

1 Waves can be either transverse or longitudinal.

1 (a) (i) Describe the difference between longitudinal waves and transverse waves. **[3 marks]**

Transverse wave - the oscillation or vibration [1]

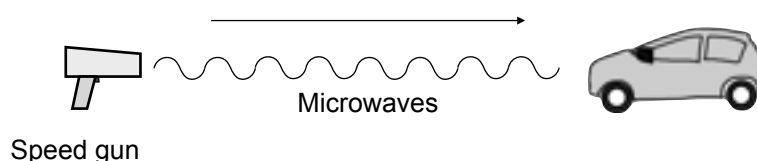
is perpendicular to the direction of energy transfer. [1]

Longitudinal wave - The oscillation or vibration [1]

is parallel to the direction of energy transfer. [1]

You can only get the mark for 'The oscillation or vibration' once.

1 (a) (ii) A speed gun is used to measure the speed of a moving car. The gun emits microwaves which are reflected off the car. Data about the microwaves are used to calculate the speed of the car.



The wavelength of the microwaves = 0.0125 m

Speed of microwaves = 300 000 000 m/s

Calculate the frequency of the microwaves.

Use the correct equation from the equation sheet.

Give the correct units.

300 000 000 / 0.0125 [1]

The correct equation is $v = f \times \lambda$, but needs rearranging. The equation sheet tells you that v stands for speed in this case!

[2 marks]

Frequency = 24 000 000 000 Hz or 24 000 MHz [2]

1 (b) Calculate the wavelength of a radio wave travelling at 300 000 000 m/s and has frequency of 200 kHz.

Use the correct equation from the equation sheet to help you.

[2 marks]

300 000 000 / 200 000 [1]

Wavelength = 1500 [2] m

The correct equation is $v = f \times \lambda$, but needs rearranging. The tricky bit for the second question is that the frequency is in kHz and needs to be converted to Hz by multiplying by 1000.

(Total 7 marks)

End

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