

The Eye

Question Paper

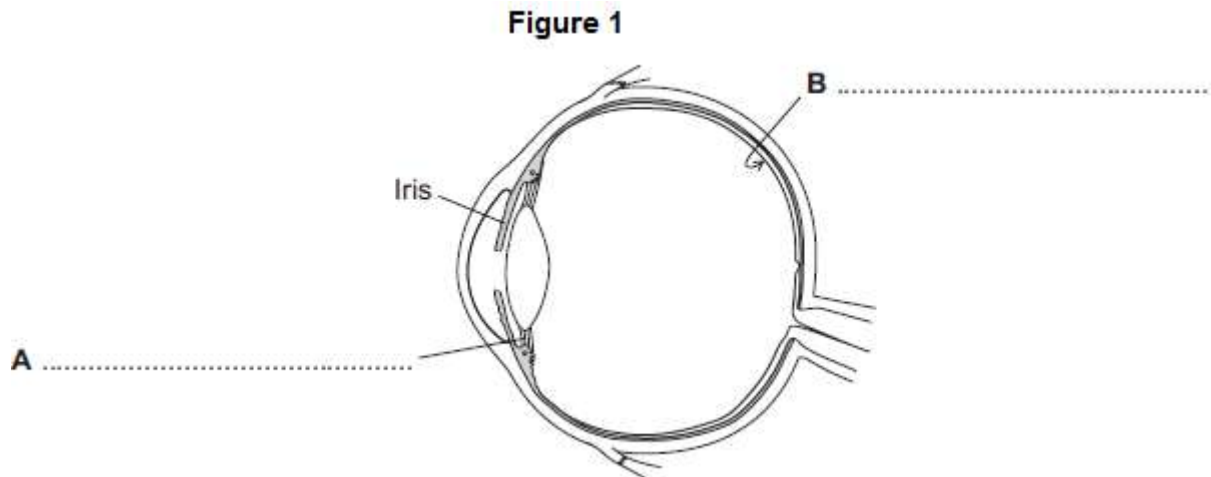
Level	GCSE
Subject	Physics
Exam Board	AQA
Unit	P3
Topic	The Eye
Difficulty Level	Silver Level
Booklet	Question Paper

Time Allowed: 37 minutes

Score: /37

Percentage: /100

Q1.(a) **Figure 1** shows a diagram of a human eye.



Label the parts **A** and **B** on **Figure 1**.

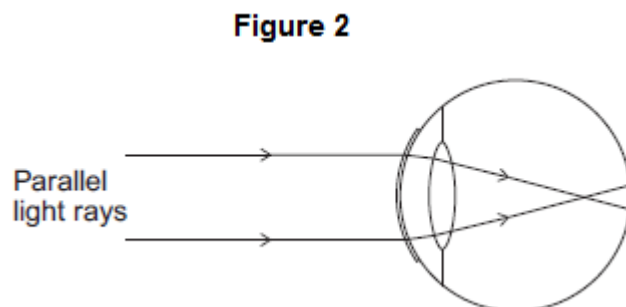
(2)

(b) State the function of the iris.

.....
.....

(1)

(c) **Figure 2** shows light rays travelling into the human eye.



(i) Give the name of the defect of vision shown in **Figure 2**.

.....

