach an image if digital.)

Section 6: Concept Questions

1. Why does SHM repeat itself?
2. What happens to the frequency if the length of a pendulum is quadrupled?
3. Does amplitude affect the time period? Explain.

Optional Formula Reference:

$$T = 2\pi\sqrt{(m/k)}, T = 2\pi\sqrt{(L/g)}, f = 1/T$$