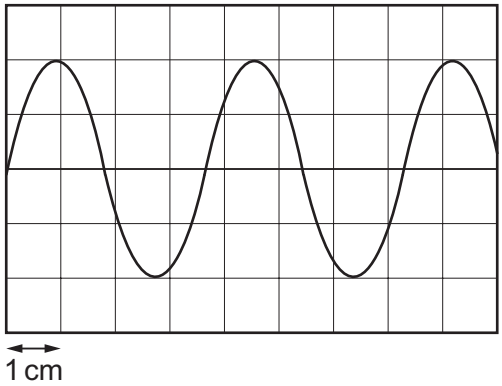
23 A sound wave of frequency 270 Hz is recorded by a cathode-ray oscilloscope (CRO). The waveform on the CRO is shown.



What is the time-base setting on the CRO?

A 0.1 ms cm^{-1} **B** 1 ms cm^{-1} **C** 10 ms cm^{-1} **D** 100 ms cm^{-1}

24 A motor boat vibrates in the water so that it produces water waves of frequency 0.20 Hz. The speed of these waves in the water is 20 m s^{-1}. The motor boat moves with a speed of 5.0 m s^{-1} directly towards a stationary sailing boat.

The Doppler effect equation for sound waves also applies to water waves.

What is the frequency with which the waves hit the stationary sailing boat?

A 0.15 Hz **B** 0.16 Hz **C** 0.25 Hz **D** 0.27 Hz

25 Infrared laser light is used for the transmission of data along optic fibres.

What is a typical wavelength of infrared radiation?

A 5×10^{-5} m **B** 5×10^{-7} m **C** 2×10^{-9} m **D** 2×10^{-11} m

26 An elastic string is attached to an oscillator at one end and clamped at the other end so that the string is horizontal and in tension.

The oscillator is made to oscillate vertically. The frequency of oscillation is gradually increased from zero until a stationary wave is set up in the string. The frequency is then increased further to frequency *f*, when a second stationary wave is set up in the string.

The frequency is then increased further.

At which frequency does a third stationary wave occur?

A 1.2*f* **B** 1.5*f* **C** 2.0*f* **D** 3.0*f*