5 A uniform string is held between a fixed point P and a variable-frequency oscillator, as shown in Fig. 5.1.

For Examiner's Use

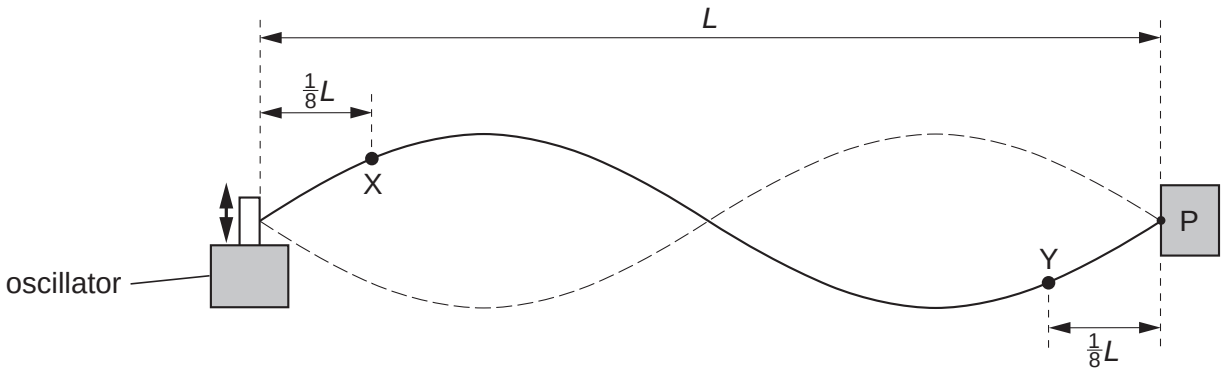

Fig. 5.1

The distance between point P and the oscillator is L.

The frequency of the oscillator is adjusted so that the stationary wave shown in Fig. 5.1 is formed.

Points X and Y are two points on the string.

Point X is a distance $\frac{1}{8}L$ from the end of the string attached to the oscillator. It vibrates with frequency f and amplitude A.

Point Y is a distance $\frac{1}{8}L$ from the end P of the string.

(a) For the vibrations of point Y, state

(i) the frequency (in terms of f),

frequency = ... [1]

(ii) the amplitude (in terms of A).

amplitude = ... [1]

(b) State the phase difference between the vibrations of point X and point Y.

phase difference = ... [1]

(c) **(i)** State, in terms of f and L, the speed of the wave on the string.

speed = ... [1]

For Examiner's Use

(ii) The wave on the string is a stationary wave.

Explain, by reference to the formation of a stationary wave, what is meant by the speed stated in **(i)**.

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..... [3]