Waves – 2023 IGCSE Physics 0625

1. Nov/2023/Paper_ 0625/11/No.17

Which statements about waves are correct?

1 Only longitudinal waves can undergo diffraction.

2 All waves can undergo refraction.

3 All waves can undergo reflection.

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

2. Nov/2023/Paper_ 0625/11/No.18

Which quantities relating to a wave on the surface of water can **both** be measured in metres?

A amplitude and frequency

B amplitude and wavelength

C amplitude and wave speed

D frequency and wavelength

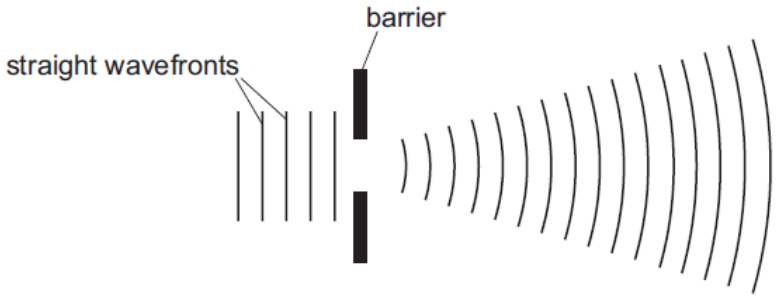
3. Nov/2023/Paper_ 0625/12/No.17

Which description and example are correct for a transverse wave?

	description	example
A	The direction of vibration is parallel to the direction of propagation.	sound
B	The direction of vibration is parallel to the direction of propagation.	waves on a rope
C	The direction of vibration is at right angles to the direction of propagation.	sound
D	The direction of vibration is at right angles to the direction of propagation.	waves on a rope

4. Nov/2023/Paper_ 0625/12/No.18

Straight wavefronts on the surface of a ripple tank approach a gap in a barrier. The diagram shows how the wavefronts change shape as they pass through the gap.



What is the name of this effect?

A diffraction

B propagation

C reflection

D refraction

5. Nov/2023/Paper_ 0625/13/No.17

Which statement about waves is correct?

A All waves can travel through a vacuum.

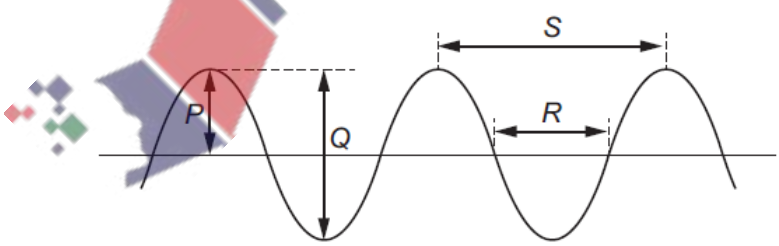
B All waves travel at the same speed.

C Seismic S-waves can be modelled as longitudinal waves.

D Waves transfer energy without transferring matter.

6. Nov/2023/Paper_ 0625/13/No.18

The diagram shows a transverse wave.



Which row identifies the amplitude and the wavelength of the wave?

	amplitude	wavelength
A	*P*	*R*
B	*P*	*S*
C	*Q*	*R*
D	*Q*	*S*

7. Nov/2023/Paper_ 0625/21/No.18

Which quantities relating to a wave on the surface of water can **both** be measured in metres?

A amplitude and frequency

B amplitude and wavelength

C amplitude and wave speed

D frequency and wavelength

8. Nov/2023/Paper_ 0625/22/No.17

A student writes down some facts about two transverse waves.

Wave 1 has a frequency f and a velocity v.

Wave 2 has four times the frequency of wave 1 and is travelling at a velocity of $2v$.

What is the wavelength of wave 2 in terms of f and v?

