1 There are many different types of waves.

(a) Waves on the surface of water are transverse waves.

Sound waves are longitudinal waves.

Describe the difference between transverse waves and longitudinal waves.

(2)

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(b) Figure 1 shows a ripple tank.

This is used to study the behaviour of water waves.

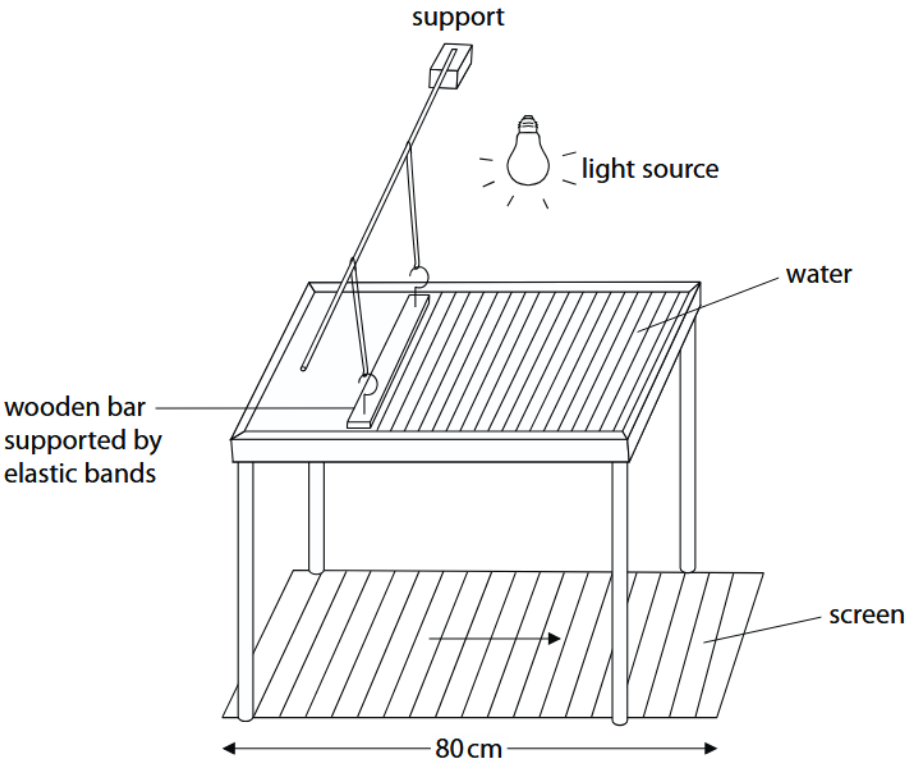

Figure 1

Water waves are produced in the tank.

The shadow of the waves is projected onto the screen below the tank.

The waves appear to move in the direction of the arrow.

(i) Describe how to determine the frequency of the waves.

(2)

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(ii) The screen is 80 cm long.

What is the approximate wavelength of the waves as seen on the screen?

(1)

☒ **A** 4 cm

☒ **B** 8 cm

☒ **C** 40 cm

☒ **D** 80 cm

(iii) A student uses the image to estimate the speed of the water wave as 75 cm/s.

Which of these is a reason why the estimate is not correct?

(1)

☒ **A** the student used a ruler without mm markings

☒ **B** the light was not bright enough

☒ **C** the student's measurement was inaccurate

☒ **D** the wave seen on the screen is magnified

(Total for Question 1 = 6 marks)

Question number	Answer	Mark
1(a)	An answer that provides a description by making reference to: • transverse waves have oscillations perpendicular to direction of travel of the wave (1) • whereas longitudinal waves have oscillations in the same direction as the direction of travel of the wave (1)	**(2)**

Question number	Answer	Mark
1(b)(i)	An answer that combines the following points of understanding to provide a logical description: • take time T for waves to pass a fixed point (1) • and frequency = $\frac{\text{number of waves}}{\text{time taken}}$ (1)	**(2)**

Question number	Answer	Mark
1(b)(ii)	A	**(1)**

Question number	Answer	Mark
1(b)(iii)	D	**(1)**