Name of the Student:_____

Max. Marks : 17 Marks **Time : 17 Minutes**

Q1.

A different water wave has a wavelength of 0.25 m and a frequency of 1.5 Hz.

Calculate the wave speed.

(2)

wave speed = ... m/s

(Total for question = 2 marks)

Q2.

Figure 1 shows part of a wave.

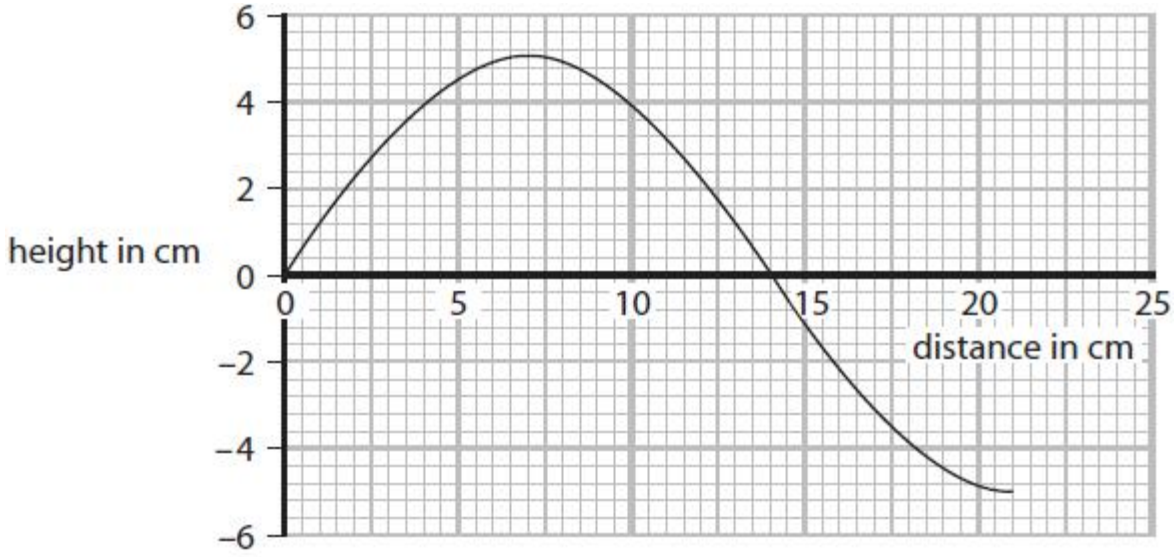

Figure 1

Use data from Figure 1 to calculate the wavelength of the wave.

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(2)

wavelength = ... cm

(Total for question = 2 marks)

Q3.

(i) A microwave oven uses waves of frequency 2.45 GHz.

Calculate the wavelength of the microwaves.
The velocity of light is 3.00×10^8 m/s.

(3)

wavelength = ... m

(ii) The microwave oven is 55% efficient and transfers 42 000 J of energy to some food when it is heated.

Calculate the total amount of energy that must be supplied to the oven.

(3)

energy supplied to oven = ... J

(Total for question = 6 marks)

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Q4.

Figure 1 shows a ripple tank.

This is used to study the behaviour of water waves.

