

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

[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.

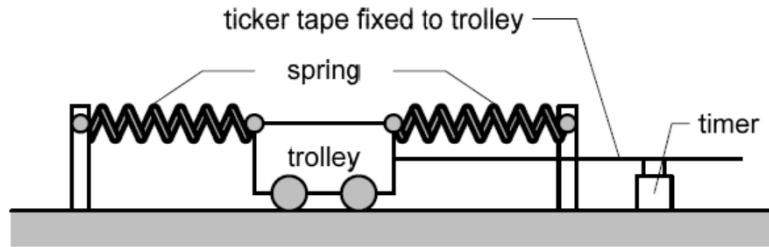


Fig. 2.1

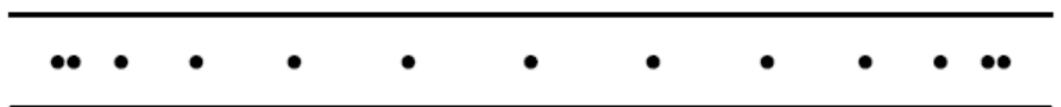


Fig. 2.2 (drawn to scale)

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,

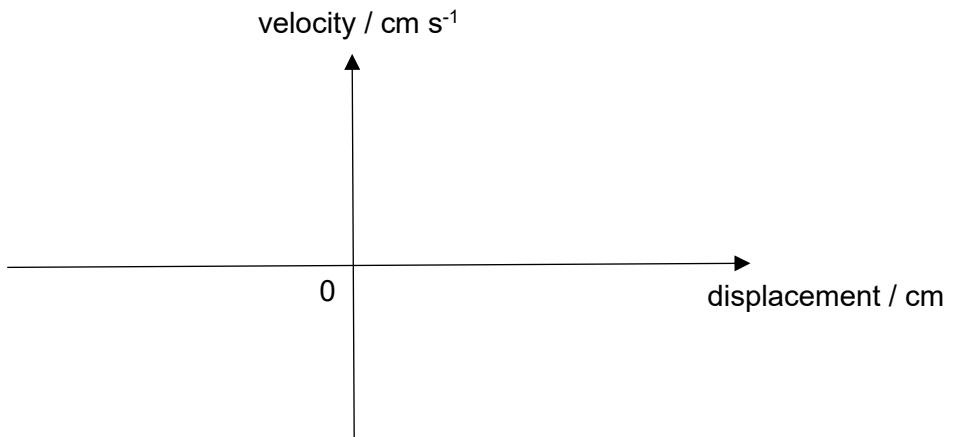
$$\text{maximum velocity} = \dots \text{ cm s}^{-1} [1]$$

(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]