A $\frac{2f}{v}$ **B** $8fv$ **C** $\frac{2v}{f}$ **D** $\frac{v}{2f}$

9. Nov/2023/Paper_ 0625/22/No.18

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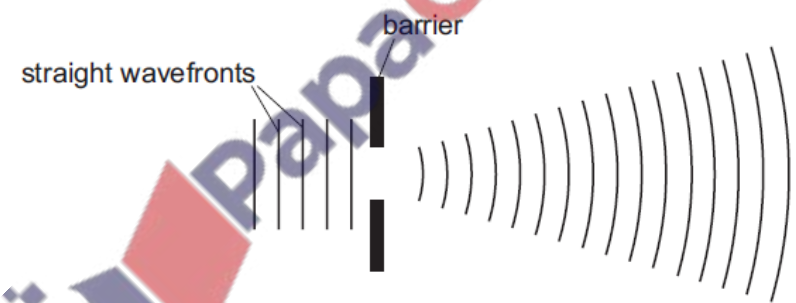


What is the name of this effect?

A diffraction

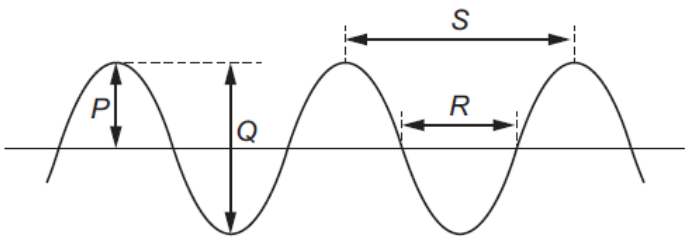
B propagation

C reflection

D refraction

10. Nov/2023/Paper_ 0625/23/No.18

The diagram shows a transverse wave.



Which row identifies the amplitude and the wavelength of the wave?

	amplitude	wavelength
A	*P*	*R*
B	*P*	*S*
C	*Q*	*R*
D	*Q*	*S*

11. Nov/2023/Paper_ 0625/43/No.5

(a) Fig. 5.1 is a scale diagram of wavefronts of red light approaching a gap in a barrier.

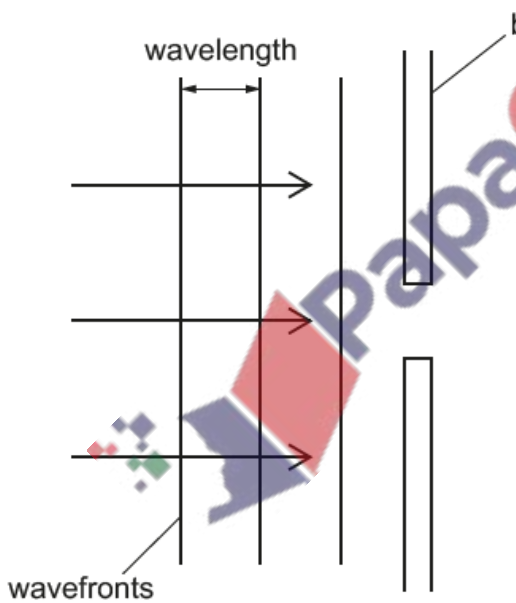


Fig. 5.1

On Fig. 5.1, draw **three** wavefronts after the wave has passed through the gap. [3]

(b) Fig. 5.2 shows the same barrier and gap. A wave of blue light approaches this barrier.

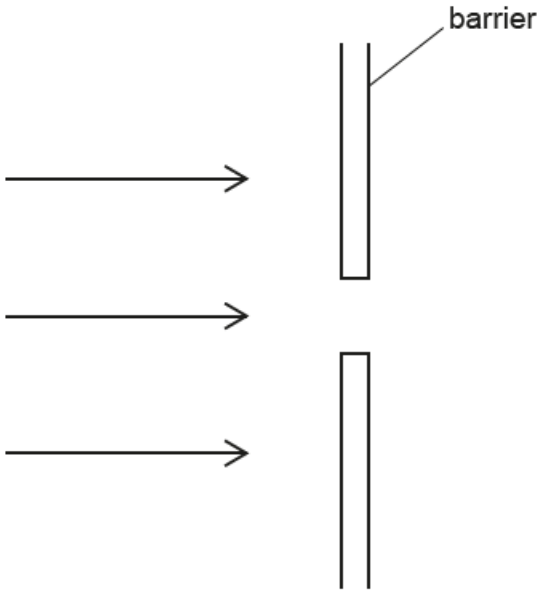


Fig. 5.2

On Fig. 5.2:

- draw **three** wavefronts of this wave before it reaches the barrier
- draw **three** wavefronts after the wave passes through the gap.

