

Questions

Q1.

The effect of age on focusing distance was investigated.

Volunteers of different ages had their eyes tested.

Each volunteer was asked to read words from a book. The book was moved closer to their eyes.

When the words became out of focus, the distance was recorded.

Figure 16 shows the results.

age of volunteers	distance (mm)			mean distance (mm)
	person 1	person 2	person 3	
40	256	261	257	258
45	282	275	280	279
50	292	301	297	?
55	311	309	307	309

Figure 16

(i) Calculate the mean distance for the volunteers aged 50.

Give your answer to three significant figures.

(3)

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(ii) Give one conclusion that can be made from the data in Figure 16.

(1)

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(iii) Give two improvements that are needed in this investigation before a valid conclusion can be made.

(2)

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(Total for question = 6 marks)

Q2.

Figure 10 shows the human eye.

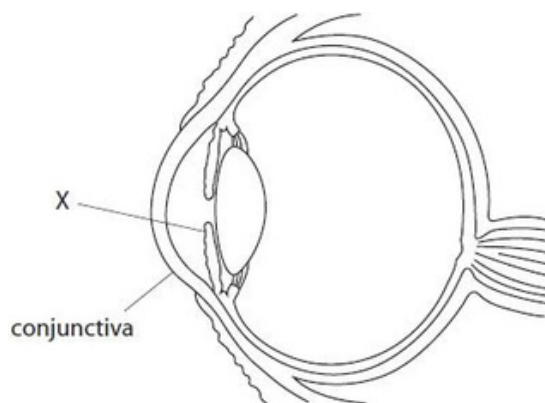


Figure 10

(a) (i) What is the part labelled X?

(1)

- A cornea
- B pupil
- C lens
- D iris

The conjunctiva is a membrane that covers the eyeball and inner surface of the eyelid.

(ii) Describe how the conjunctiva helps protect the eye from infection.

(2)

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Cataracts are caused by cloudy patches that develop on the lens. The chance of being affected by cataracts is related to age.

Figure 11 shows the percentage of people affected by cataracts in different age categories.

age category / years	percentage chance of being affected by cataracts (%)
0-14	3.8
15-44	6.5
45-59	30.7
> 60	59.0

Figure 11

(b) (i) Explain one conclusion that can be made about the occurrence of cataracts, using the data above.

(2)

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In a survey of one of the age categories, 80 people out of 256 showed signs of developing cataracts.

(ii) Calculate which age category the 256 people are most likely to be taken from.

(2)

Age category

The retina is a light receptor consisting of rod and cone cells.

(c) Describe how the information detected by the retina is transmitted to the brain.

(2)

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(Total for question = 9 marks)

Q3.

Figure 17 shows light rays entering the eye of a person with normal vision.

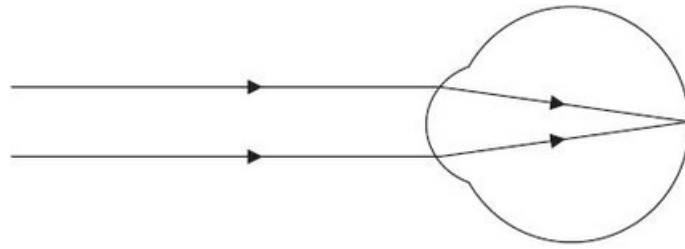


Figure 17

(i) Describe how light rays are focused to give normal vision.

(2)

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(ii) Figure 18 shows light rays entering the eye of a person with an eye defect and two lenses that can be used to correct eye defects.

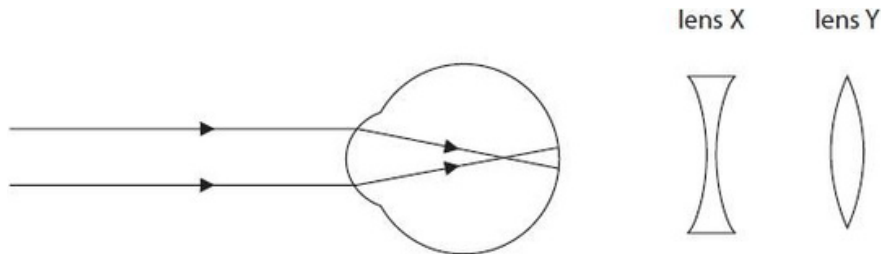


Figure 18

Explain which lens would correct the eye defect shown in Figure 18.

(2)

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(Total for question = 4 marks)

Q5.

