

# Properties of Waves

## Question Paper

Level	GCSE
Subject	Physics
Exam Board	Edexcel IGCSE
Module	Single Award (Paper 2P)
Topic	Waves
Sub-Topic	Properties of Waves
Booklet	Question Paper

**Time Allowed:** 40 minutes

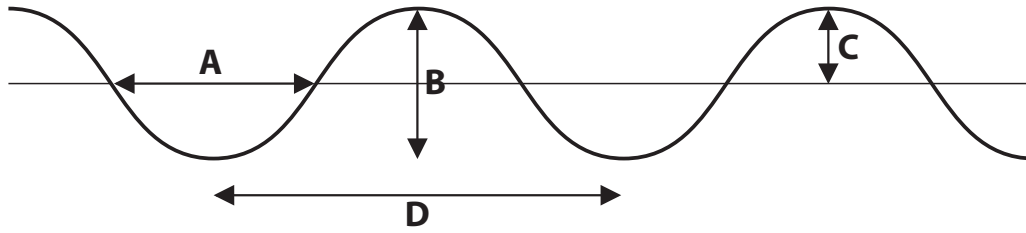
**Score:** /33

**Percentage:** /100

**Grade Boundaries:**

A*	A	B	C	D	E	U
>85%	75%	70%	60%	55%	50%	<50%

1. The diagram shows a wave on the sea.



(a) (i) Which letter shows the wavelength of the wave?

(1)

- A
- B
- C
- D

(ii) Which letter shows the amplitude of the wave?

(1)

- A
- B
- C
- D

(b) A man watches some waves pass his boat.

He sees the crest of the waves pass him every 5 s.

Calculate the frequency of these waves.

(2)

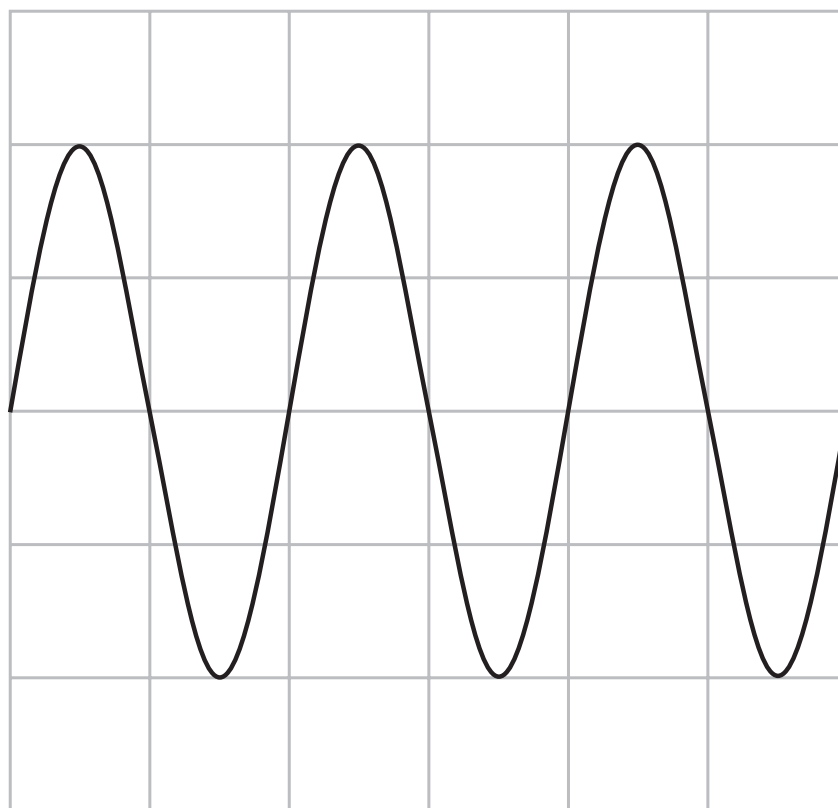
Frequency = ..... Hz

**(Total for Question 1 = 4 marks)**

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2. A microphone is connected to an oscilloscope to display a sound wave.

The diagram shows the trace on the oscilloscope screen.



The oscilloscope settings are:

Y direction: 1 square = 1 V

X direction: 1 square = 0.001 s

(a) (i) How many time periods are shown on the trace?

