22 An electromagnetic wave has a frequency of 10 Hz.

In which region of the electromagnetic spectrum does the wave occur?

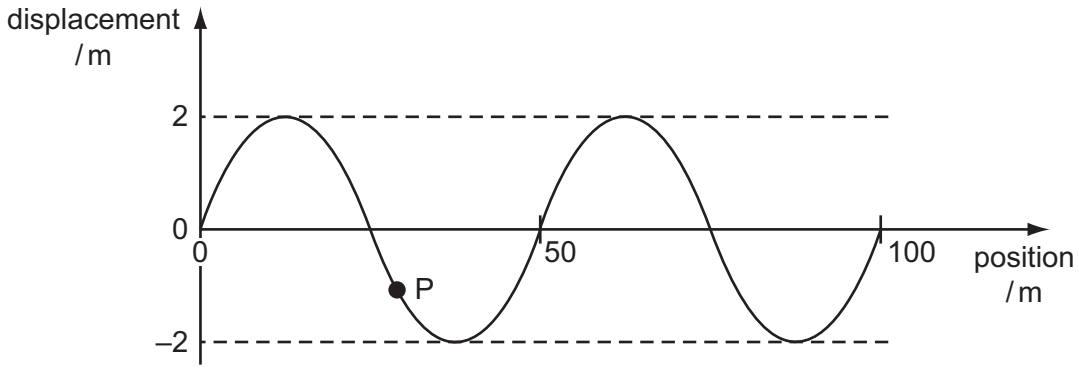
A infra-red

B radio

C ultraviolet

D visible

23 The graph represents a sinusoidal wave in the sea, travelling at a speed of 8.0 m s^{-1}, at one instant of time. The maximum speed of the oscillating particles in the wave is 2 af, where a is the amplitude and f is the frequency.



An object P of mass 2.0×10^{-3} kg floats on the surface.

What is the maximum kinetic energy of P due to the wave? Assume that its motion is vertical.

A 0.026 mJ **B** 4.0 mJ **C** 39 mJ **D** 64 mJ

24 Monochromatic light illuminates two narrow parallel slits. The interference pattern which results is observed on a screen some distance beyond the slits.

Which change increases the separation between the dark lines of the interference pattern?

A decreasing the distance between the screen and the slits

B increasing the distance between the slits

C using monochromatic light of higher frequency

D using monochromatic light of longer wavelength

25 A narrow beam of monochromatic light is incident normally on a diffraction grating. Third-order diffracted beams are formed at angles of 45° to the original direction.

What is the highest order of diffracted beam produced by this grating?

A 3rd **B** 4th **C** 5th **D** 6th