26 Two satellites in orbit around the Earth are at a constant distance of 100 km apart from each other.

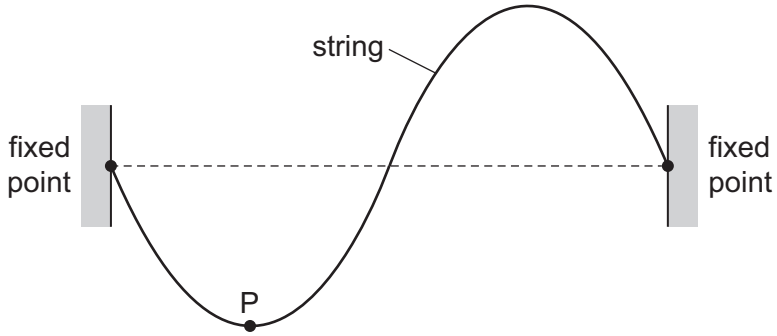
Satellite X transmits a microwave pulse towards satellite Y. The pulse takes time T to reach Y.

Satellite Y then transmits a pulse of visible light towards satellite X.

What is the time taken for the pulse of light to reach X?

A $10^{-5}\,T$ **B** $10^{-3}\,T$ **C** $10^{-2}\,T$ **D** T

27 A stationary wave is formed on a stretched string. The diagram illustrates the string at an instant of time when the displacement of the string is at its maximum.



The frequency of the wave is 250 Hz. Point P on the string has a vertical displacement of –1.0 mm.

What will be the vertical displacement of the point P after a time of 5.0 ms?

A –1.0 mm **B** zero **C** +0.5 mm **D** +1.0 mm

28 What is meant by *diffraction*?

A the change in observed frequency when a wave source moves relative to an observer

B the formation of nodes and antinodes by two progressive waves travelling in opposite directions

C the spreading of a wave around the edge of an obstacle

D the superposition of two waves when they meet

29 In a dark room, a small source of red light illuminates two slits that are 0.75 mm apart. A few metres beyond the slits, the light falls on a screen producing a series of equally spaced bright lines.

Which change would cause the distance between the bright lines on the screen to be reduced?

A Change the source for one emitting blue light.

B Reduce the distance between the light source and the slits.

C Reduce the distance between the slits to 0.55 mm.

D Reduce the intensity of the light source.