Figure 4 shows a picture seen through healthy eyes and the same picture seen through eyes affected by cataracts.



picture seen through healthy eyes



picture seen through eyes with cataracts

Figure 4

Figure 5 shows the estimated number of people with cataracts in the world between 1980 and 2020.

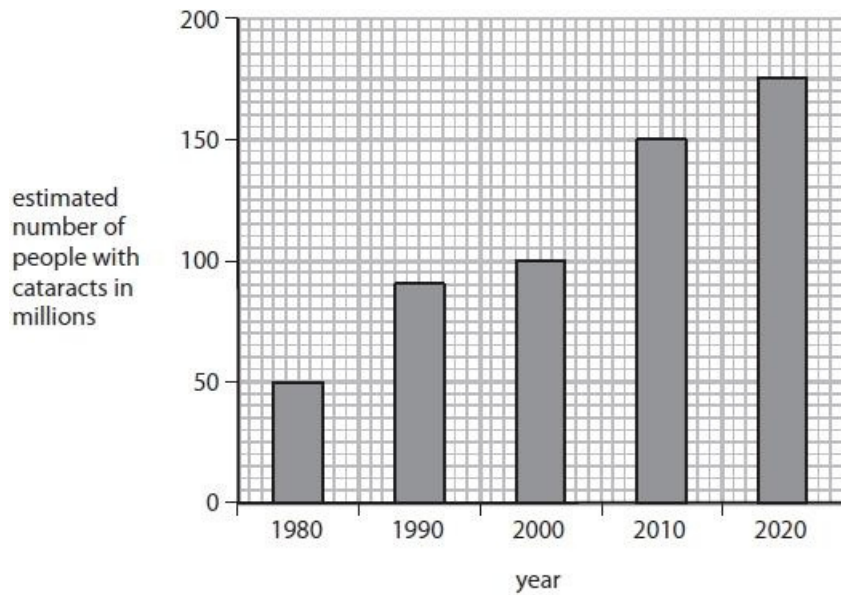


Figure 5

Describe the change in the estimated number of people with cataracts between 1980 and 2020.

(2)

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(Total for question = 2 marks)

Q6.

Figure 1 shows an eye.

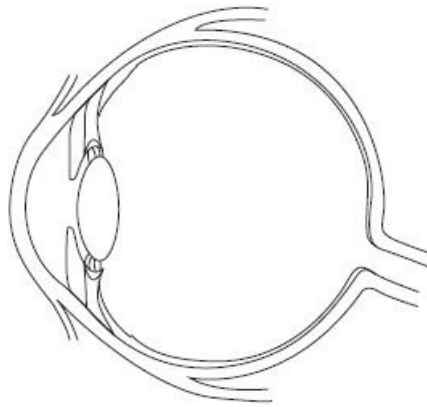


Figure 1

A student was given the hypothesis 'People with brown eyes are more likely to be short-sighted than people with blue eyes.'

Devise a plan to test this hypothesis.

(3)

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(Total for question = 3 marks)

Q7.

The UK driving test requires a person to be able to read a number plate at a distance of 20.5 metres.

Some people are short-sighted so cannot read the number plate at this distance.

Explain how a diverging lens corrects short-sightedness.

You may draw a diagram to help with your answer.

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(Total for question = 2 marks)

Q8.

Figure 4 shows a picture seen through healthy eyes and the same picture seen through eyes affected by cataracts.



picture seen through healthy eyes



picture seen through eyes with cataracts

Figure 4

(i) Explain how cataracts are currently treated.

(2)

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(ii) Scientists are developing a new treatment using eye drops for cataracts.

Describe the advantages of using eye drops to treat cataracts rather than the current treatment.

(2)

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(Total for question = 4 marks)

Q9.

(i) Explain how the size of the pupil of the eye changes when a torch is shone into the eye of a person.

(3)

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* (ii) Figure 15 shows a diagram of light entering an eye of someone who cannot see distant objects clearly.

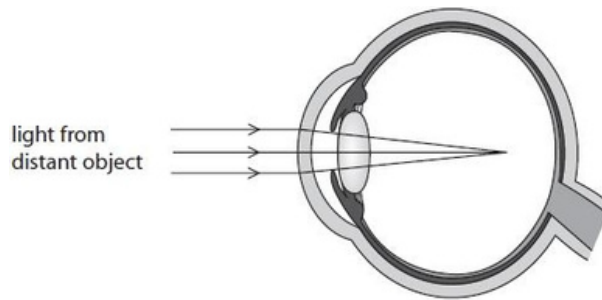


Figure 15

Explain why this person cannot see distant objects clearly and how the problem can be corrected.

