

**GCSE Physics A (Gateway)**  
**J249/04 Physics A P5-P8 and P9 (Higher Tier)**

**Question Set 15**

1 (a)

A crowd makes a Mexican wave.

A Mexican wave **starts** with people lifting and lowering their arms.



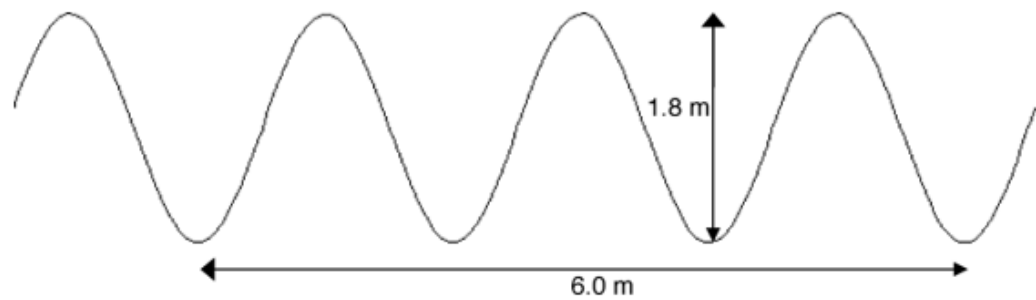
The Mexican wave **continues** by people, next to them, lifting and lowering their arms.

Why is a Mexican wave an example of a transverse wave?

[1]

(b) In the classroom a teacher demonstrates waves using a rope.

Look at the diagram of the wave.



(i) The frequency of the wave is 2 Hz.

What does this statement mean?

[2]

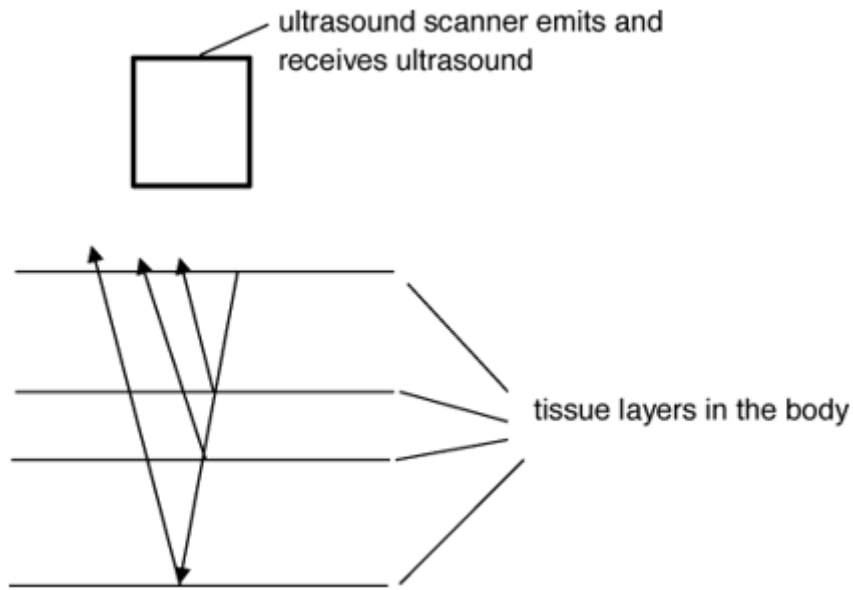
(ii) How many seconds will it take for this wave to travel 12 m?

Show your working.

Answer = ..... seconds

[3]

(c) Ultrasound scans are used to produce images of tissues inside the body.



Ultrasound waves are emitted.

The waves reflect from layers of tissue inside the body.

Explain how the reflections are used to produce an image of the tissues.

[3]

(d) Ultrasound and X-rays are used to scan patients in hospitals.

Complete the table to show a medical use, benefits and risk of using these waves to scan patients.

Wave	Medical use	Example of a benefit	Risk
X-rays	Shows up hard tissues inside the body.	Takes images of broken bones.	Damages living cells by causing: ..... ..... .....
Ultrasound	..... ..... ..... .....	..... ..... ..... .....	None

[3]

**Total Marks for Question Set 15: 12**

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