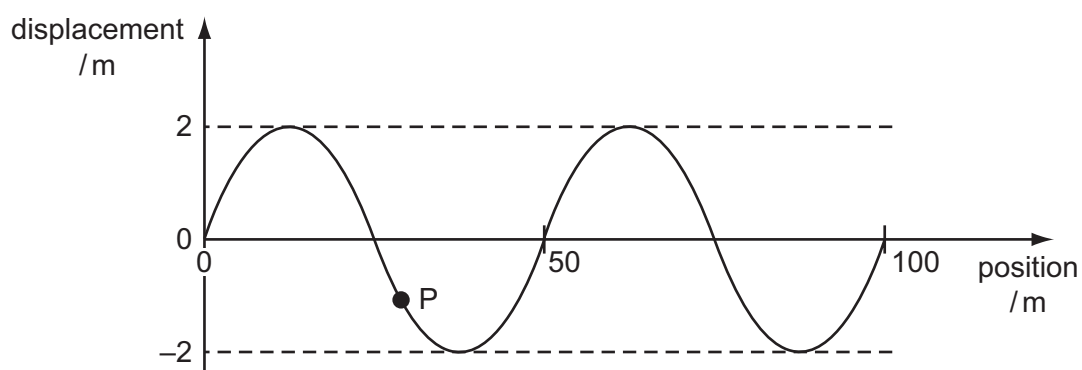


- 22 An electromagnetic wave has a frequency of 10 Hz.

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  $8.0 \text{ m s}^{-1}$ , at one instant of time. The maximum speed of the oscillating particles in the wave is  $2\pi af$ , where  $a$  is the amplitude and  $f$  is the frequency.



An object P of mass  $2.0 \times 10^{-3} \text{ kg}$  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  $45^\circ$  to the original direction.

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

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