Light

Question Paper

Course	CIE IGCSE Physics
Section	3. Waves
Topic	Light
Difficulty	Hard

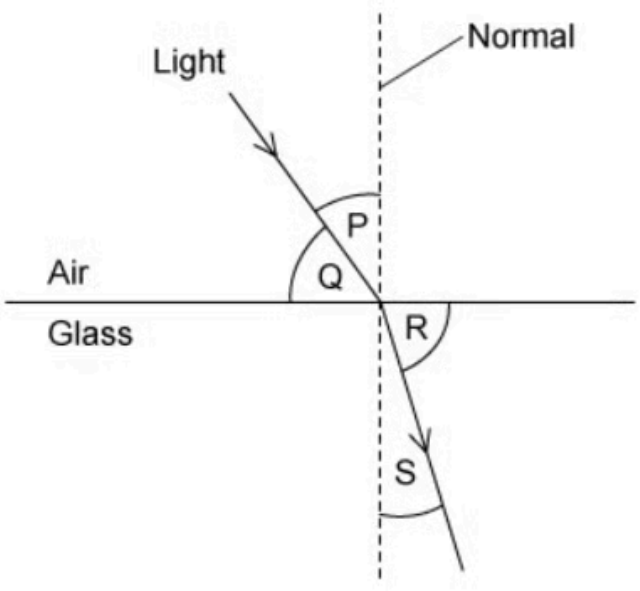
Time Allowed 10

Score /7

Percentage /100

Question 1

The diagram shows light passing from air into glass. A number of angles have been labelled on the diagram.



Which of the equations could be used to correctly calculate the refractive index, *n*, of the glass?

A. $\frac{\sin P}{\sin S}$

B. $\frac{\sin Q}{\sin R}$

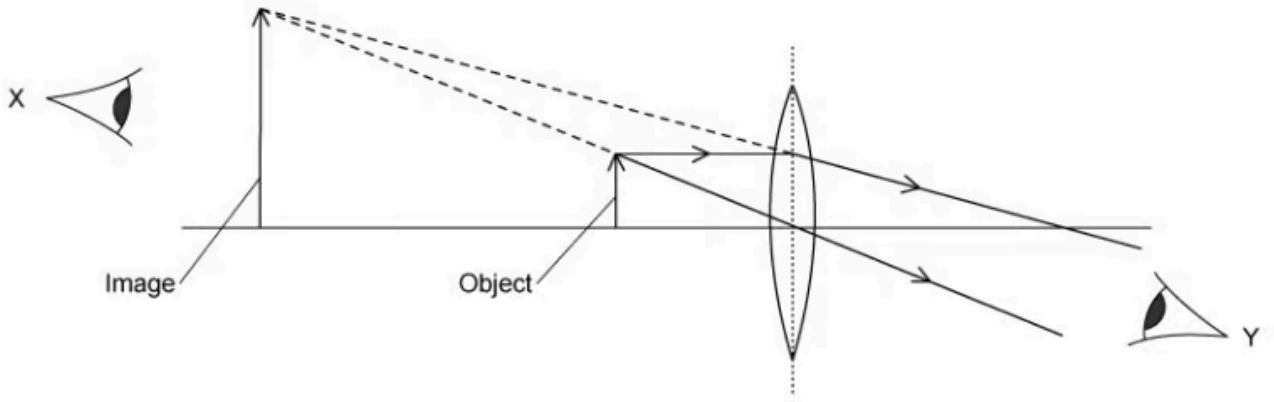
C. $\frac{\sin P}{\sin R}$

D. $\frac{\sin Q}{\sin S}$

[1 mark]

Question 2

Below is a ray diagram showing the image formed by a thin, converging lens.



Which of the following statements about the image is correct?

A. The image is virtual and can be seen by eye Y.

B. The image is inverted and can be seen by eye Y.

C. The image is real and can be seen by the eye at X.

D. The image is virtual and can be seen by eye X.

[1 mark]

Question 3

Light enters a flat water surface at an angle of 27 °.

The refractive index of water is 1.33.

At what angle does the light ray refract?