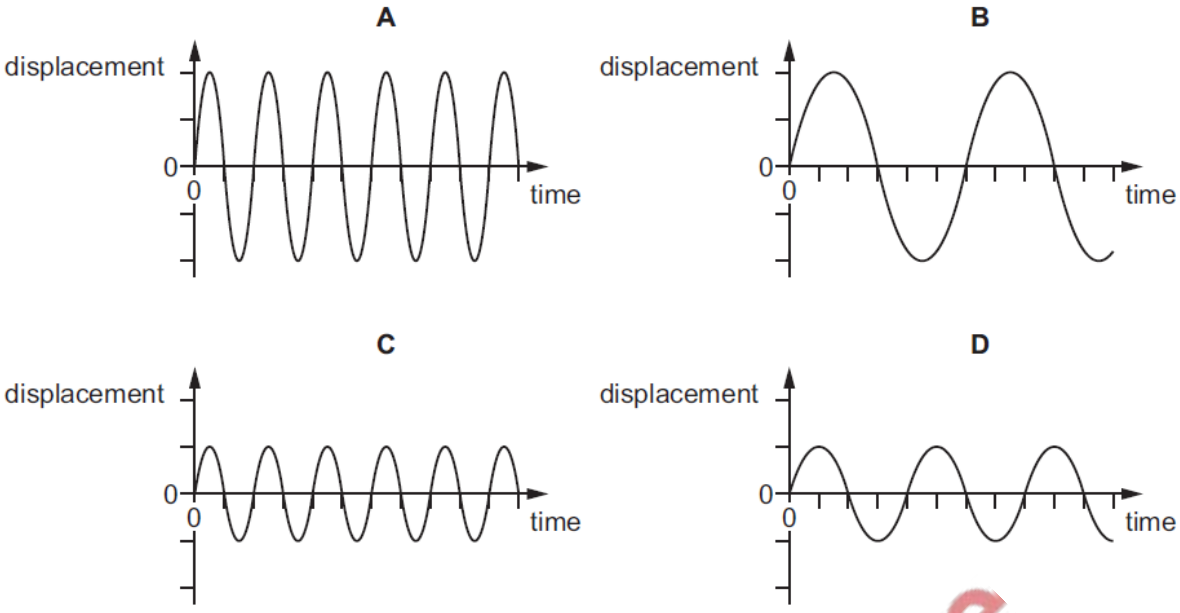
[3]

[Total: 6]

12. June/2023/Paper_0625/11/No.17

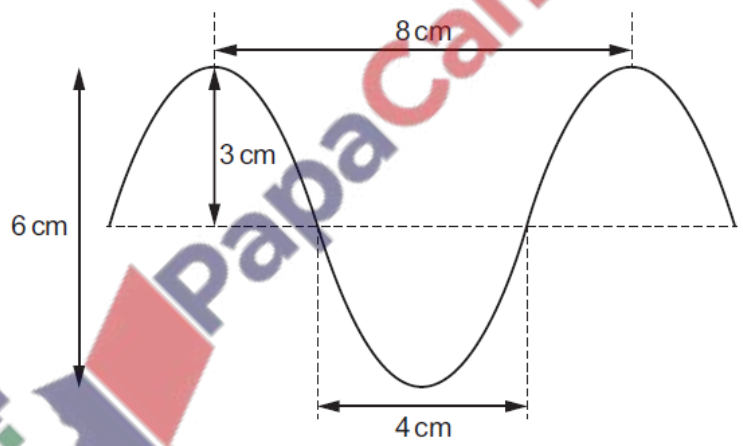
The diagrams show graphs of displacement against time for four waves. All the graphs are drawn to the same scale.

