General Wave Properties – 2021 O Level 5054

1. Nov/2021/Paper_11/No.17

A water wave on a pond passes into a region where the wave travels more slowly. It then returns to a region where it travels at the original speed. Assume that the frequency of the wave stays constant.

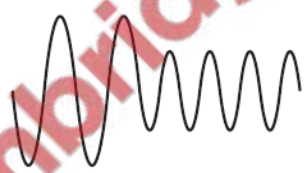
Which side-view of the wave is correct?

A

B

C

D



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2. Nov/2021/Paper_11/No.18

What is meant by the *amplitude* of a wave?

A the distance between the extreme points of a particle's motion

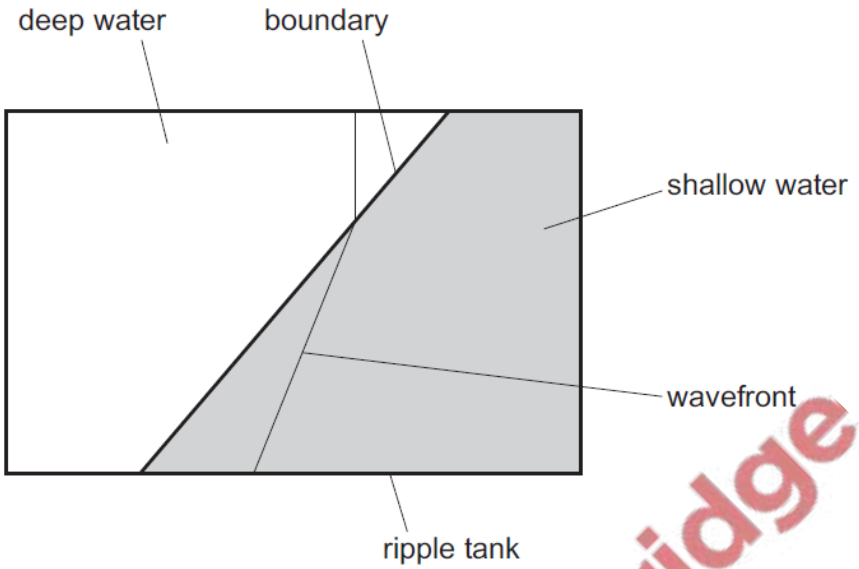
B the maximum distance a particle moves from its equilibrium position

C the maximum energy carried by the wave

D the maximum power of the vibrations carrying the wave

3. Nov/2021/Paper_11/No.19

The diagram shows one wavefront of a wave as it travels from deep water to shallow water in a ripple tank.



What happens as the wavefront moves into the shallow water?

A The speed of the wavefront increases.

B The speed of the wavefront decreases.

C The wavelength of the wave remains constant.

D The wavelength of the wave increases.

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4. Nov/2021/Paper_12/No.22

Which example describes a transverse wave being refracted?

A infrared waves travelling in an optical fibre

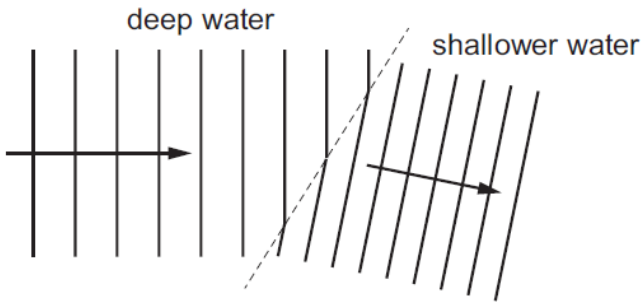
B light waves from an object entering a magnifying glass

C ultrasound waves being used to clean jewellery

D water waves hitting a barrier

5. June/2021/Paper_11/No.20

A water wave in a ripple tank refracts as it moves from deep water into shallower water.



What happens to the speed and to the frequency of the wave as it moves into shallower water?

	speed	frequency
A	decreases	stays constant
B	increases	stays constant
C	stays constant	decreases
D	stays constant	increases

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6. June/2021/Paper_21/No.4

(a) Fig. 4.1 shows a wave on a rope and Fig. 4.2 shows a wave on a spring. Both waves are moving in the direction shown by the arrows.

Fig. 4.1

Fig. 4.2

(i) State the name of each of the two types of wave shown.

Fig. 4.1 .....

Fig. 4.2 .....

[1]

(ii) On Fig. 4.1, draw a wave which has a smaller frequency than the wave shown. [1]

(iii) Describe the movement of point X on the spring in Fig. 4.2 as the wave passes.

.....

..... [1]

(b) Table 4.1 shows some sentences that a student writes about waves.

His teacher places a ring around each mistake.

Write a suitable correction for each mistake in Table 4.1. One has been done for you.

Table 4.1

sentence	correction
Sound travels at 3.0 × 10^8 m/s in air.	330
Sound with a higher pitch has a larger amplitude.	
X-rays are used for pre-natal scanning.	
In the electromagnetic spectrum, microwaves have the highest frequency.	

[3]

[Total: 6]

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7. June/2021/Paper_22/No.10a

(a) Fig. 10.1 shows a water wave moving from shallow into deep water. The wavefronts shown represent the crests of the wave.