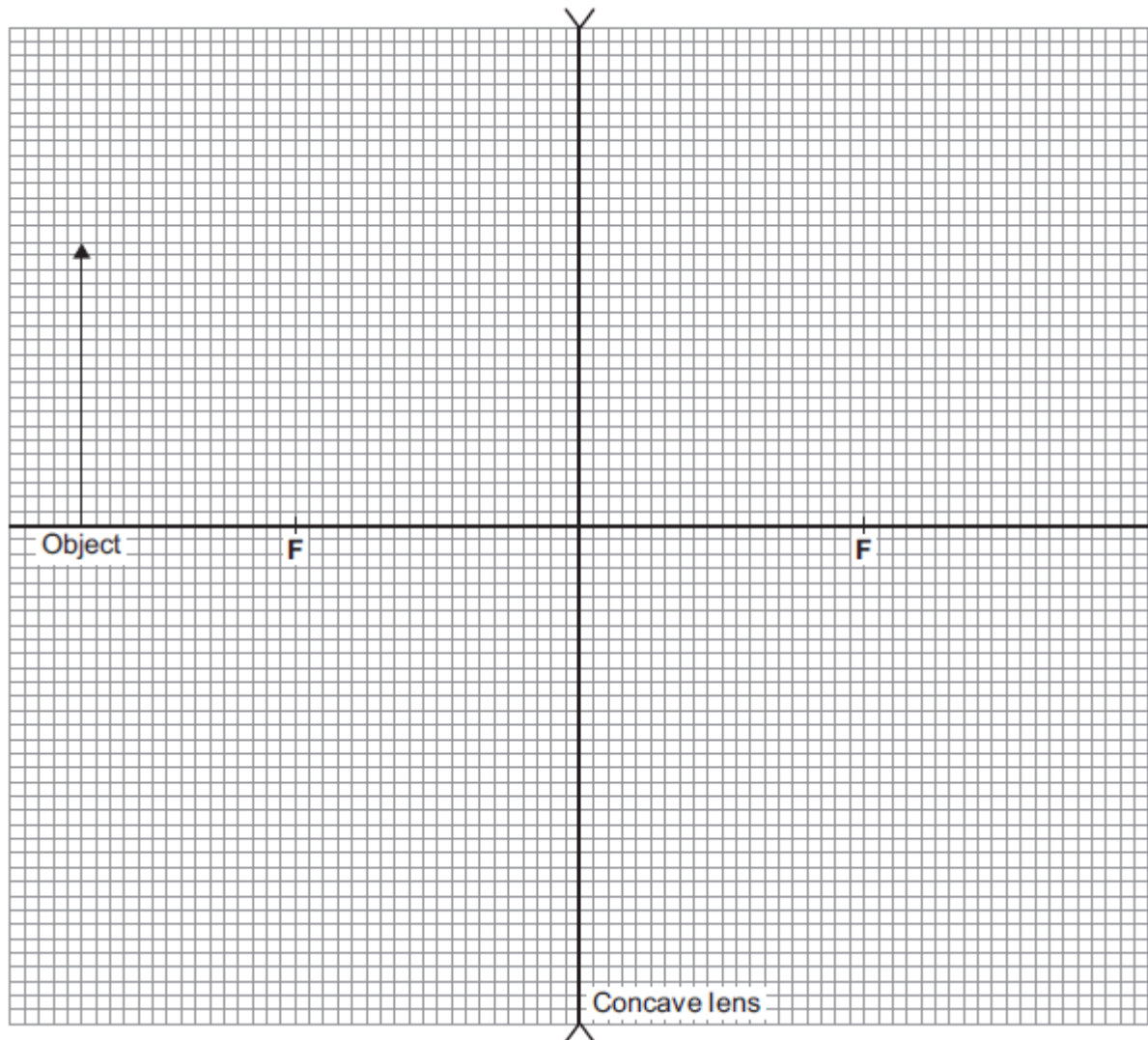
(1)

(ii) A concave (diverging) lens can be used to correct the defect of vision shown in **Figure 2**.

Complete the ray diagram in **Figure 3** to show how a concave lens produces an image of the object.

Use an arrow to represent the image.

Figure 3



(3)

(d) It is important that muscles can change the power of the lens in the eye. State why.