Which wave has the largest amplitude and the highest frequency?



13. June/2023/Paper_0625/12/No.17

The diagram shows a wave.

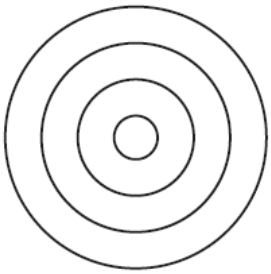


What are the amplitude and the wavelength of this wave?

	amplitude / cm	wavelength / cm
A	3	4
B	3	8
C	6	4
D	6	8

14. June/2023/Paper_0625/13/No.17

A drop of water from a tap falls onto the surface of some water of constant depth.



view from above

Water waves spread out on the surface of the water.

Which statement is correct?

A The waves are longitudinal and travel at the same speed in all directions.

B The waves are longitudinal and travel more quickly in one direction than in others.

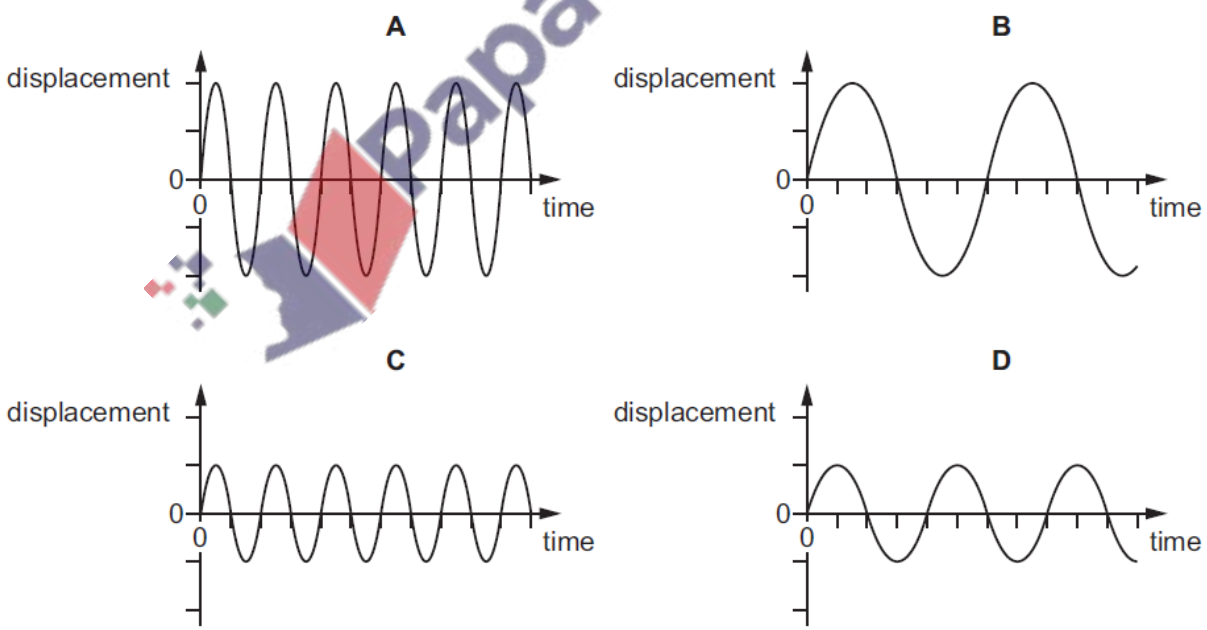
C The waves are transverse and travel at the same speed in all directions.

D The waves are transverse and travel more quickly in one direction than in others.

