

- 5 A horizontal string is stretched between two fixed points A and B. A vibrator is used to oscillate the string and produce an observable stationary wave.

At one instant, the moving string is straight, as shown in Fig. 5.1.



**Fig. 5.1**

The dots in the diagram represent the positions of the nodes on the string. Point P on the string is moving downwards.

The wave on the string has a speed of  $35 \text{ m s}^{-1}$  and a period of 0.040 s.

- (a) Explain how the stationary wave is formed on the string.

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.....  
..... [2]

- (b) On Fig. 5.1, sketch a line to show a possible position of the string a quarter of a cycle later than the position shown in the diagram. [1]

- (c) Determine the horizontal distance from A to B.

$$\text{distance} = \dots \text{ m} [3]$$

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- (d) A particle on the string has zero displacement at time  $t = 0$ . From time  $t = 0$  to time  $t = 0.060\text{ s}$ , the particle moves through a total distance of  $72\text{ mm}$ .

Calculate the amplitude of oscillation of the particle.

amplitude = ..... mm [2]