

- 2 (a) Define simple harmonic motion (s.h.m.).

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.....[2]

- (b) A trolley of mass 700 g oscillates between two stands as shown in Fig. 2.1. As the trolley moves from right to left, it pulls the ticker tape for half a cycle. The timer marks 50 dots per second.

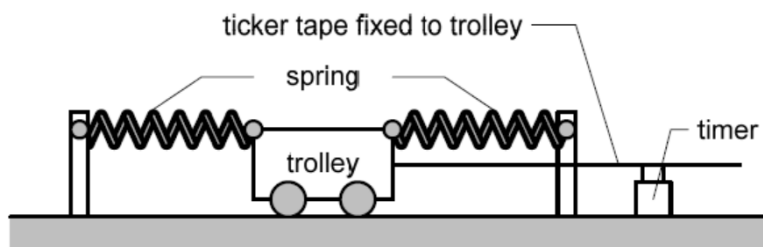


Fig. 2.1

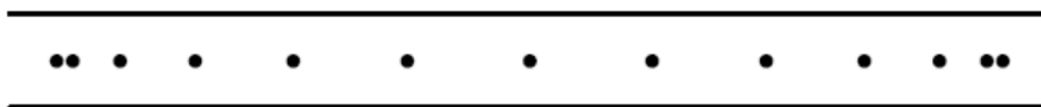


Fig. 2.2 (drawn to scale)

The ticker tape in Fig. 2.2 is drawn to full scale. By making appropriate measurements,

- (i) show that the period of oscillation is 0.48 s.

[1]

(ii) determine the amplitude of the oscillation,

amplitude = cm [1]

(c) Hence, calculate

(i) the maximum velocity of the trolley,

maximum velocity = cm s^{-1} [1]

(ii) the maximum resultant force acting on the trolley,

maximum resultant force = N [2]

- (d) Sketch in Fig. 2.3 the graph of velocity against displacement for the half-cycle that that ticker tape was pulled through, taking leftward to be the positive direction.

Indicate the starting point on your sketch. There is no need to indicate values.

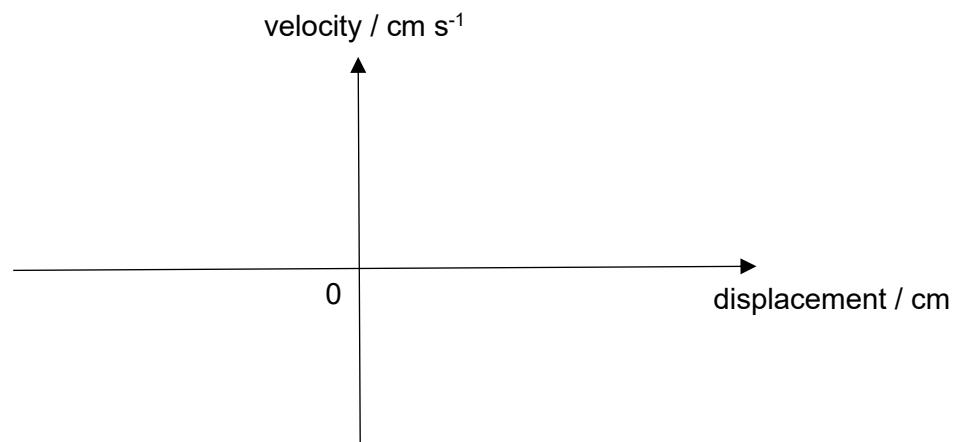


Fig. 2.3

[2]

