**4** **(a)** State what is meant by resonance.

.....

.....

..... [2]

**(b)** A small ball is held in place using a stretched string. One end of the string is fixed to a wall and the other end is attached to a vibration generator, as shown in Fig. 4.1.

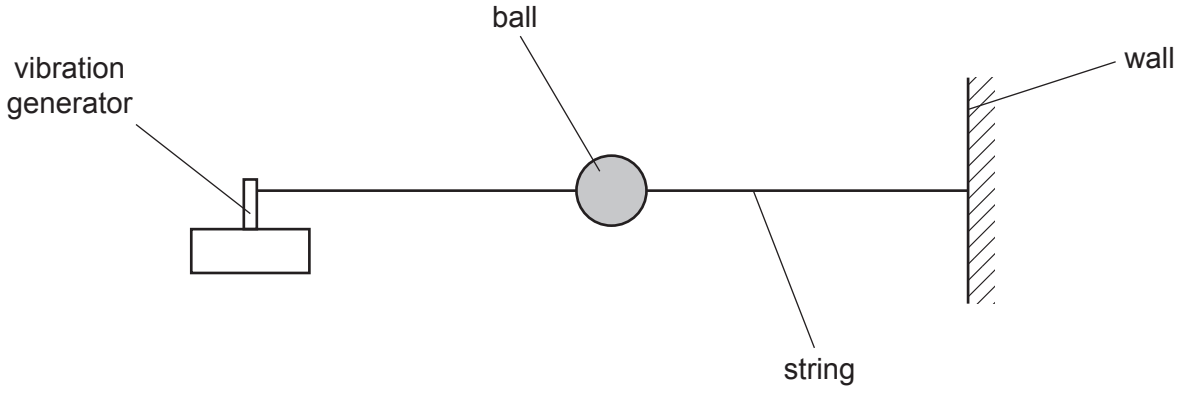


**Fig. 4.1**

Initially, the vibration generator is switched off.

A student displaces the ball vertically and then releases it. Fig. 4.2 shows the variation of the displacement of the ball with time after it is released.

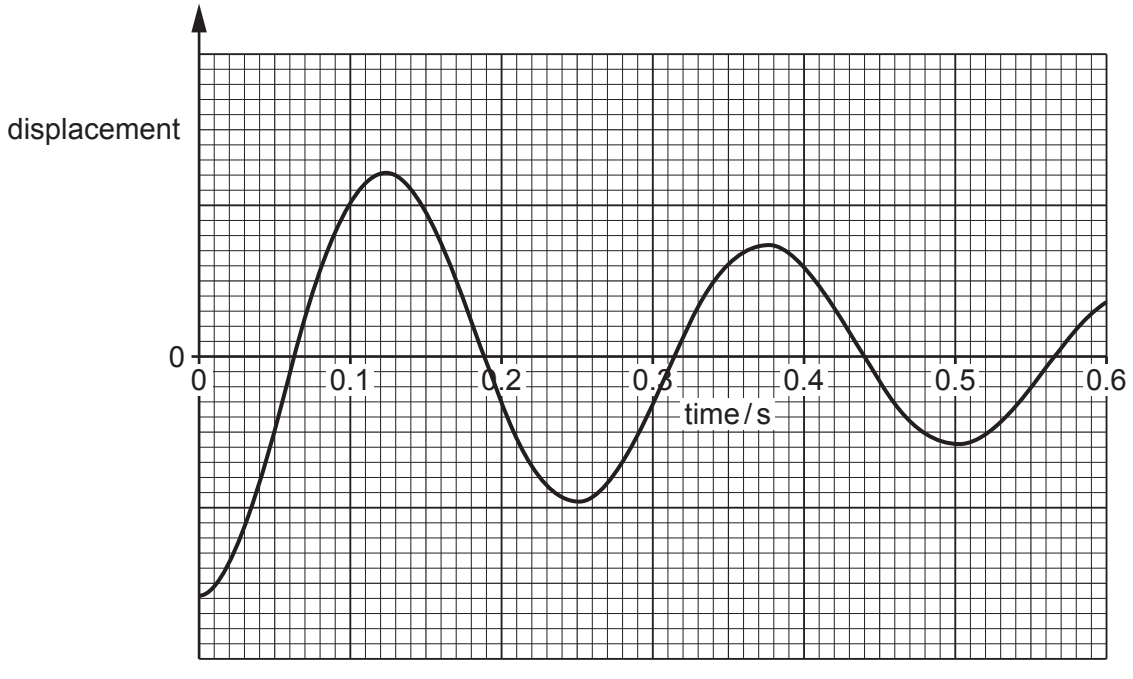


**Fig. 4.2**

**(i)** State the name of the phenomenon illustrated by the decrease in the amplitude of the oscillations in Fig. 4.2.

..... [1]

**(ii)** Explain the decrease with time of the amplitude of the oscillations of the ball.

.....

.....

..... [2]

**(iii)** Determine the frequency of the oscillations of the ball.

frequency = ..... Hz [1]

**(c)** The vibration generator in **(b)** is switched on and its frequency *f* of vibration is gradually increased from 0 to 10 Hz.

On Fig. 4.3, sketch the variation with *f* of the amplitude of the oscillations of the ball.

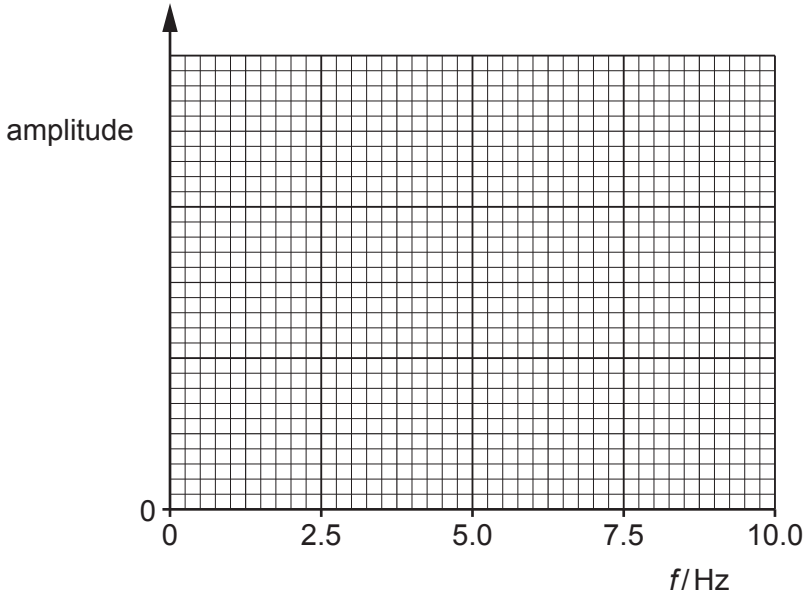


**Fig. 4.3**

[2]

[Total: 8]