Applications of light and sound

1 Diagram 1 shows a glass prism which can be used to turn an image the right way up.

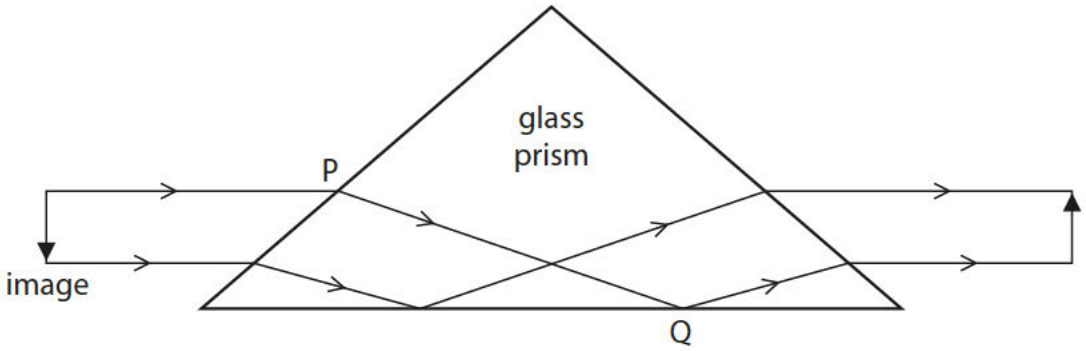


Diagram 1

(a) (i) In diagram 1, total internal reflection occurs at Q.
Explain why total internal reflection occurs at Q.

(2)

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(ii) The way in which the light changes direction at P is shown in diagram 2.

Mark on the diagram (*i*) for the angle of incidence and (*r*) for the angle of refraction for the ray of light shown.

(2)

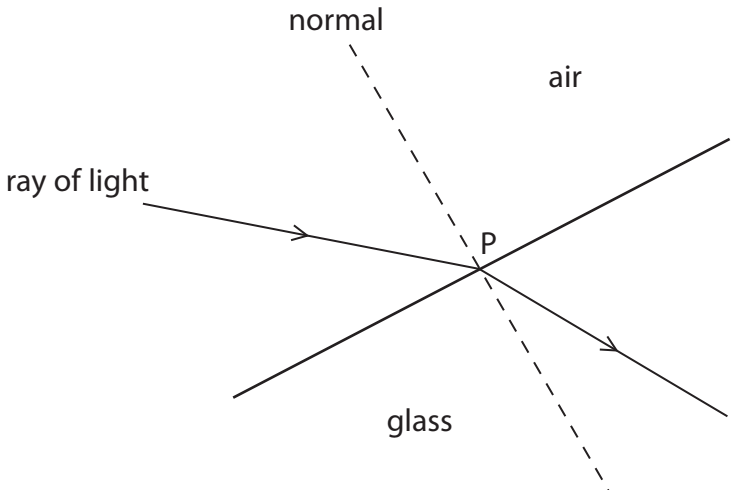


Diagram 2

(iii) Which of these is correct for the light as it enters the prism at P?

Put a cross (☒) in the box next to your answer.

(1)

☒ **A** frequency decreases

☒ **B** frequency increases

☒ **C** speed decreases

☒ **D** speed increases

(b) Light waves and sound waves are both used in the diagnosis and treatment of medical conditions

(i) A doctor uses an endoscope to look inside the body of a patient.

Explain how optical fibres are used in endoscopes.
You may draw a labelled diagram to help with your answer.

(3)

(ii) Describe how ultrasound can be used as a medical treatment for illness or injury.

(2)

(Total for Question 3 = 10 marks)