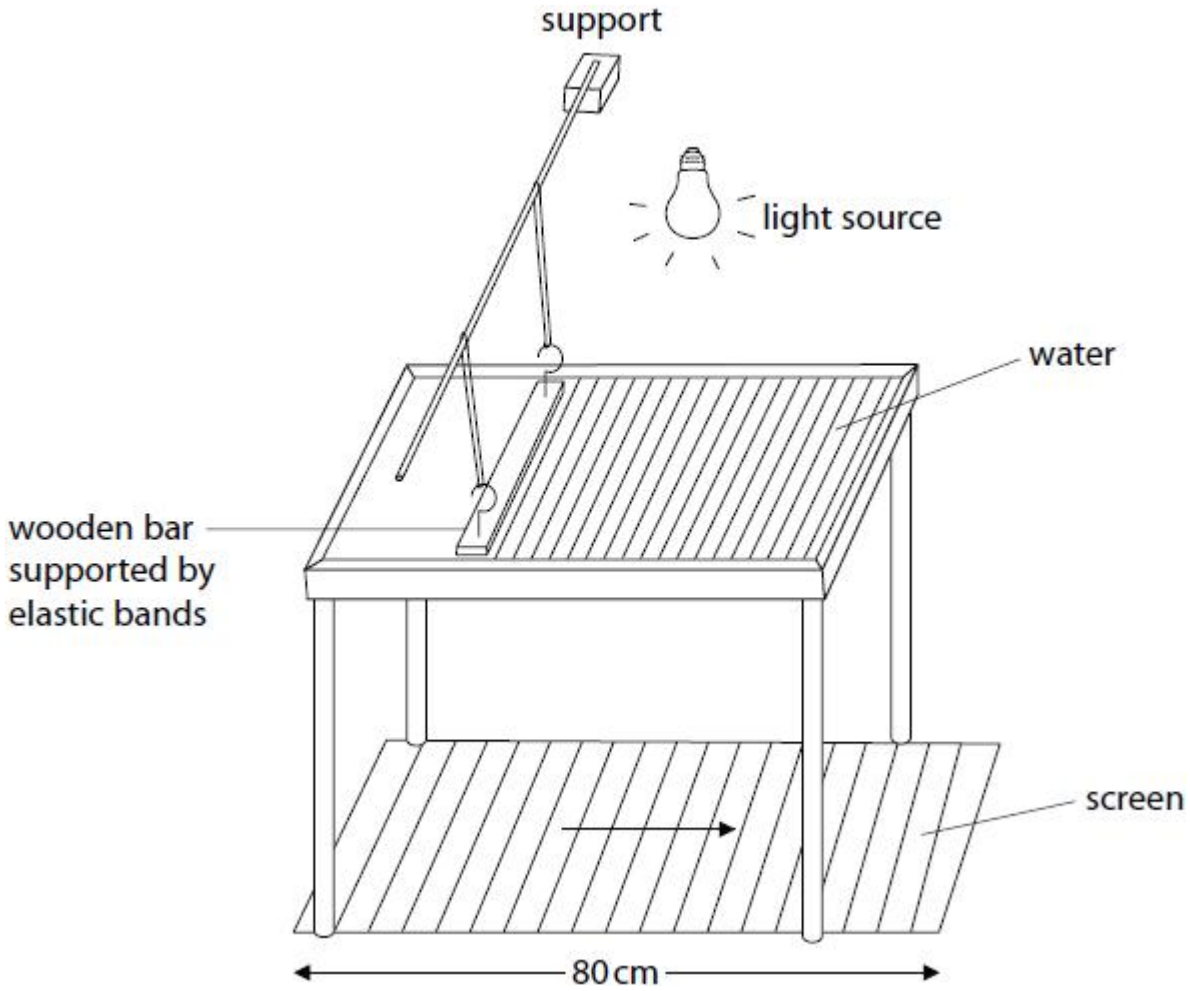

Figure 1

Water waves are produced in the tank.

The shadow of the waves is projected onto the screen below the tank.

The waves appear to move in the direction of the arrow.

(i) Describe how to determine the frequency of the waves.

(2)

.....

.....

.....

.....

(ii) The screen is 80 cm long.

What is the approximate wavelength of the waves as seen on the screen?

(1)

☒ **A** 4 cm

☒ **B** 8 cm

☒ **C** 40 cm

☒ **D** 80 cm

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(iii) A student uses the image to estimate the speed of the water wave as 75 cm/s.

Which of these is a reason why the estimate is not correct?

(1)

- ☒ **A** the student used a ruler without mm markings
- ☒ **B** the light was not bright enough
- ☒ **C** the student's measurement was inaccurate
- ☒ **D** the wave seen on the screen is magnified

(Total for question = 4 marks)

Q5.

A class is learning about refraction of waves.
The teacher shows them a demonstration using a battery-powered toy car travelling across a smooth road and onto some sand.
The car slows down as it enters the sand.

Figure 4 shows the car just before it meets the sand.

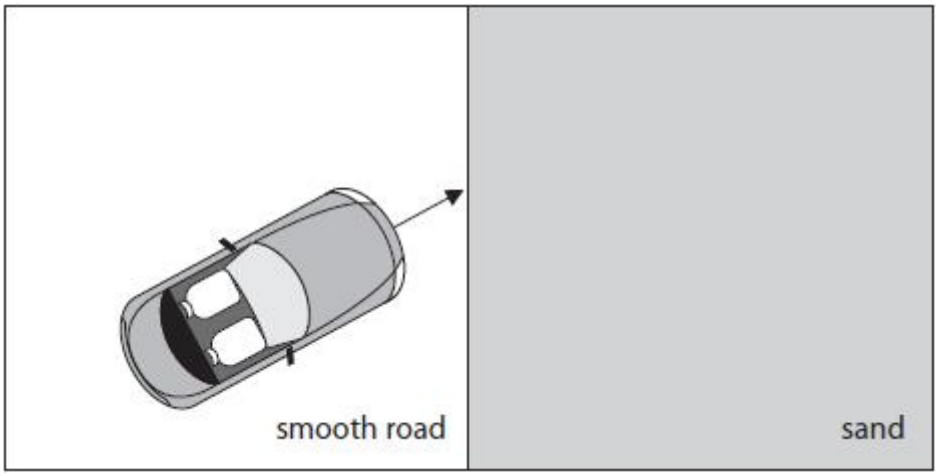

Figure 4

(i) Draw an arrow on the diagram to show the direction of the car as it travels across the sand.

(1)

(ii) Explain why this is a useful model for refraction of light.

(2)

.....

.....

.....

.....

(Total for question = 3 marks)

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