(1)

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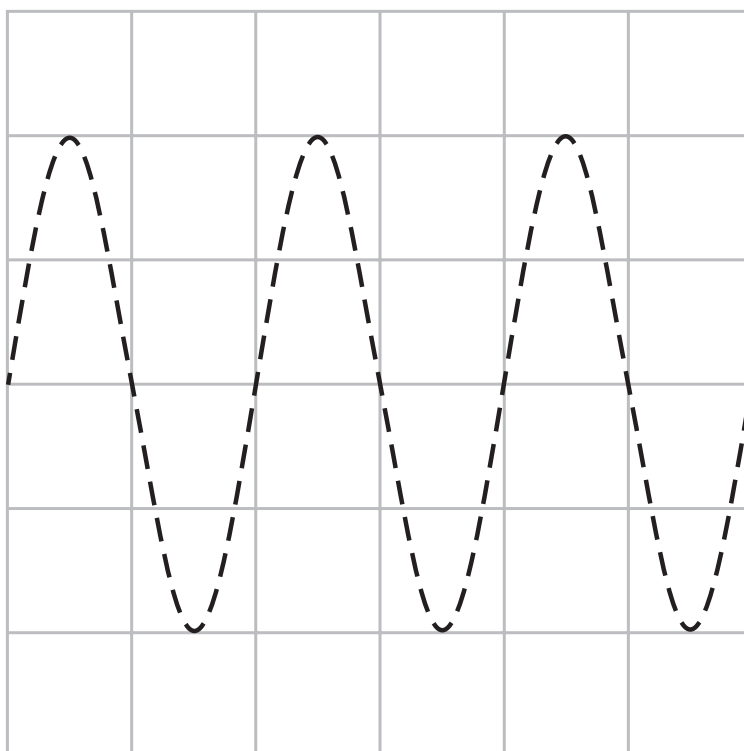
(ii) What is the frequency of the sound wave?

(2)

Frequency = ..... Hz

(b) On the grid below, sketch the trace of a sound wave with a smaller amplitude and a higher frequency than the wave shown by the dotted line.

(2)



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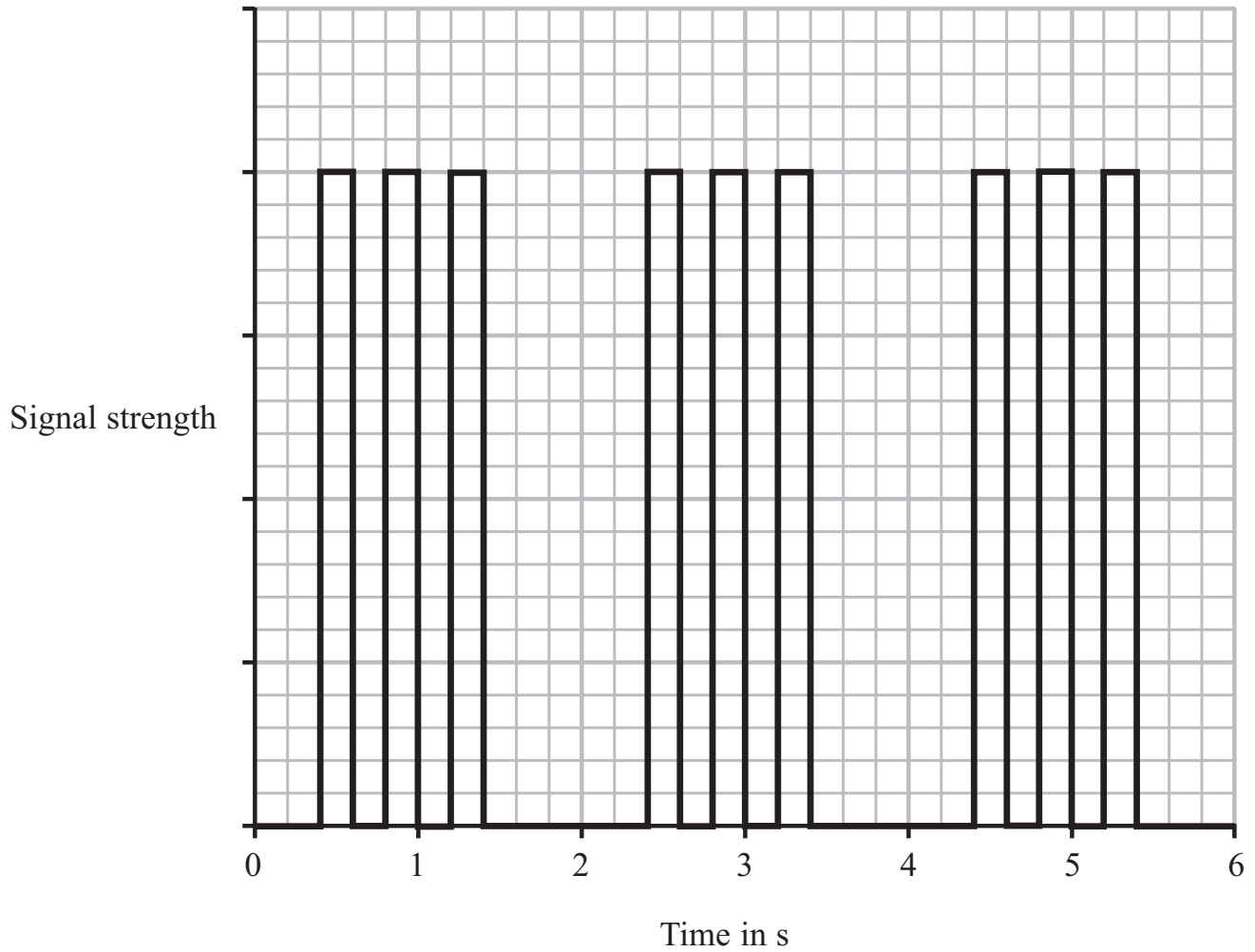
(Total for Question 2 = 5 marks)