(6)

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(Total for question = 9 marks)

Q10.

Explain the functions of the two types of cell in the retina that detect light.

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(Total for question = 4 marks)

Q11.

Answer the question with a cross in the box you think is correct . If you change your mind about an answer, put a line through the box and then mark your new answer with a cross .

Figure 1 shows a diagram of the human eye.

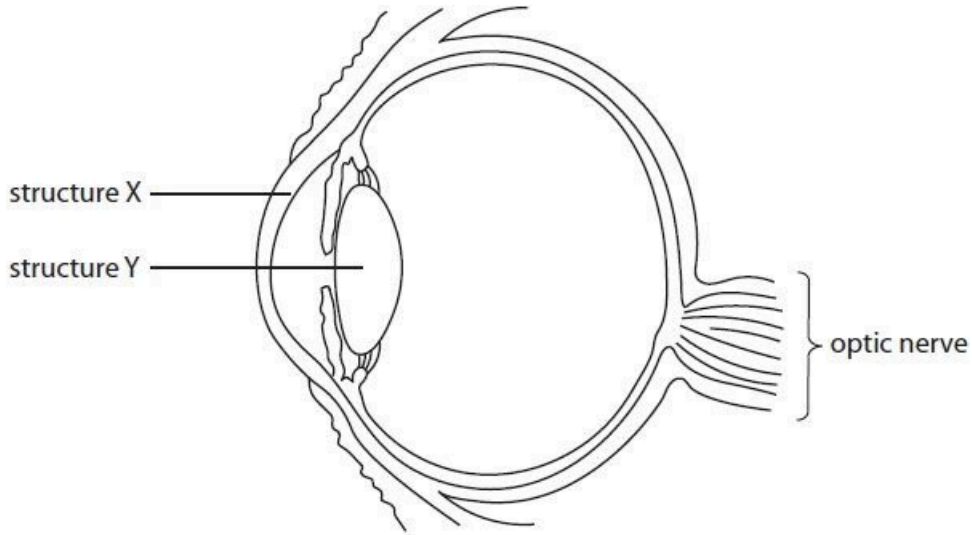


Figure 1

(i) Which row in the table gives the function of structure X and structure Y?

(1)

		function of structure X	function of structure Y
<input type="checkbox"/>	A	refracts light	detects light
<input checked="" type="checkbox"/>	B	detects light	refracts light
<input type="checkbox"/>	C	reflects light	detects light
<input checked="" type="checkbox"/>	D	refracts light	refracts light

(ii) Describe the changes that occur in the eye when a bright light is directed into the eye.

(2)

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(Total for question = 3 marks)

Q12.

Figure 4 shows a picture seen through healthy eyes and the same picture seen through eyes affected by cataracts.

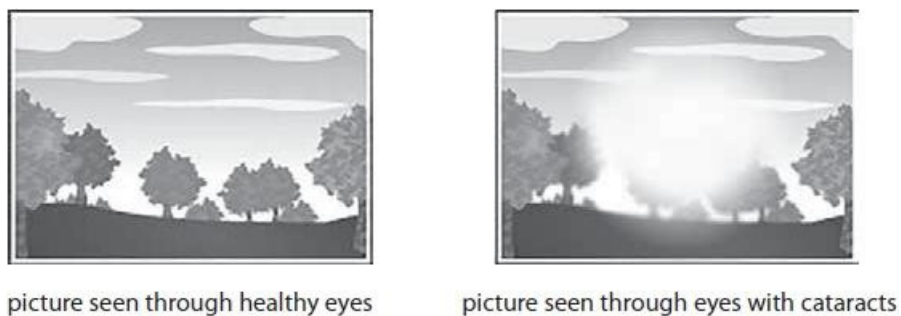


Figure 4

(i) In which part of the eye do cataracts form?

(1)

- A retina
- B iris
- C cornea
- D lens

(ii) Explain why the picture seen through eyes with cataracts is less clear.

(2)

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(Total for question = 3 marks)

Q13.

Answer the question with a cross in the box you think is correct . If you change your mind about an answer, put a line through the box and then mark your new answer with a cross .

(i) Which part of the eye carries impulses to the brain?

(1)

- A cornea
- B iris
- C lens
- D optic nerve

(ii) Name the structure within the eye that controls the amount of light entering the eye.

(1)

.....

(Total for question = 2 marks)

Q14.