A. 0.34 °

B. 20.3 °

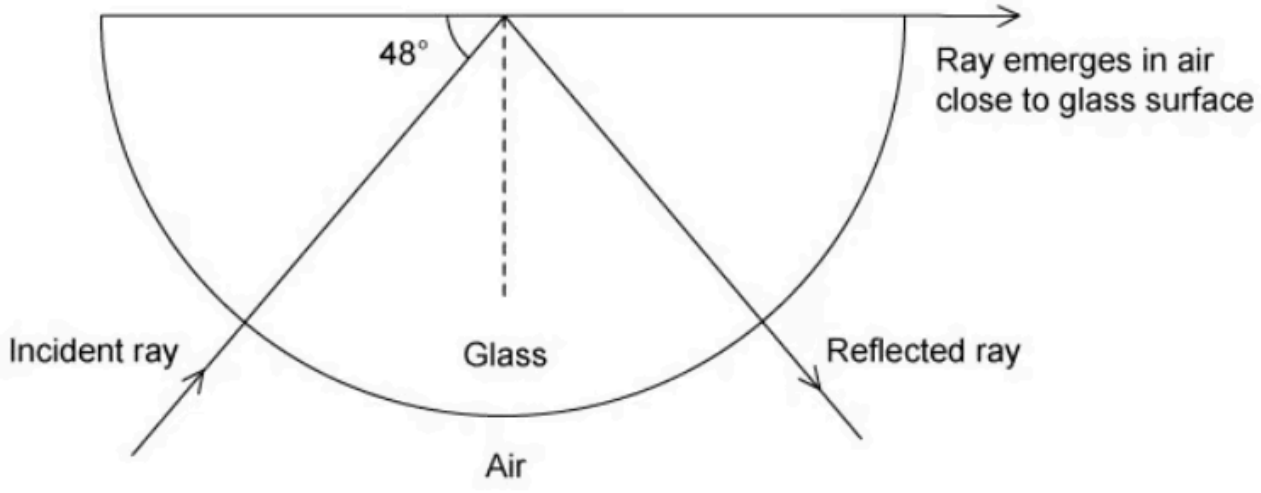
C. 20.0 °

D. 37.0 °

[1 mark]

Question 4

A ray of light is shone into a semi-circular glass block so that it makes an angle of 48° with the rear, flat edge of the block as shown.



Calculate the refractive index of the glass.

A. 0.023

B. 1.49

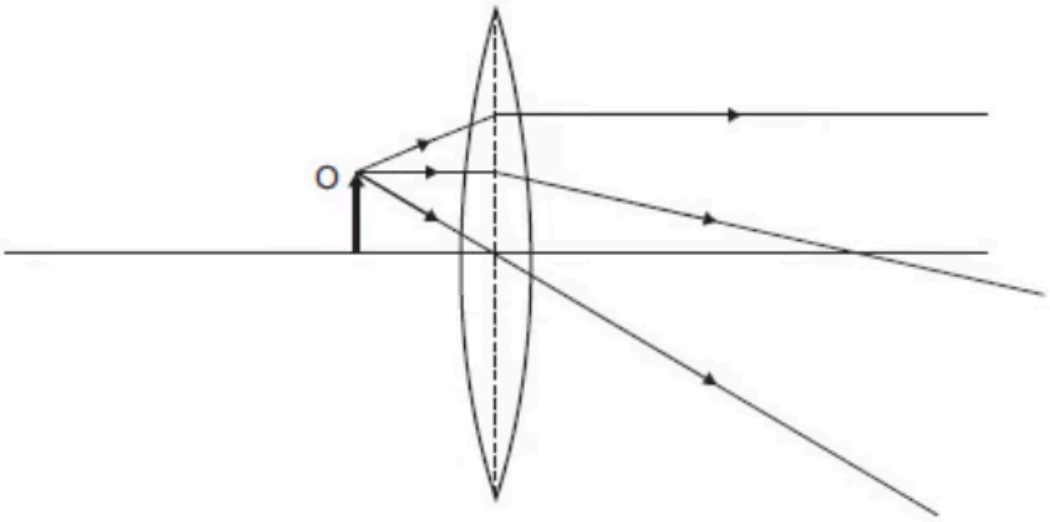
C. 2.38

D. 1.35

[1 mark]

Question 5

The diagram shows an object positioned close to a thin converging lens (inside the focal distance). Three light rays are shown leaving the object and passing through the lens.