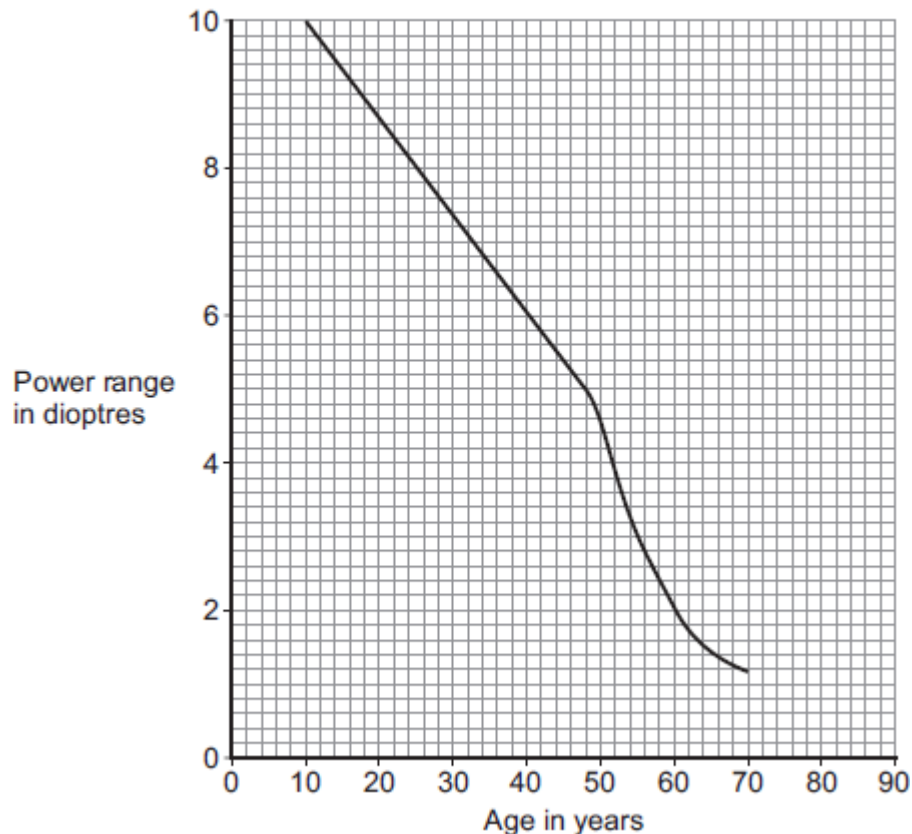
.....

(1)

(e) The 'power range' of an eye lens is the difference between the maximum and minimum power of the lens.

Figure 4 shows how the power range of an eye lens changes with age.

Figure 4



- (i) Use data from **Figure 4** to calculate the maximum change that can happen to the **focal length** of the eye lens for a 60-year-old person.

Use the correct equation from the Physics Equations Sheet.

Give the unit.

.....

Maximum change in focal length = unit

(2)

- (ii) Compare the change in power range of the eye lens between the ages of 10 and 30 with that between the ages of 50 and 70.

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(3)

(iii) Use **Figure 4** to suggest the power range of the eye lens for a 90-year-old person.

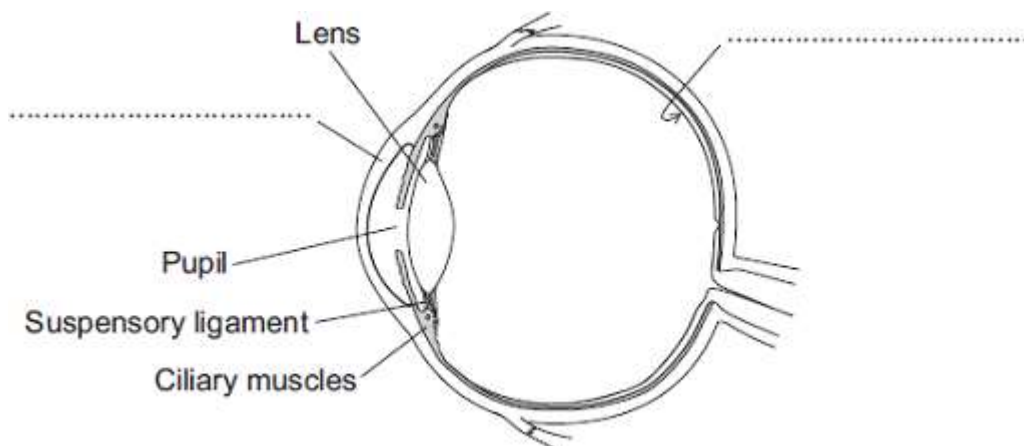
Power range = dioptries

(1)

(Total 14 marks)

Q2.(a) The diagram shows parts of the human eye.