Which part of the eye detects coloured light?

(1)

- A iris
- B lens
- C cones
- D cornea

(Total for question = 1 mark)

Q15.

Figure 8 shows a diagram of the human eye.

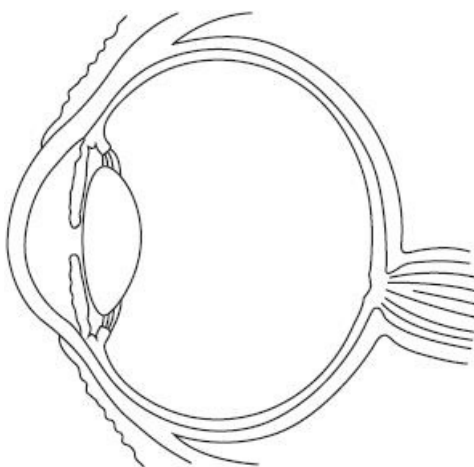


Figure 8

(i) Which structure of the eye contains the light receptor cells?

(1)

- A iris
- B lens
- C cornea
- D retina

(ii) The optic nerve transfers electrical signals from the eye to the central nervous system.

(1)

The optic nerve is a

- A relay neurone
- B motor neurone
- C sensory neurone
- D reflex neurone

(iii) Name the region of the central nervous system responsible for vision.

(1)

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(Total for question = 3 marks)

Q16.

Figure 18 shows two light receptor cells from the human eye.

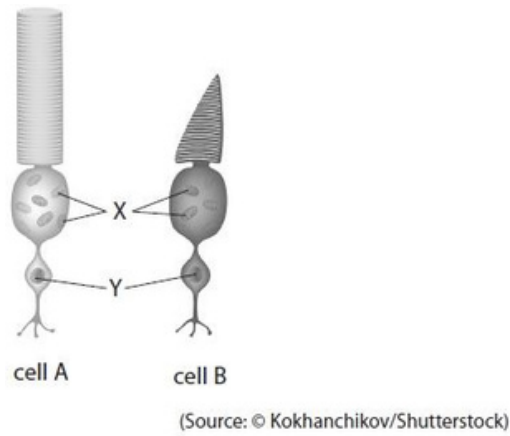


Figure 18

(i) Which part of the eye contains light receptor cells?

(1)

- A cornea
- B iris
- C lens
- D retina

(ii) These cells require energy.

The cell organelles labelled X release energy during respiration.
Name the organelles labelled X.

(1)

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(iii) The cell organelle labelled Y contains chromosomes.

Name the organelle labelled Y.

(1)

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(iv) Cell A responds to dim light and is responsible for night vision.

Name cell A.

(1)

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(v) Describe how the role of light receptor cell B is different from the role of light receptor cell A.

(2)

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(Total for question = 6 marks)

Q17.

The optic nerve carries information from the back of the eye to the brain.

The optic nerve is 47 mm in length.

Nerve impulses travel at 75 metres per second.

(i) Calculate the time an impulse takes to travel the length of the optic nerve.

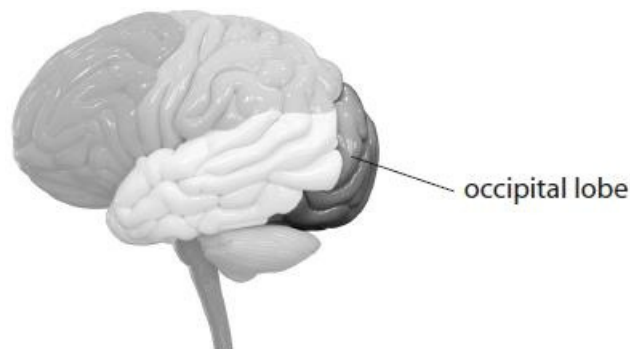
Use the equation: $\text{speed} = \frac{\text{distance}}{\text{time}}$

(3)

..... seconds

(ii) The impulse travels to the occipital lobe of the brain.

The occipital lobe is labelled in Figure 19.



(Source: © Magic mine/Shutterstock)

Figure 19

Which part of the brain contains the occipital lobe?

(1)

- A cerebral hemispheres
- B medulla oblongata
- C cerebellum
- D hypothalamus

(iii) State the sense most likely to be affected if the occipital lobe is damaged.

(1)

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(Total for question = 5 marks)

Q18.

Figure 14 shows a cross-section of a human eye.

