

# The Eye

## Question Paper

Level	GCSE
Subject	Physics
Exam Board	AQA
Unit	P3
Topic	The Eye
Difficulty Level	Gold Level
Booklet	Question Paper

**Time Allowed:** 16 minutes

**Score:** /16

**Percentage:** /100

Q1.(a) Human eyes and digital cameras both have parts with the same function.

Complete the missing parts in the table below.

Details of part	Part of eye	Part of digital camera
Refracts light to produce an image	Cornea and lens	Lens
Images are focused here	Retina	.....
Variable opening where light enters	.....	Aperture

(2)

(b) Long sight is a defect of the human eye.

State **two** causes of long sight.

1 .....

.....

2 .....

.....

(2)

(c) Long sight can be corrected by wearing spectacles with converging (convex) lenses.

A lens in these spectacles has a power of +3.2 dioptres.

Calculate the focal length of this lens.

Use the correct equation from the Physics Equations Sheet.

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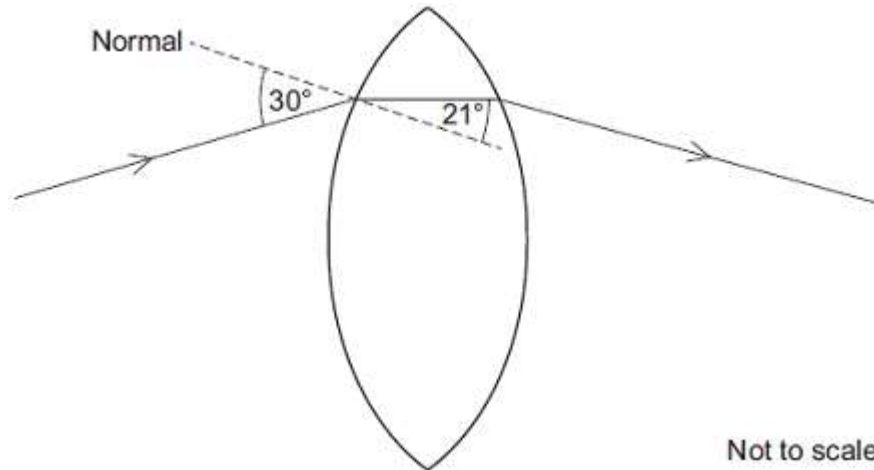
.....

.....

Focal length = ..... metres

(2)

- (d) The figure below shows a ray of light passing through a converging (convex) lens.



- (i) Use the information in the figure above to calculate the refractive index of the glass used to make the lens.

Use the correct equation from the Physics Equations Sheet.

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.....  
.....  
.....

Refractive index = .....

(3)

- (ii) Different lenses of the same power can be made using glass of a different refractive index.

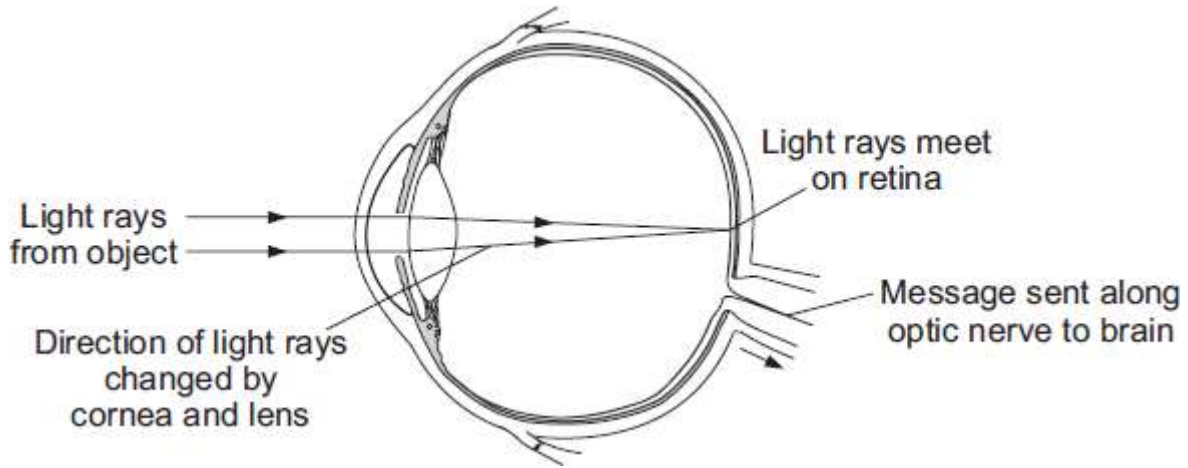
State **one** advantage of making spectacles using lenses made from glass of a higher refractive index.

