National 5 Physics

Waves

Check Tests

1. The diagram represents a water wave.
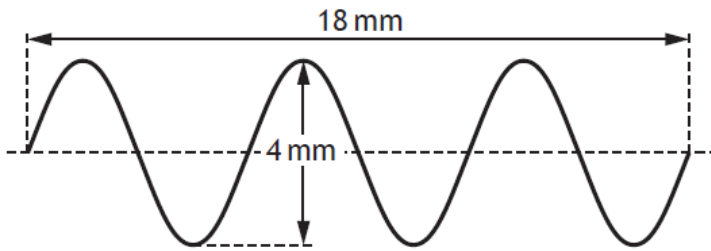
The wavelength of the water wave is

A   2 mm

B   3 mm

C   4 mm

D   6 mm

E   18 mm.

2. A ship is fitted with echo-sounding equipment. A pulse of sound is sent downwards from the ship at a speed of 1500 ms^{-1}.

The seabed is 600 m below the ship.

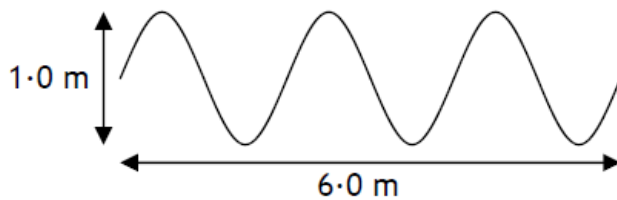How long will it take the pulse of sound to return to the ship?

A   0.4 s

B   0.8 s

C   1.25 s

D   1.5 s

E   2.5 s

3. A clap of thunder is heard 2·40 s after a flash of lightning.

The distance to the thunderstorm is

A 7·06 × 10⁻³ m

B 142 m

C 340 m

D 408 m

E 816 m.

4. A wave is shown below.

Which row in the table is correct?

|	Amplitude/m	Wavelength/m
A	0·5	1·0
B	0·5	2·0
C	1·0	2·0
D	1·0	3·0
E	1·0	6·0

5. A wave moves at 3×10^8 ms⁻¹ with a wavelength of 600 nm. The frequency of the wave is

A 180 Hz

B 1800 Hz

C $1·8 \times 10^{12}$ Hz

D 5×10^{14} Hz

E 2×10^{-15} Hz

6.	A student makes the following statements about waves.

	I	Waves transfer energy.

	II	A wave with a short wavelength diffracts more than a wave with a long wavelength.

	III	The amplitude of a wave depends on its wavelength.

	Which of these statements is/are correct?

	A	I only
	B	II only
	C	III only
	D	I and II only
	E	I and III only

7.	The diagram represents the position of the crests of waves 3 seconds after a stone is thrown into a pool of still water.

crest

6·0 m

1·0 m
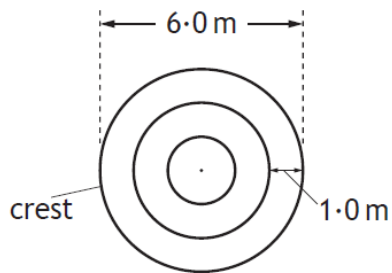
	Which row in the table shows the speed and the frequency of the waves?