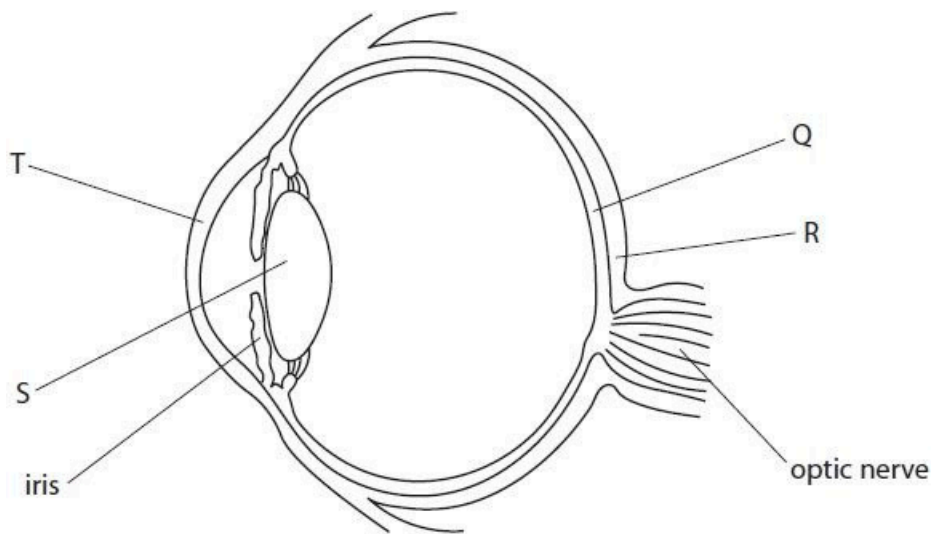


Figure 14

Cataracts can develop in the eye causing people to have blurred vision.

(i) Which structure of the eye can develop cataracts?

(1)

- A structure Q
- B structure R
- C structure S
- D structure T

(ii) Describe how cataracts are corrected by surgery.

(2)

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(Total for question = 3 marks)

Q19.

Figure 1 shows an eye.

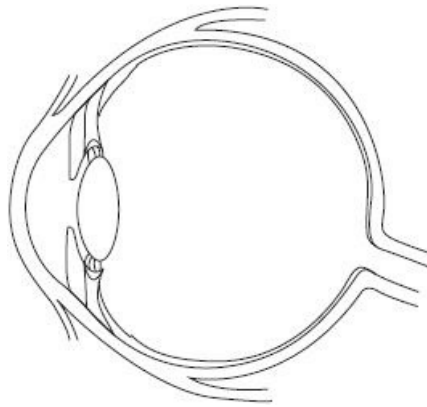


Figure 1

(i) When the eye changes from focusing on a distant object to focusing on a near object

(1)

- A the lens gets thinner to bend the light rays more
- B the lens gets thicker to bend the light rays more
- C the lens gets thinner to bend the light rays less
- D the lens gets thicker to bend the light rays less

(ii) Give a reason why people who are short-sighted cannot see distant objects clearly.

(1)

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.....

(iii) State the type of lens that can be used to correct short-sightedness.

(1)

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.....

(Total for question = 3 marks)

Mark Scheme

Q1.

Question number	Answer	Additional guidance	Mark
(i)	$(292 + 301 + 297) = 890$ (1) $(890 \div 3) = 296.7$ (1) given to 3 s.f. (1) 297	full marks for correct answer with no working ecf from mp1 allow 296.67 or answers correct to any number of decimal places for 2 marks including the dot to show recurring numbers ecf from mp2 accept 296 for 2 marks award 1 mark for 296.6/296.66	(3) AO2
Question number	Answer	Additional guidance	Mark
(ii)	Any one from: <ul style="list-style-type: none"> as age increases focusing distance increases /ORA (1) as age increases people {become more long-sighted / cannot see objects close up clearly} / ORA (1) different people of the same age have different focusing distances (1) 	accept a conclusion that links age group to a focus distance ignore cannot see objects in the distance	(1) AO3 2a

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Question number	Answer	Additional guidance	Mark
(iii)	<p>Any two from:</p> <ul style="list-style-type: none"> • use more people /repeat the test (with more people) (1) • use more ages (1) • repeat the test for each person (1) • controlling a variable in the people selected (1) • reference to no other eye defect / health issues (1) • controlling {external environment / test used} (1) 	<p>accept named variable e.g. sex</p> <p>ignore defects in distance vision</p> <p>accept named factors e.g. light levels / same book / same font</p>	<p>(2)</p> <p>AO3/3b</p>

Q2.

