Name of the Student:_____
Max. Marks : 27 Marks **Time : 27 Minutes**

Q1.

A student used a ray box to shine a ray of light through air into a glass block.

The student investigated how the angle of refraction varied with the angle of incidence.

The table below shows the results.

Angle of incidence in degrees	Angle of refraction in degrees
10	5
20	10
30	14
40	19
50	23
60	26
70	28
80	29

(a) Describe a method the student could have used to obtain the results in above table.

Your answer may include a labelled diagram.

_____

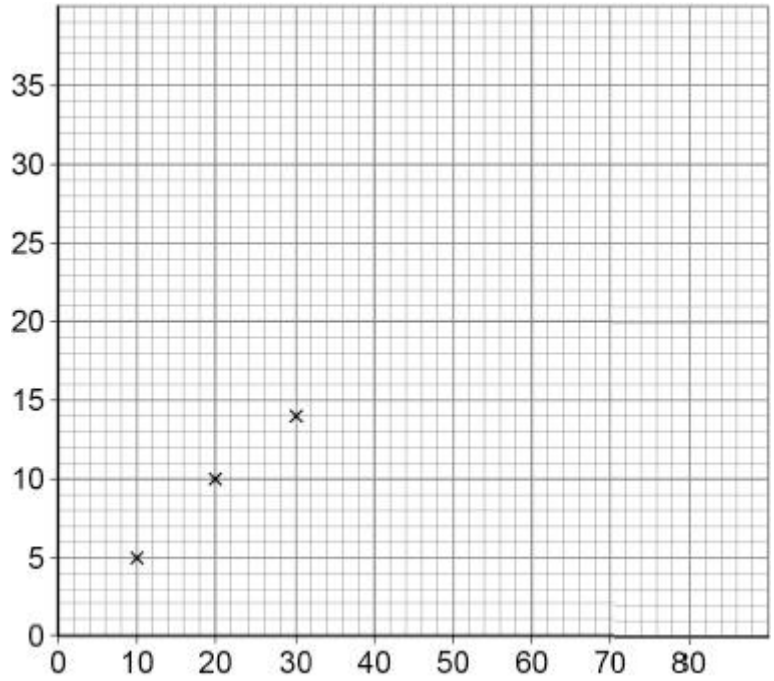
_____

_____

(6)

(b) **Figure 1** is an incomplete graph of the results.

Figure 1



Complete **Figure 1** using data from above table.

- Label the axes.
- Plot the remaining data.
- Draw a line of best fit.

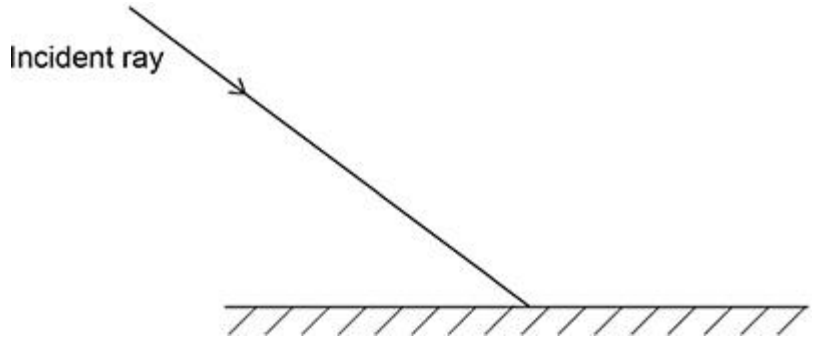
(4)

(c) Complete the ray diagram in **Figure 2** to show the reflection of light from the surface of a plane mirror.

You should:

- draw the normal line
- draw the reflected ray.

