

WAVES AND EM HW1 – CONTINUED

- 9 The diagram shows the main components of the electromagnetic spectrum.

P	X-rays	Q	visible light	infra-red	R	radio waves
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What are the components P, Q and R?

	P	Q	R
A	gamma-rays	microwaves	ultra-violet
B	gamma-rays	ultra-violet	microwaves
C	microwaves	gamma-rays	ultra-violet
D	microwaves	ultra-violet	gamma-rays

- 10 Radio waves, visible light and X-rays are all part of the electromagnetic spectrum.

Which is the correct order of increasing wavelength?

	shortest wavelength	→	longest wavelength
A	visible light	radio waves	X-rays
B	visible light	X-rays	radio waves
C	X-rays	radio waves	visible light
D	X-rays	visible light	radio waves

- 11 Which type of electromagnetic radiation travels at the highest speed through a vacuum?

- A gamma-rays
- B light waves
- C radio waves
- D none – all have the same speed

- 13 Some types and features of waves and their descriptions are shown in Fig. 12.1.

Draw **one** straight line from each description to a correct type or feature of a wave.

description	type or feature
wavelength less than visible light	amplitude
wavelength greater than visible light	frequency
the distance between the peak and the equilibrium point	X-ray
the number of oscillations every second	longitudinal
oscillations are parallel to the direction of the wave	radio
	transverse

Fig. 12.1

[5]

- 17 Some of the components of the electromagnetic spectrum are shown in Fig. 15.1.

radiowaves	A	infra-red	visible light	ultraviolet	B	gamma-rays
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Fig. 15.1

- (a) Name components **A** and **B**.

A

B

[2]

- (c) Some light has a frequency of 4.0×10^{14} Hz and a wavelength of 5.0×10^{-7} m in glass.

Calculate the speed of this light in glass.

speed = m/s [2]

- 18** Use words or numbers from the list to complete the sentences about electromagnetic waves.
Each word or number may be used once, more than once, or not at all.

3×10^8 3×10^6 gamma longitudinal radio transverse

All electromagnetic waves are

The electromagnetic wave with the longest wavelength is

They travel through a vacuum at a speed of m/s

[2]

- 19** Fig. 12.1 shows how the displacement of particles in a wave varies with distance along the wave.

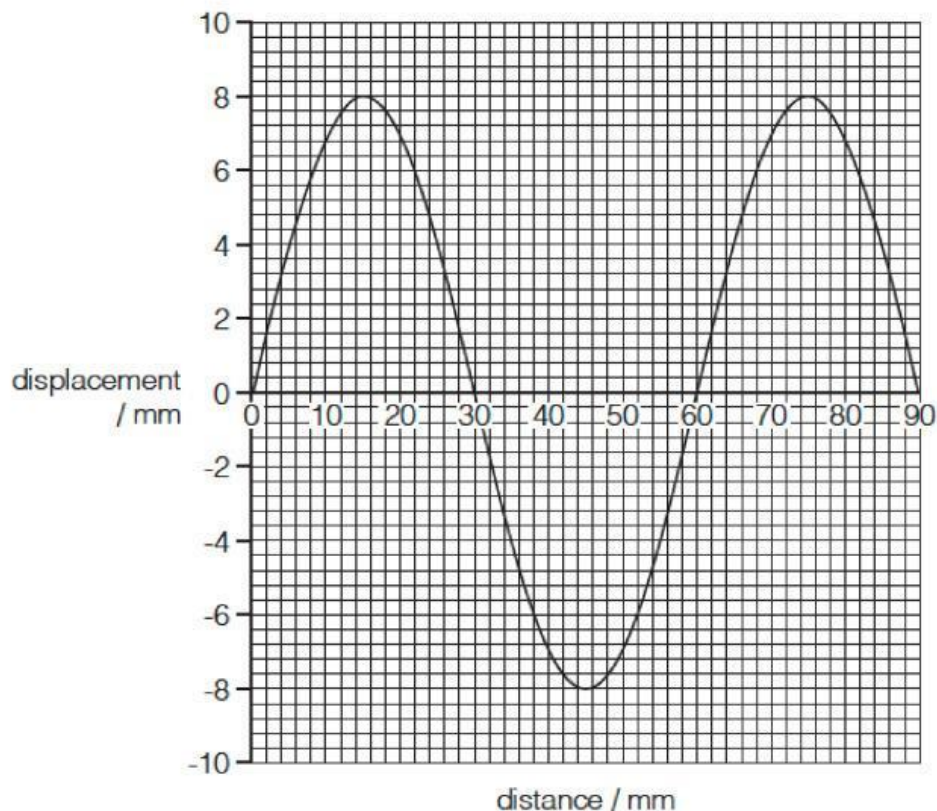


Fig. 12.1

- (a)** Use Fig. 12.1 to determine for this wave

(i) the wavelength, mm [1]

(ii) the amplitude. mm [1]

- (b)** Waves on the surface of water are transverse waves.

What is meant by a *transverse* wave?

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..... [2]