Question number	Answer	Mark
(a) (i)	D	(1)

Question number	Answer	Mark
(a) (ii)	<p>An answer that combines the following points of understanding to provide a logical description:</p> <ul style="list-style-type: none"> • (the conjunctiva)forms a physical barrier between the inside of the eye and the environment (1) • and the lysozyme on the conjunctiva kills micro-organisms that enter the eye (1) 	(2)

Question number	Answer	Mark
(b) (i)	<p>An explanation that combines identification via a judgement (1 mark) to reach a conclusion via justification/reasoning (1 mark):</p> <ul style="list-style-type: none"> • occurrence of cataracts increases with age (1) • manipulation of the data, e.g. doubles between 45-59 and > 60 (1) 	(2)

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Question number	Answer	Mark
(b) (ii)	$\frac{80}{256} \times 100 = 31\%$ (1) 45–59 category (1)	(2)

Question number	Answer	Mark
(c)	An answer that combines knowledge (1 mark) and understanding (1 mark) to provide a logical description: <ul style="list-style-type: none"> information is transmitted as an electrical signal (1) and the signal travels down a sensory neurone from the receptor to the brain/signal travels along the optic nerve (1) 	(2)

Q3.

Question number	Answer	Additional guidance	Mark
(i)	An answer including: <ul style="list-style-type: none"> light rays {refracted / bent} {at the cornea /by the lens} (1) (light rays) {converge / focus} on the retina / focal point is on the retina (1) 	reject for references to light going through/refracted by the iris accept (refracted) onto the retina accept rods / cones for retina ignore back of the eye/optic nerve	(2) AO1

Question number	Answer	Additional guidance	Mark
(ii)	<p>An explanation linking two from:</p> <ul style="list-style-type: none"> • lens X which is a {diverging/concave lens} (1) • {lens X/a diverging lens/a concave lens} will {diverge/spread} out the light rays (1) 	<p>accept a {concave /diverging} lens</p> <p>reject lens Y</p>	<p>(2)</p> <p>AO2</p>

Q4.

Question number	Indicative content	Mark
	<p>Short-sightedness</p> <ul style="list-style-type: none"> • eyeball too long • cornea too curved • lens too curved / too convex • light refracted too much by cornea / lens • light rays not brought to a focus on retina • light rays focused in front of retina <p>Long-sightedness</p> <ul style="list-style-type: none"> • eyeball too short • cornea not curved enough • lens too thin /not convex enough • light refracted too little by cornea / lens • light rays not brought to a focus on retina • light rays focused behind retina 	<p>(6)</p> <p>AO1 1</p> <p>AO2 1</p>

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Level	Mark	Descriptor
	0	<ul style="list-style-type: none"> No rewardable material.
Level 1	1-2	<ul style="list-style-type: none"> Demonstrates elements of biological understanding, some of which is inaccurate. Understanding of scientific, enquiry, techniques and procedures lacks detail. Presents a description which is not logically ordered and with significant gaps.
Level 2	3-4	<ul style="list-style-type: none"> Demonstrates biological understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas, enquiry, techniques and procedures is not fully detailed and/or developed. Presents a description of the procedure that has a structure which is mostly clear, coherent and logical with minor steps missing.
Level 3	5-6	<ul style="list-style-type: none"> Demonstrates accurate and relevant biological understanding throughout. Understanding of the scientific ideas, enquiry, techniques and procedures is detailed and fully developed. Presents a description that has a well-developed structure which is clear, coherent and logical.

Level	Mark	Additional Guidance	General additional guidance
	0	No rewardable material	The level is determined by the number of eye defects covered within the response. The mark within the level is determined by the detail within the descriptions.
Level 1	1-2	<ul style="list-style-type: none"> A description of one cause of the eye defects. Linked to an interpretation of the structures in a relevant diagram. 	<p><u>Possible candidate responses</u></p> <ul style="list-style-type: none"> With short-sightedness, light rays are focused in front of the retina. The eyeball is too long. With long-sightedness, light rays are focused behind the retina.
Level 2	3-4	<ul style="list-style-type: none"> A description of at least two causes of the eye defects. Linked to an interpretation of the structures in both diagrams. 	<p><u>Possible candidate responses</u></p> <ul style="list-style-type: none"> With short-sightedness, light rays are focused in front of the retina and the eyeball is too long. With long-sightedness, light rays are focused behind the retina and the eyeball is too short.
Level 3	5-6	<ul style="list-style-type: none"> A description of more than two causes of the eye defects. Linked to an interpretation of both diagrams. 	<p><u>Possible candidate responses</u></p> <ul style="list-style-type: none"> With short-sightedness light rays are focused in front of the retina and the cornea refracts light rays too much. The cornea is too convex. With long-sightedness light rays are focused behind the retina and the lens doesn't refract light enough. The eyeball is too short.