3. In 1901, Marconi received the first radio signal across the Atlantic Ocean.

The signal was the letter S in Morse code (three 'dots') sent over and over again.

Each letter S was produced by quickly turning an electric spark on and off three times.

The graph shows how the strength of the signal changed with time.



(a) (i) The graph shows a digital signal.

Explain what is meant by a digital signal.

(2)

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(ii) Suggest **two** ways that this signal could be made to carry more information.

(2)

1 .....

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2 .....

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(b) The frequency of Marconi's radio wave was 820 kHz and the wavelength was 366 m.

(i) State the equation linking wave speed, frequency and wavelength for radio waves.

(1)

(ii) Calculate the speed of the radio waves Marconi received.

(2)

Speed of radio waves = ..... m/s

(c) Some people do not believe that Marconi received 820 kHz radio waves.

They think that the frequency was really twice as much: 1640 kHz.

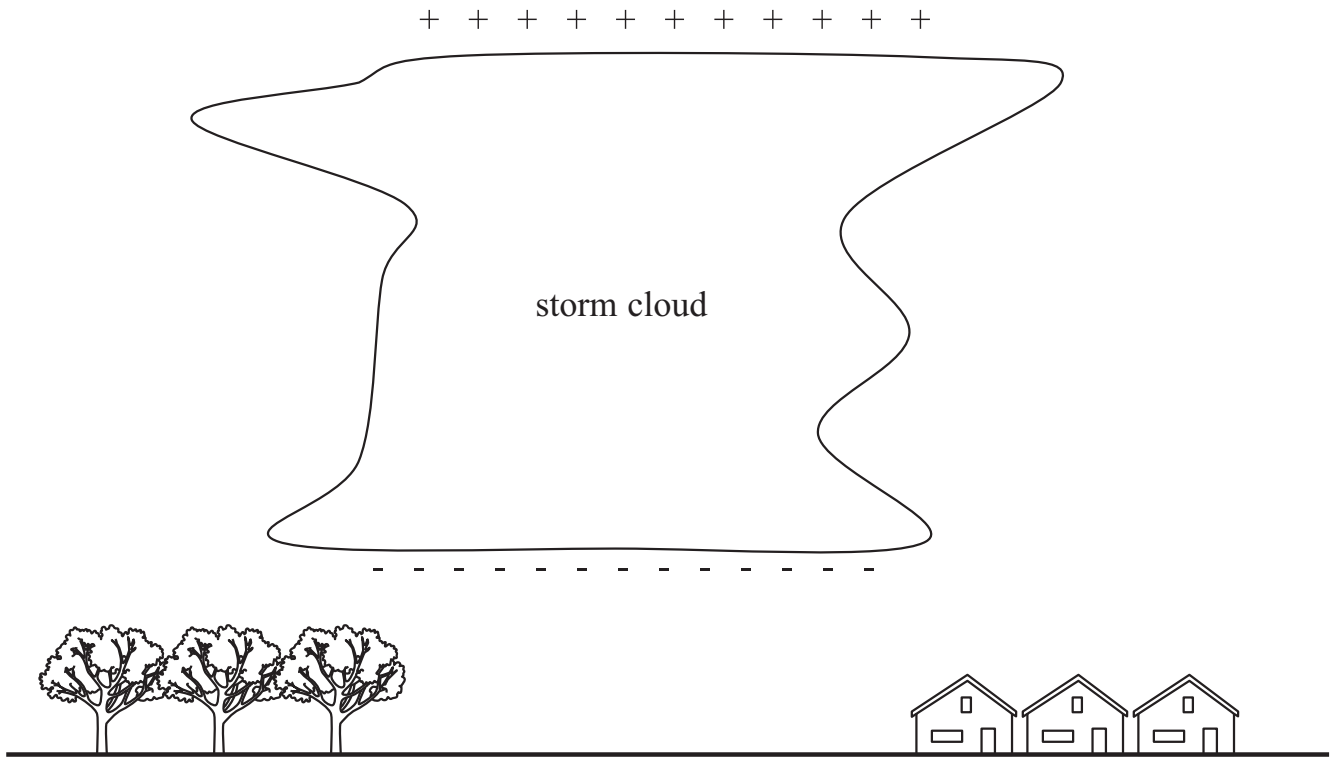
If these people are correct, what wavelength radio waves did Marconi receive?

