

## Applications of light and sound

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

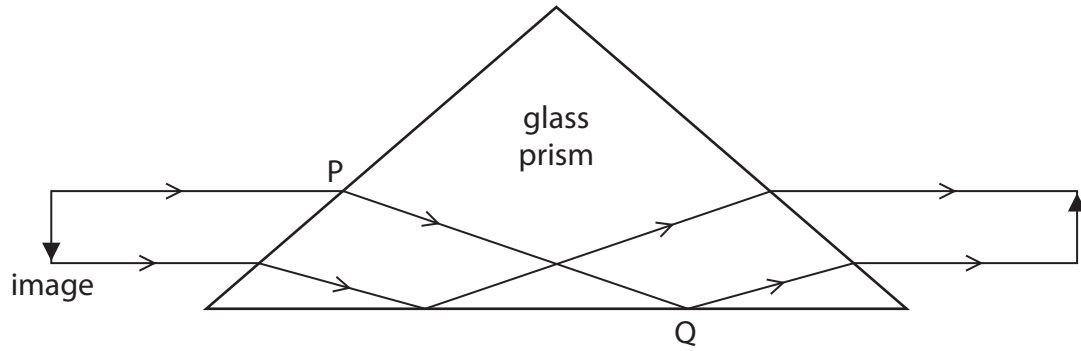


Diagram 1

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

(2)

.....

.....

.....

.....

(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)

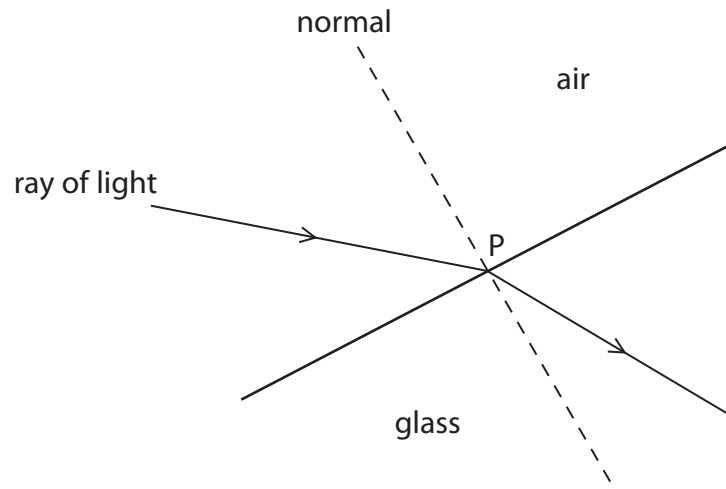


Diagram 2

(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)**