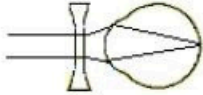
Q5.

Question Number	Answer	Additional guidance	Mark
	<p>Any two from:</p> <ul style="list-style-type: none"> • positive correlation/increases (1) • by 125 million people/correct manipulation of data (1) 	<p>accept increases by 125 million for two marks</p>	<p>(2)</p> <p>AO 3 1a AO 3 1b</p>

Q6.

Question Number	Answer	Additional guidance	Mark
	<p>An answer that combines the following points to provide a plan:</p> <ul style="list-style-type: none"> • choose equal numbers of people with brown and blue eyes (1) • test their vision /details of a method to test vision (1) • count the number of people in each group who are short-sighted/if more people with brown eyes are short-sighted the hypothesis is correct / ORA (1) 	<p>accept compare the results for the two groups</p>	<p>(3)</p> <p>AO 3 3a</p>

Q7.

Question number	Answer	Additional guidance	Mark
	<p>An explanation linking:</p> <ul style="list-style-type: none"> • (a diverging lens) {bends/refracts} light rays outwards (1) • so the light rays {meet/converge/focus} on the retina (1) 	<p>ignore refract light rays less</p> <p>accept refract light onto the retina. accept the back of the eye</p> <p>accept a diagram for either or both marking points</p> 	<p>(2)</p> <p>AO1 1</p>

Q8.

Question Number	Answer	Additional guidance	Mark
(i)	<p>Any two from:</p> <ul style="list-style-type: none"> • surgery / removing the lens (1) • replaced with plastic lens (1) 	<p>accept laser (eye) surgery/ use lasers</p> <p>accept replace with a new lens</p>	<p>(2)</p> <p>AO 1 1</p>

Question Number	Answer	Additional guidance	Mark
(ii)	<p>Any two from:</p> <ul style="list-style-type: none"> • less risk of infection (to eye) (1) • less risk of permanent damage (to eye) (1) • less cost / easier to do / fewer visits to hospital / no recovery time needed (1) 	<p>accept no surgery needed</p>	<p>(2)</p> <p>AO 2 1</p>

Q9.

Question number	Answer	Additional guidance	Mark
(i)	<p>An explanation linking:</p> <ul style="list-style-type: none"> the pupil gets smaller (1) (the) iris (1) gets bigger (1) 	<p>accept (circular) muscles contract (1)</p> <p>accept radial muscles relax (1)</p>	<p>(3)</p> <p>A01 1</p>

Question number	Indicative content	Mark
(ii)	<p style="text-align: center;">A02</p> <p>why distant objects cannot be seen clearly</p> <ul style="list-style-type: none"> person is near-sighted / short-sighted / has myopia light is not focused on retina light is focused in front of the retina the eyeball is too long the cornea is too curved / convex /converging the lens cannot be made thin enough so the light is refracted too much <p>how the problem can be corrected</p> <ul style="list-style-type: none"> go to the opticians go to have your eyesight tested have glasses / contact lenses prescribed glasses / contact lenses need to be concave / diverging have laser treatment (of cornea) cornea needs to be less convex so light is refracted less before it enters the eye so light is focused on the retina 	<p>(6)</p> <p>A02 1</p>

Edexcel Biology GCSE - The Eye

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1-2	<ul style="list-style-type: none"> • Demonstrates elements of biological understanding, some of which is accurate. Understanding of scientific, enquiry, techniques and procedures lacks detail. • Presents a description which is not logically ordered and with significant gaps.
Level 2	3-4	<ul style="list-style-type: none"> • Demonstrates biological understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas, enquiry, techniques and procedures is not fully detailed and/or developed. • Presents a description of the procedure that has a structure which is mostly clear, coherent and logical with minor steps missing.
Level 3	5-6	<ul style="list-style-type: none"> • Demonstrates accurate and relevant biological understanding throughout. Understanding of the scientific ideas, enquiry, techniques and procedures is detailed and fully developed. • Presents a description that has a well-developed structure which is clear, coherent and logical.

