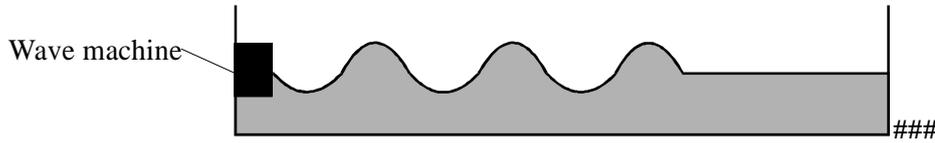


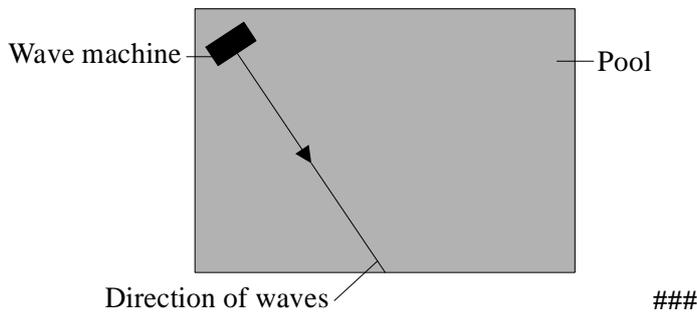
General properties of waves

1. (a) A swimming pool has a wave making machine. The diagram shows the water wave pattern for 3 seconds.



- (i) How many water waves are shown in the diagram?
 (1)
- (ii) What is the frequency of the water waves?
 (1)
- (iii) Which **one** of the units below is used to measure frequency? Underline your answer.
 hertz joule watt (1)

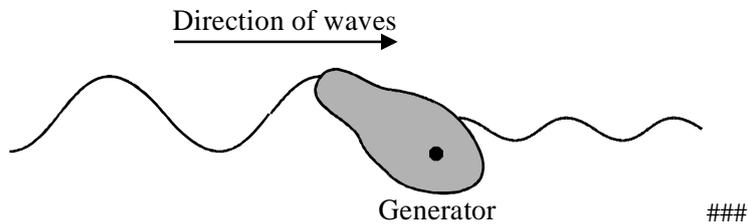
- (b) The diagram shows the direction of the waves across the pool. The waves reflect off the side of the pool.



Draw a line on the diagram to show the direction of the waves after they hit the side of the pool.

(1)

- (c) The swimming pool is used to test a model of an electricity generator. The waves make the floating generator move up and down. This energy is transferred to electricity.



In the following sentence, cross out the **two** lines that are wrong in the box.

The diagram shows that the amplitude of the waves gets larger
stays the same
gets smaller as the waves pass the generator.

(1)
(Total 5 marks)

2. Radio waves, ultra-violet, visible light and X-rays are all types of electromagnetic radiation.

- (a) Choose wavelengths from the list below to complete the table.

$3 \times 10^{-8} \text{ m}$ $1 \times 10^{-11} \text{ m}$ $5 \times 10^{-7} \text{ m}$ 1500 m

TYPE OF RADIATION	WAVELENGTH (m)
Radio waves	
Ultra-violet	
Visible light	
X-rays	

(4)

- (b) Microwaves are another type of electromagnetic radiation.

Calculate the frequency of microwaves of wavelength 3 cm.
(The velocity of electromagnetic waves is $3 \times 10^8 \text{ m/s}$.)

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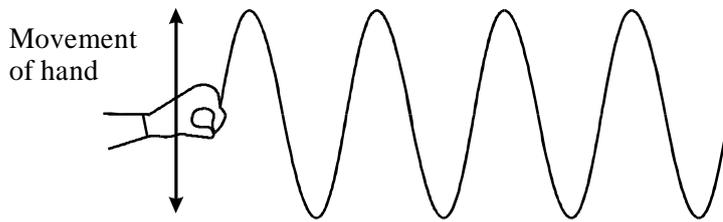
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(4)
(Total 8 marks)

3. The diagram shows a wave travelling along a rope.



- (a) On the diagram:
 - (i) show the wavelength and label it **W**;
 - (ii) show the amplitude and label it **A**.

(2)

(b) The wavelength of the wave is 0.1 m. Its frequency is 2 Hz.

Calculate the speed of the wave. Show clearly how you work out your answer and give the unit.

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.....
.....

Speed of wave

(3)
(Total 5 marks)