	Speed (m s⁻¹)	Frequency (Hz)
A	0·33	3
B	0·33	1
C	1·0	1
D	1·0	3
E	1·0	4

8.	A wave with a period of 0.25 s has a frequency of

	A	0.0625 Hz
	B	0.25 Hz
	C	0.5 Hz
	D	4 Hz
	E	400 Hz

9. A wave machine in a swimming pool generates 15 waves per minute. The wavelength of these waves is 2.0 m.

    The frequency of the waves is

    A   0.25 Hz

    B   0.50 Hz

    C   4.0 Hz

    D   15 Hz

    E   30 Hz

10. Which of the following waves is **not** a transverse wave?

    A   Microwaves

    B   Radio waves

    C   Sound waves

    D   Light waves

    E   Ultraviolet waves

11. A wave is represented in the diagram below.
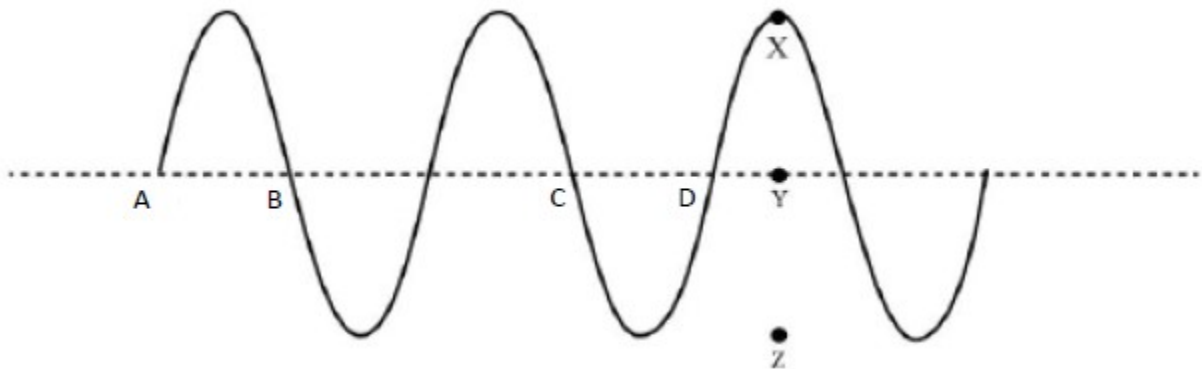
    (a)   Identify two points on the diagram which are **one** wavelength apart.   **1**

    (b)   Identify two points on the diagram which are **two** wavelengths apart.   **1**

    (c)   Identify two points on the diagram which are separated by a distance equal to the
           amplitude of the wave.   **1**

12. A wave machine produces waves of a certain frequency in a swimming pool.

The machine produces 24 waves per minute. The waves produced have a speed of 0.80 ms^{-1}.

    (a)   What is meant by the term frequency? **1**

    (b)   Calculate the frequency of the waves. **3**

    (c)   Calculate the wavelength of the waves. **3**

    (d)   Calculate the time taken for a wave to travel a distance of 10 m in the pool. **3**

13. A ripple tank is set up to investigate the properties of water waves. A wave generator is used to produce the waves in the tank.

    (a)   When the wave generator is vibrating at 5 Hz, it is found that there are 8 complete waves between the generator and the opposite side of the tank, as shown below.
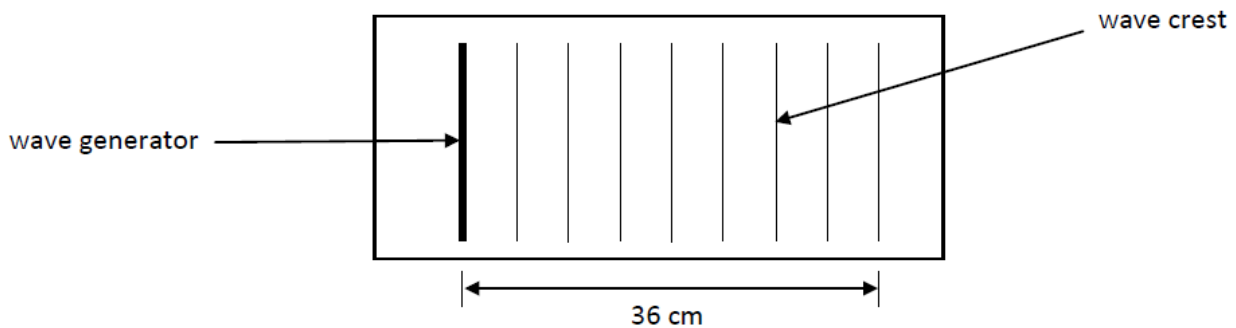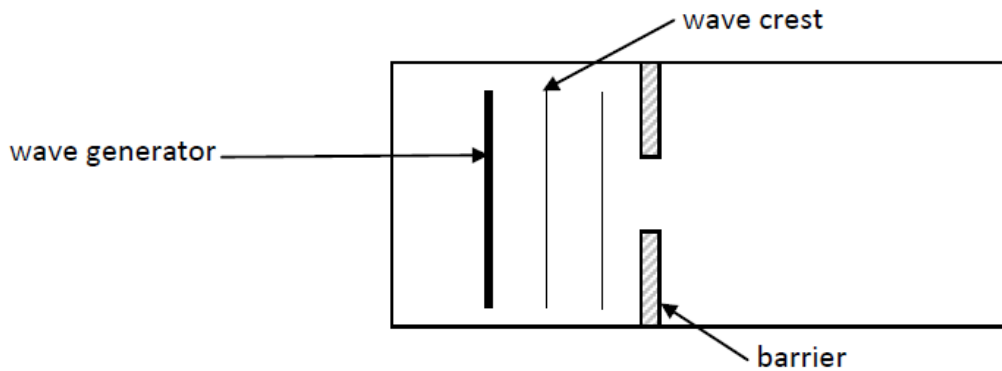

        Calculate the speed of the water waves. **4**

13.   (continued)

(b)   A barrier with a wide gap in it is placed across the middle of the tank as shown below.

(i)   Copy and complete the diagram to show the wave pattern on the right hand side of the barrier.   **2**

(ii)   What term is used to describe what happens to the water waves as they pass through the gap?   **1**

Total Marks: 30