Complete the missing labels.



(2)

(b) Each part of the human eye has a function.

Complete the table below.

Part of the human eye	Function of the part
	Changes size to make sure the correct amount of light

.....	enters the eye.
Ciliary muscles
Lens

(3)

- (c) The human eye can focus on near objects. The closest distance the eye can bring into sharp focus is called the near point.

A student measured the near point of four people of different ages. The table shows her data.

Age of human in years	Near point in millimetres
10	200
20	250
40	400
55	800

What can you conclude from the data in the table above?

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

(2)

(d) Suggest how the data obtained by the student could be improved.

.....
.....

(1)

(e) Spectacles are worn to correct vision. One of the lenses in a pair of spectacles has a focal length of 40 centimetres.

Calculate the power of the lens.

Use the correct equation from the Physics Equations Sheet.

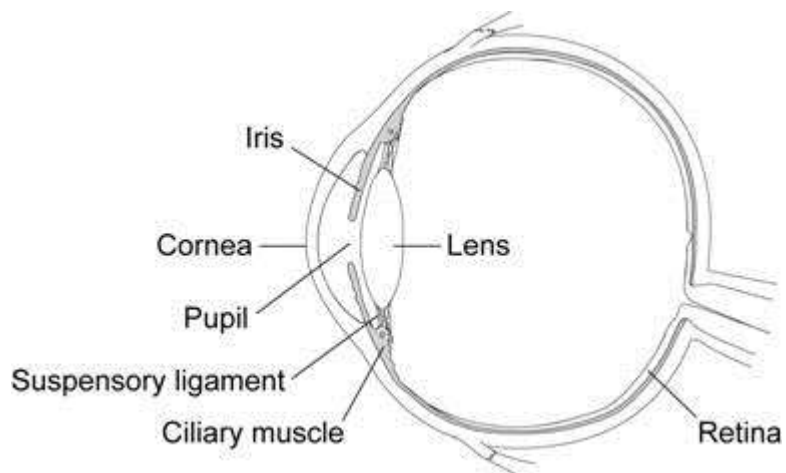
.....
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Power of lens = diopres

(2)

(Total 10 marks)

Q3. The diagram shows the cross-section of an eye.



(a) Use words from the box to complete each sentence.

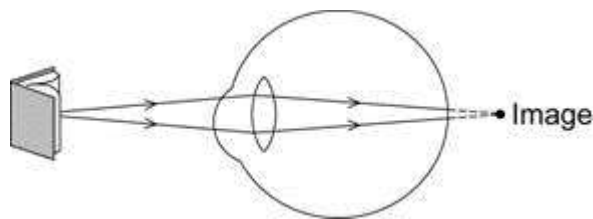
ciliary muscle	cornea	iris	pupil
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The shape of the lens is changed by the ,
 this allows the lens together with the to focus light
 onto the retina.

(2)

(b) A man, as he gets older, needs to hold a book further from his eyes in order to be able to see the writing clearly.

The diagram shows that his eye lens is not able to focus light on the retina.



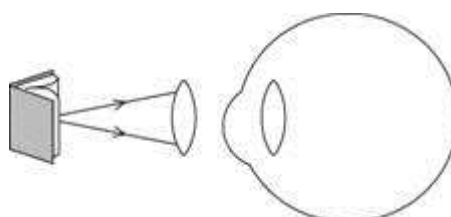
(i) How has the 'near point' of the man's eyes changed as he has got older?

.....

(1)

(ii) The problem can be solved by wearing reading glasses.

Complete the diagram below to show how the lens below is able to correct the man's vision.



(2)

(c) Give **two** similarities between an eye and a camera.

- 1
-
- 2
-

(2)
(Total 7 marks)

Q4. Lenses are used in many optical devices.

Complete the table below about the images formed by some optical devices.

OPTICAL DEVICE	NATURE OF IMAGE	SIZE OF IMAGE	POSITION OF IMAGE
Eye	real		
Projector		Magnified	
camera			Closer to lens than the object

(Total 6 marks)