

- 5 Fig. 5.1 shows a string stretched between two fixed points P and Q.

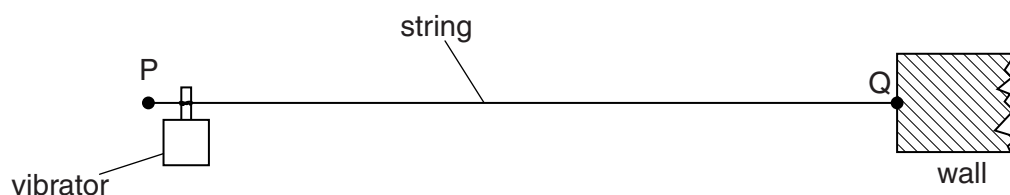


Fig. 5.1

A vibrator is attached near end P of the string. End Q is fixed to a wall. The vibrator has a frequency of 50 Hz and causes a transverse wave to travel along the string at a speed of 40 ms^{-1} .

- (a) (i) Calculate the wavelength of the transverse wave on the string.

wavelength = m [2]

- (ii) Explain how this arrangement may produce a stationary wave on the string.

.....

 [2]

- (b) The stationary wave produced on PQ at one instant of time t is shown on Fig. 5.2. Each point on the string is at its maximum displacement.

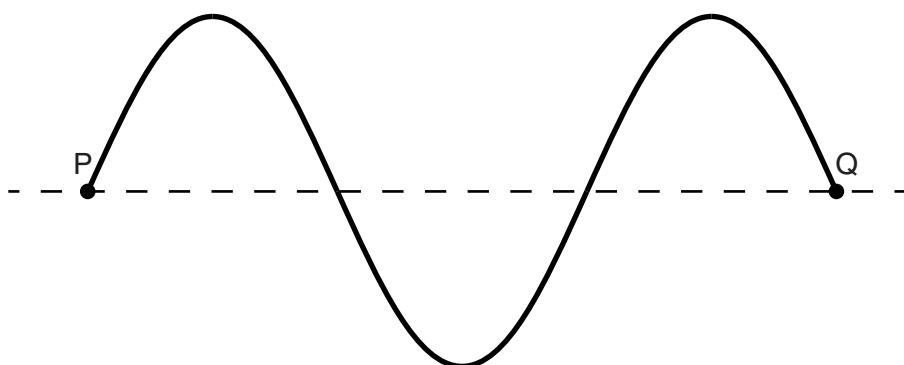


Fig. 5.2 (not to scale)

- (i) On Fig. 5.2, label all the nodes with the letter **N** and all the antinodes with the letter **A**. [2]

(ii) your answer in (a)(i) to calculate the length of string PQ.

length = m [1]

(iii) On Fig. 5.2, draw the stationary wave at time $(t + 5.0 \text{ ms})$. Explain your answer.

..... [3]