.....  
.....

(1)

(Total 10 marks)

Q2. (a) The diagram shows the inside of the eye of a person with perfect vision.



Complete the sentence.

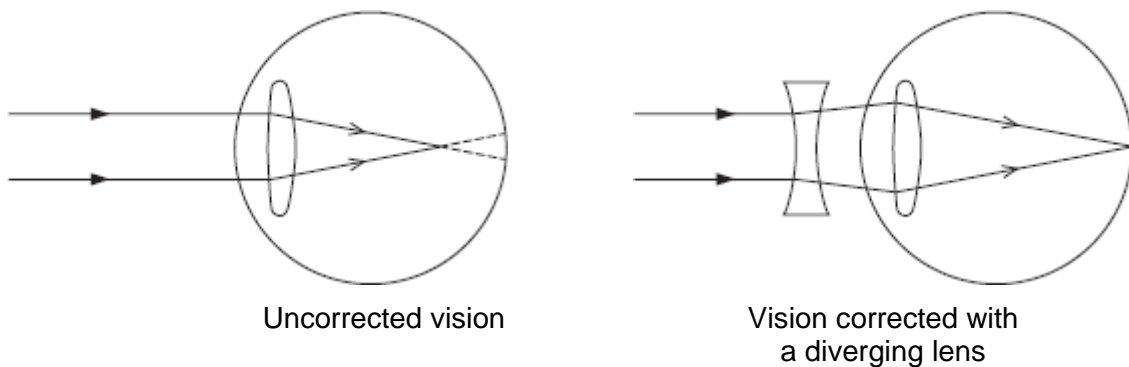
The process by which the cornea and lens change the direction of the light is called

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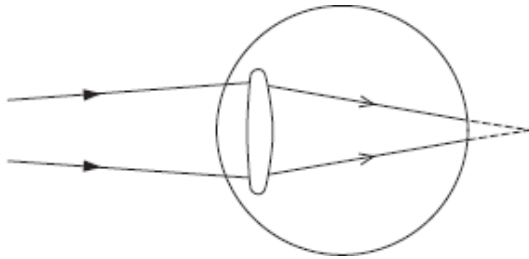
(1)

(b) (i) Not everyone has perfect vision. A **short-sighted** person can only clearly see objects which are close. Light from distant objects meets in front of the retina.

The diagrams show how an additional lens will correct **short-sightedness**.



The following diagram shows what happens when light from a close object enters the eye of a **long-sighted** person.



Light fails to come to focus on the retina

What type of additional lens will correct the vision of a **long-sighted** person?

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(1)

(ii) The additional lens changes the direction of the light before it enters the eye.

Why does this correct the person's vision?

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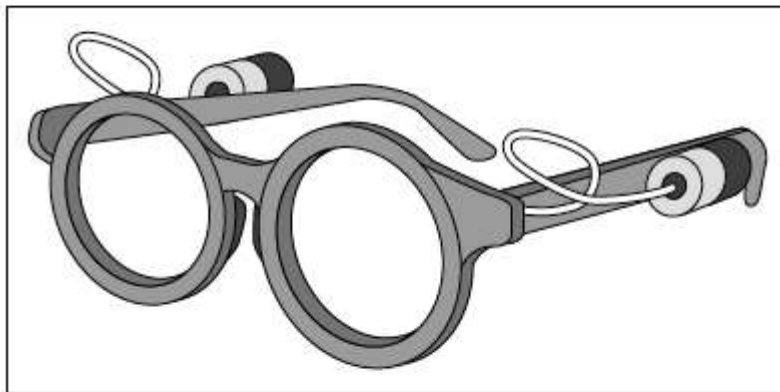
.....

(1)

(c) Read this passage from a magazine.

### Professor's clear vision for the future

There are billions of poor people in the world who cannot see clearly and cannot afford the cost of having their eyesight corrected. A professor has invented adjustable glasses. They are cheap and a few minutes is all it takes for you to adjust them to suit your eyes.



When the adjusting screw is turned in one direction, silicone is pushed into the flexible lens which becomes thicker in the centre. Turning the screw in the opposite direction pulls silicone out, and the lens becomes thinner at the centre than at the edge.

Explain how these glasses are adjusted for a **short-sighted** person and how this adjustment allows the person to see distant objects clearly.

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.....

.....

(3)  
(Total 6 marks)