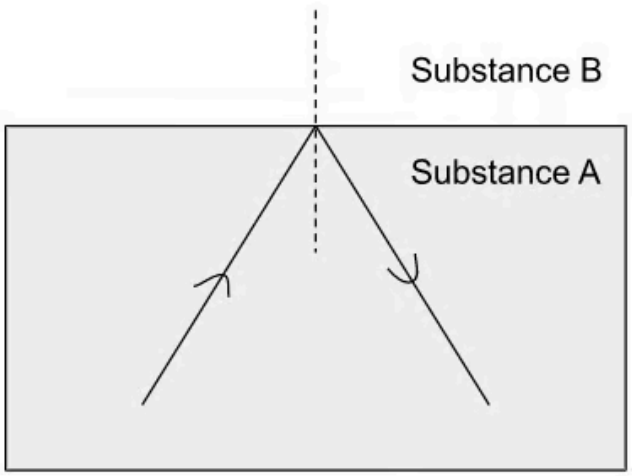
Which row in the table correctly describes the properties of the image?

	location	size	real / virtual
A	to the left of O	reduced	real
B	to the right of O	enlarged	virtual
C	to the left of O	enlarged	virtual
D	at O	the same as O	real

[1 mark]

Question 6

The diagram shows a ray of light being totally internally reflected at the boundary between substances A and B.



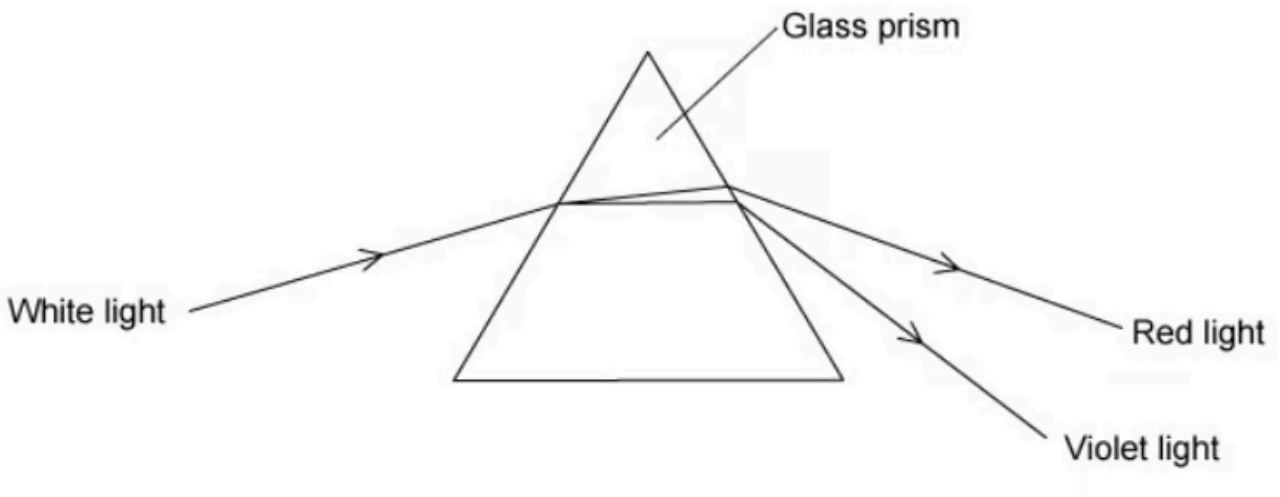
Which row in the table must be true?

	Angle of incidence	Substance A
A	greater than critical angle	greater refractive index than B
B	greater than critical angle	smaller refractive index than B
C	less than critical angle	greater refractive index than B
D	less than critical angle	smaller refractive index than B

[1 mark]

Question 7

The image below shows white light being split into its constituent colours by a glass prism.



Why does a prism cause white light to be dispersed?

A. Light towards the red end of the spectrum slows down less than light towards the violet end of the spectrum as it moves through the glass

B. Light towards the red end of the spectrum slows down more than light towards the violet end of the spectrum as it moves through the glass

C. The frequency of the light towards the red end decreases more than the frequency of light towards the violet end of the spectrum

D. The frequency of the light towards the violet end decreases more than the frequency of light towards the red end of the spectrum

[1 mark]