15. June/2023/Paper_0625/21/No.17

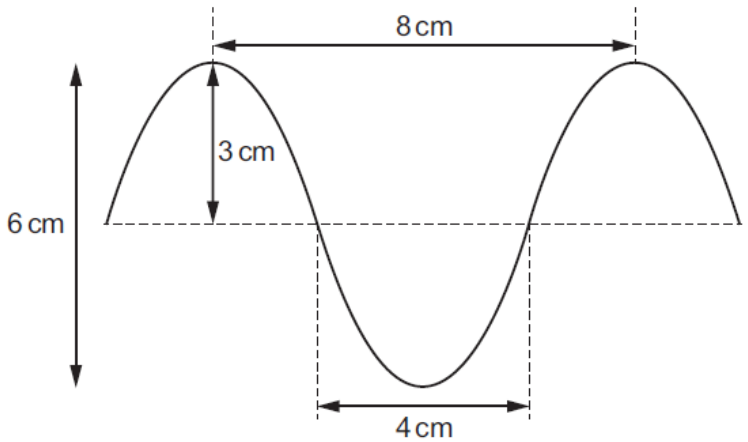
The diagrams show graphs of displacement against time for four waves. All the graphs are drawn to the same scale.

Which wave has the largest amplitude and the highest frequency?



16. June/2023/Paper_0625/22/No.17

The diagram shows a wave.

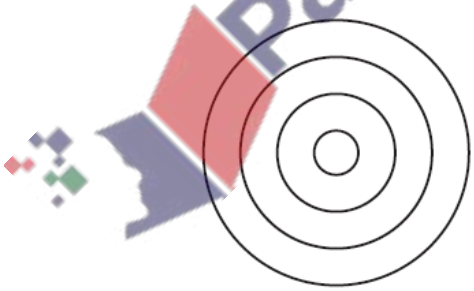


What are the amplitude and the wavelength of this wave?

	amplitude / cm	wavelength / cm
A	3	4
B	3	8
C	6	4
D	6	8

17. June/2023/Paper_0625/23/No.17

A drop of water from a tap falls onto the surface of some water of constant depth.



view from above

Water waves spread out on the surface of the water.

Which statement is correct?

A The waves are longitudinal and travel at the same speed in all directions.

B The waves are longitudinal and travel more quickly in one direction than in others.

C The waves are transverse and travel at the same speed in all directions.

D The waves are transverse and travel more quickly in one direction than in others.

18. June/2023/Paper_0625/31/No.6

A student observes waves on the surface of water in a tank. The waves all have the same wavelength.

(a) The student measures the wavelength of the waves by measuring the distance between one peak and the next peak.

Describe a more accurate method for determining the wavelength.

.....

..... [2]

(b) The wavelength of the waves is 4.0 cm and their frequency is 6.0 Hz.

Calculate the wave speed.

wave speed = ... cm/s [3]

(c) Fig. 6.1 shows water waves in the tank travelling from deep water to shallow water.

