5 A stretched string PQ has length 1.2 m. One end of the string is attached to a vibration generator and the other end is attached to a wall, as shown in Fig. 5.1.

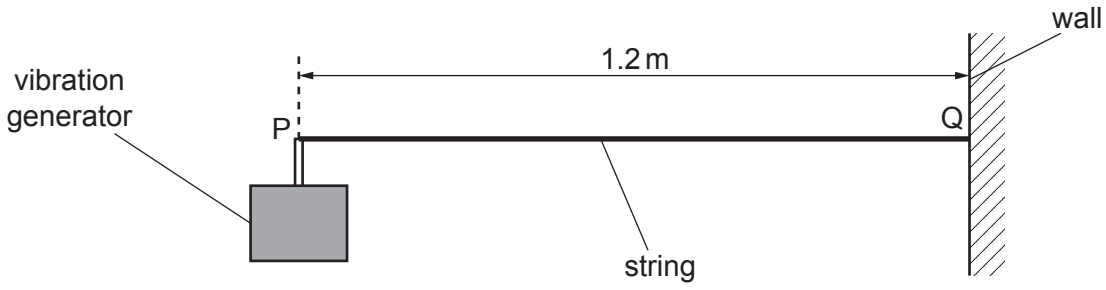

Fig. 5.1

The vibration generator is switched on and a stationary wave is formed on the string. The string is shown at one instant of time in Fig. 5.2.

Fig. 5.2

(a) Explain how a stationary wave is formed between the vibration generator and the wall.

.....

.....

.....

..... [2]

(b) Calculate the wavelength of the stationary wave shown in Fig. 5.2.

wavelength = ... m [1]

(c) Fig. 5.3 shows the stationary wave at time $t = 0$ when all points on the wave are at their maximum displacements.

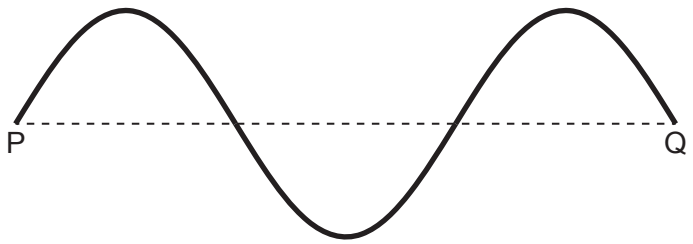

Fig. 5.3

The period of the wave is 0.16 s.

On Fig. 5.3, sketch the shape of the stationary wave at time $t = 0.24$ s. [2]

(d) Points R and T on the string are a horizontal distance of 0.30 m apart and in the positions shown in Fig. 5.4.

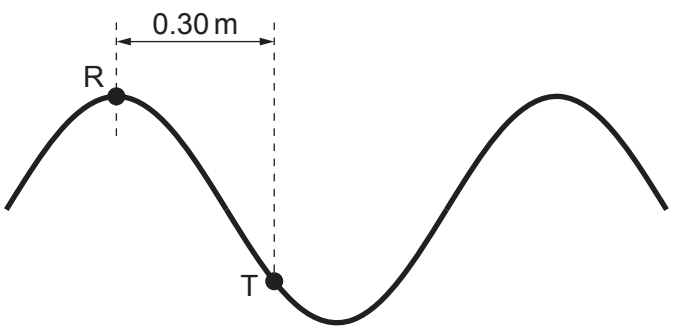

Fig. 5.4

State the phase difference between the oscillations of points R and T.

phase difference = ... ° [1]

(e) Calculate the speed of the progressive waves on the stretched string.

speed = ...m s^{-1} [2]

[Total: 9]