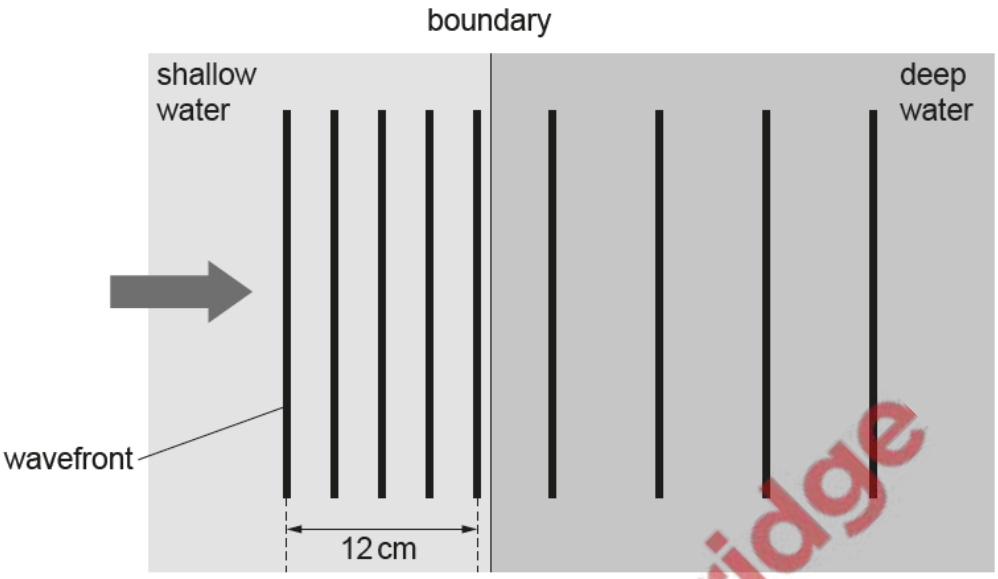

Fig. 10.1 (not to scale)

The water wave is made by dipping a wooden bar up and down in the water. The bar makes 10 complete up and down movements in 5.0 s.

(i) Determine the wavelength of the wave in the shallow water.

wavelength = ... [1]

(ii) Calculate the frequency of the wave produced.

frequency = ... [2]

(iii) Determine the speed of the water wave in the shallow water.

speed = ... [2]

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(iv) On Fig. 10.2, draw lines to show what happens to the wavelength, the frequency and the speed of the water wave as it enters the deep water.

One line has been drawn for you.

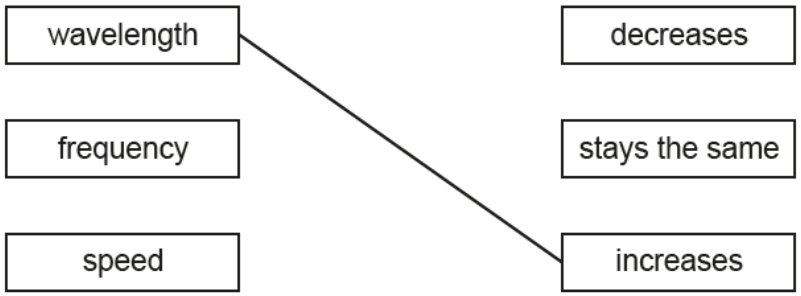

Fig. 10.2

[1]

(v) The direction of the boundary is now altered. The water wave now enters the deep water from the shallow water at an angle, as shown in Fig. 10.3.

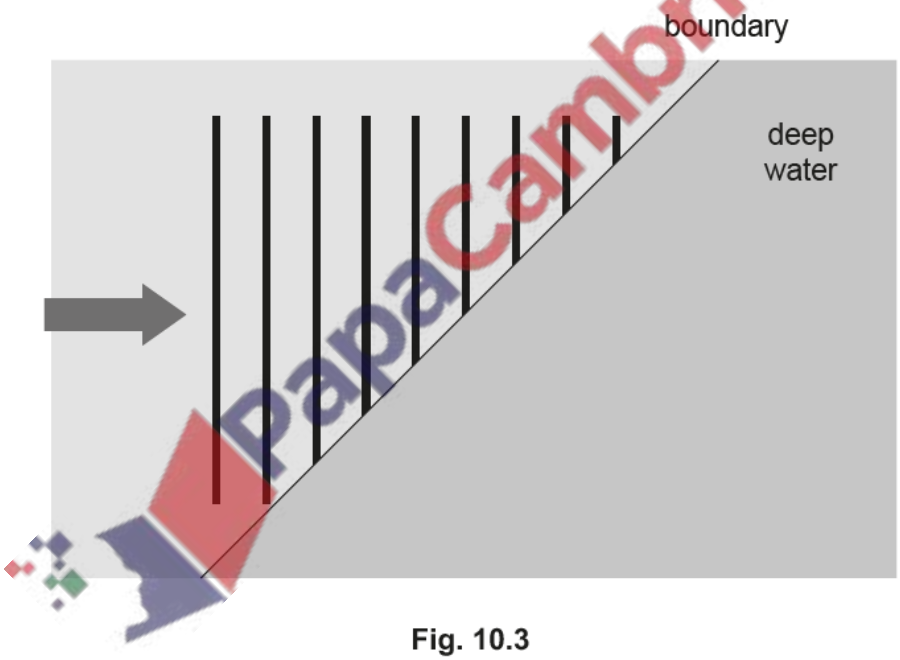

Fig. 10.3

On Fig. 10.3, draw the wavefronts in the deep water. [3]

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