(1)

Wavelength = ..... m

(d) Other people do not think Marconi received a radio signal across the Atlantic Ocean at all.

They think the radio waves he received were really caused by electrostatic discharges from storm clouds.



Explain what happens when a storm cloud discharges.

(3)

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**(Total for Question 3 = 11 marks)**

4. Some waves travel across the sea. They all have the same wavelength.

(a) What is meant by the term **wavelength**?

(1)

(b) The waves travel across the sea at 3.0 m/s and have a frequency of 1.5 Hz.

(i) State the equation linking wave speed, frequency and wavelength.

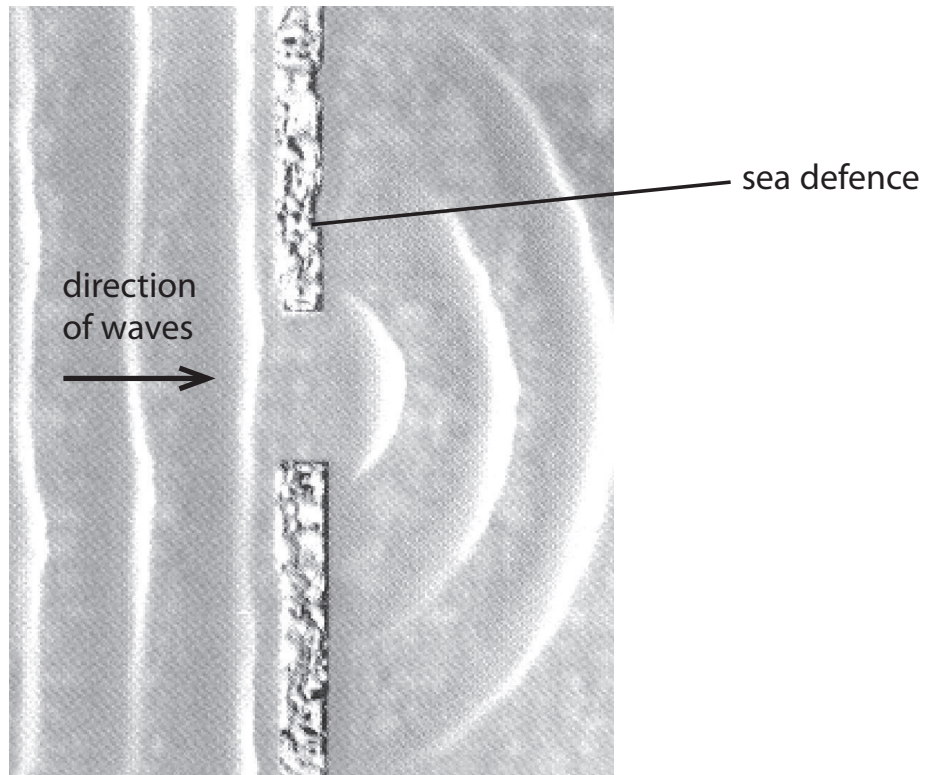
(1)

(ii) Calculate the wavelength of the waves.

wavelength ..... m

(2)

(c) This photograph was taken from an aeroplane. It shows a sea defence, with a gap in the sea wall.



Parallel waves pass through the sea defence at the gap in the sea wall, making the curved pattern shown in the photograph.



(i) Explain how this wave pattern is produced.

(2)

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(ii) Explain why light waves do not make a similar pattern as they pass through the same gap.

(2)

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**(Total for Question 4 = 8 marks)**

5. A signal generator produces sounds from a loudspeaker.

(a) (i) Which property of the sound wave should be increased in order to make the sound louder?

(1)

- A amplitude
- B frequency
- C speed
- D wavelength

(ii) Which property of the sound wave should be increased in order to make a higher pitched sound?

(1)

- A amplitude
- B frequency
- C speed
- D wavelength

(b) Sound waves travel as longitudinal waves.

Other waves are transverse.

(i) Give an example of a transverse wave.

(1)

(ii) Describe how the vibrations of longitudinal waves and transverse waves differ.

(2)

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**(Total for Question 5 = 5 marks)**