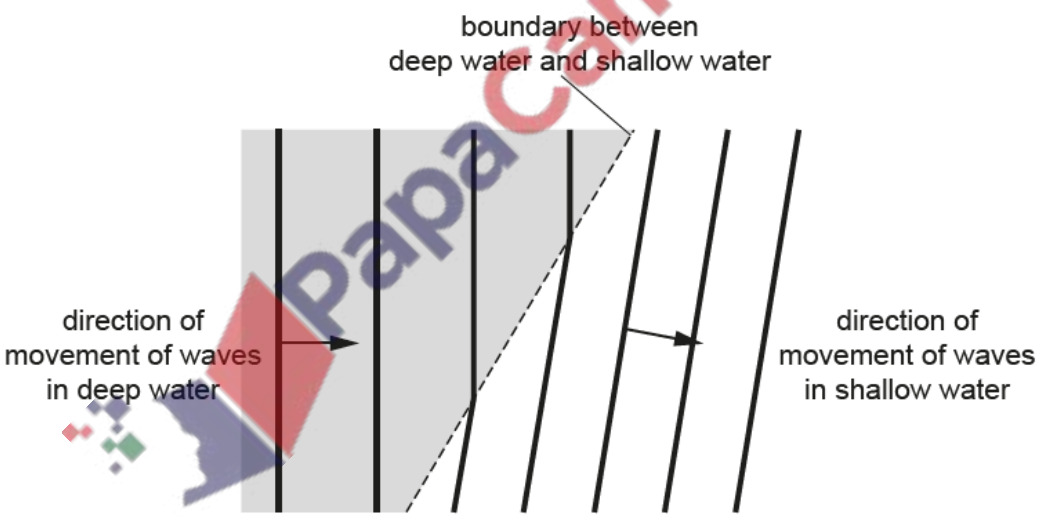


Fig. 6.1

State and explain what happens to the waves as they move from deep water to shallow water.

name of effect .....

explanation .....

.....

[2]

[Total: 7]

19. June/2023/Paper_0625/33/No.5

A teacher demonstrates the behaviour of waves by using water waves in a ripple tank.

Fig. 5.1 shows a cross-section through part of the water waves.

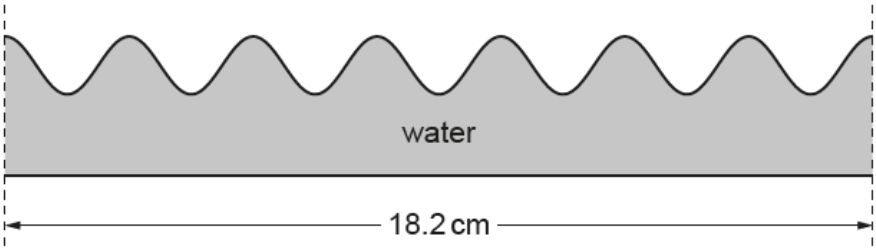


Fig. 5.1 (not to scale)

(a) Calculate the wavelength of the water waves. Use the information in Fig. 5.1.

wavelength = ... cm [2]

(b) The teacher places a pointer above the water waves as shown in Fig. 5.2.

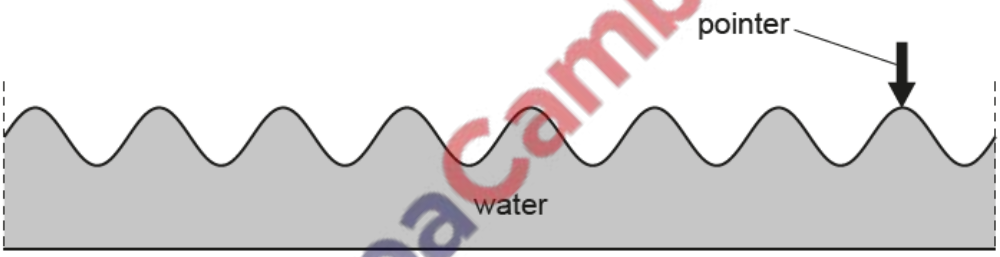


Fig. 5.2 (not to scale)

Three students use stop-watches to measure the time taken for 50 peaks to pass the pointer. Fig. 5.3 shows the measurements.

time = ... s time = ... s time = ... s

Fig. 5.3

(i) On the line below each stop-watch, state the time measurement, in seconds. [1]

(ii) Calculate the average of the three time measurements in **(b)(i)**.

average time = ... s [2]

(iii) Calculate the frequency of the water waves using your result in **(b)(ii)**.

frequency = ... Hz [2]

(c) The teacher repeats the demonstration using a different ripple tank and obtains these results for the waves.

wavelength = 0.025 m
frequency = 2.4 Hz

Calculate the speed of the wave.

speed of wave = ... m/s [3]

[Total: 10]

20. June/2023/Paper_0625/42/No.6

Two types of seismic waves are P-waves and S-waves.

(a) State the types of wave that P-waves and S-waves can be modelled as.

P-waves .....

S-waves .....

[2]

(b) The velocity of a P-wave in the Earth's solid crust is 7.2 km/s and its frequency is 4.5 Hz.

Calculate the wavelength of this P-wave.

wavelength = ... [3]

[Total: 5]