Figure 2

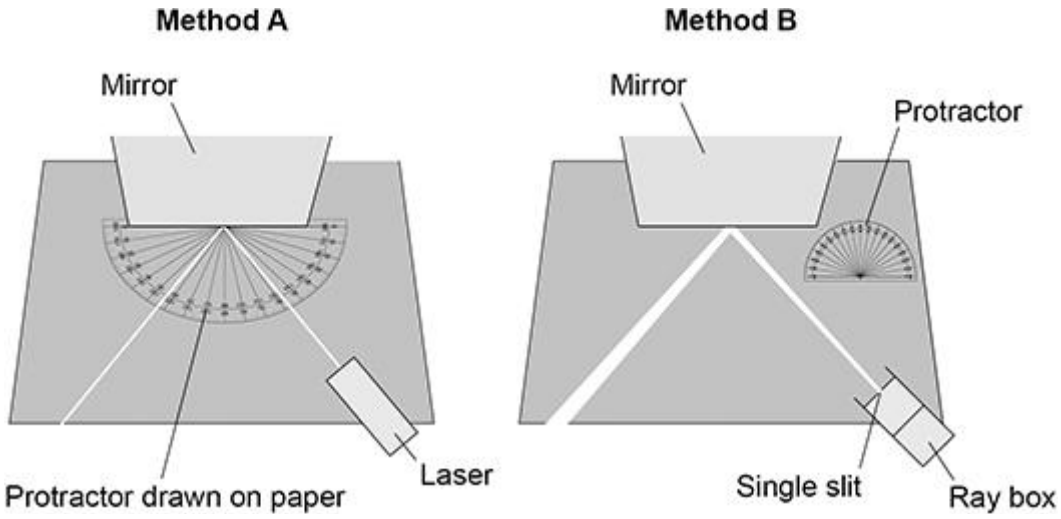


(2)

(d) Two students investigated the reflection of light by a plane mirror.

Figure 3 shows the different equipment the students used.

Figure 3



Explain **two** ways that **Method A** is better than **Method B**.

1. _____

_____

_____

_____

2. _____

_____

_____

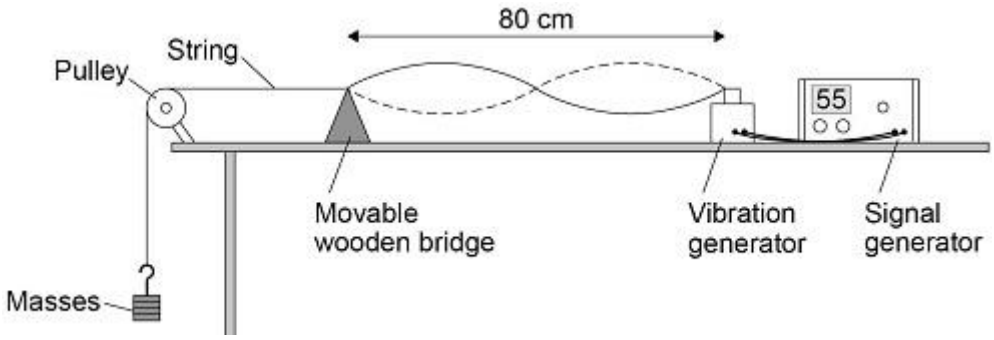
_____

(4)

(Total 16 marks)

Q2.

The following figure shows the apparatus used to investigate the waves in a stretched string.



The frequency of the signal generator is adjusted so that the wave shown in the figure is seen.

At this frequency the string vibrates between the two positions shown in the figure.

(a) The wavelength of the wave shown in the figure above was measured as 80 cm

What piece of apparatus would have been suitable for measuring this wavelength?

_____

(1)

(b) Write down the equation which links frequency, wavelength and wave speed.

_____

(1)

(c) The string in the figure above vibrates at 55 Hz

Calculate the wave speed of the wave shown in the figure.

Use data given in the figure.

_____

_____

_____

Wave speed = _____ m/s

(3)

(d) The frequency of the signal generator is increased.

This makes the wavelength of the wave change.

The wave speed stays the same.

Describe how the apparatus could be adjusted to show one complete wave without reducing the frequency.

_____

_____

_____

_____

(2)

(e) A student wants to investigate how the speed of a wave on a stretched string depends on the tension in the string.

The student uses the apparatus in the figure above.

Describe a method the student could use for this investigation.

_____

_____

_____

_____

_____

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_____

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_____

_____

_____

_____

(4)
(Total 11 marks)