Level	Mark	Additional Guidance	General additional guidance
	0	No rewardable material	The level is determined by the areas of indicative content covered within the response. The mark within the level is determined by the detail within each description.
Level 1	1-2	<ul style="list-style-type: none"> Makes a simple reference to the eye problem or how it can be corrected. 	<p><u>Possible candidate responses</u></p> <ul style="list-style-type: none"> Wear glasses (bottom of level 1) The light comes together in front of the retina (good level 1)
Level 2	3-4	<ul style="list-style-type: none"> Refers to both areas of indicative content OR <ul style="list-style-type: none"> Gives an explanation of the eye problem OR <ul style="list-style-type: none"> how to correct the eye problem. 	<p><u>Possible candidate responses</u></p> <ul style="list-style-type: none"> The light is bent too much at the front of the eye so you need to wear glasses (bottom of level 2 – both areas referred to) Light is bent too much at the cornea so it focuses in front of the retina (good level 2 – an explanation of one area)
Level 3	5-6	<ul style="list-style-type: none"> Refers to both areas of indicative content and gives a detailed explanation of one area OR <ul style="list-style-type: none"> Gives a detailed explanation of both areas of indicative content 	<p><u>Possible candidate responses</u></p> <ul style="list-style-type: none"> The person is short-sighted. The cornea is too curved so the light is bent so that it is focused in front of the retina. Glasses need to be worn to correct the problem (bottom of level 3 – both areas and one in detail) The person is short-sighted because the cornea is too convex, so light is focused in front of the retina. To correct the problem you need glasses to make light meet on the retina (good level 3 – both areas explained)

Q10.

Question number	Answer	Mark
	An answer linking four from: <ul style="list-style-type: none"> cone cells (1) (cone cells) responsible for colour vision (1) rod cells (1) (rod cells) detect intensity of light (1) (both) send impulses to the brain (1) 	<p>(4)</p> <p>A01 1</p>

Q11.

Question Number	Answer	Mark		
(i)	<p>D</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>refracts light</td> <td>refracts light</td> </tr> </table> <p>The only correct answer is D</p> <p><i>A is not correct because structure Y does not detect light</i></p> <p><i>B is not correct because structure X does not detect light</i></p> <p><i>C is not correct because structure X does not reflect light</i></p>	refracts light	refracts light	(1) AO1 1
refracts light	refracts light			

Question Number	Answer	Additional Guidance	Mark
(ii)	<p>A description including two from:</p> <ul style="list-style-type: none"> • pupil becomes smaller (1) • the iris changes shape (1) • correct light intensity is detected by {retina / rods / cones} (1) 	<p>accept the iris get larger</p> <p>accept reduces the amount of light entering the eye / protects the retina</p>	(2) AO2 1

Q12.

Question Number	Answer	Mark
(i)	<p>D lens</p> <p>1. The only correct answer is D</p> <p><i>A is not correct because cataracts do not form in the retina</i></p> <p><i>B is not correct because cataracts do not form in the iris</i></p> <p><i>C is not correct because cataracts do not form in the cornea</i></p>	(1) AO 1 1

Question Number	Answer	Mark
(ii)	An explanation linking: <ul style="list-style-type: none"> • lens becomes cloudy (1) • less light reaches retina (1) 	(2) AO 2 1

Q13.

Question number	Answer	Mark
(i)	D optic nerve The only correct answer is D <i>A is not correct because the cornea does not carry impulses to the brain</i> <i>B is not correct because the iris does not carry impulses to the brain</i> <i>C is not correct because the lens does not carry impulses to the brain</i>	(1) AO1 1

Question number	Answer	Additional guidance	Mark
(ii)	iris	accept radial muscles / circular muscles	(1) AO1 1

Q14.

Question number	Answer	Mark
	<p>C cones</p> <p>The only correct answer is C</p> <p><i>A is not correct because the iris controls the size of the pupil</i></p> <p><i>B is not correct because the lens focuses the light rays onto the retina</i></p> <p><i>D is not correct because the cornea refracts light</i></p>	<p>(1)</p> <p>AO1 (1)</p>

Q15.

Question number	Answer	Mark
(i)	D	(1)

Question number	Answer	Mark
(ii)	C	(1)

Question number	Answer	Mark
(iii)	cerebrum	(1)

Q16.

Question number	Answer	Mark
(i)	<p>D retina</p> <p>The only correct answer is D</p> <p><i>A is incorrect because the cornea does not contain light receptor cells</i></p> <p><i>B is incorrect because the iris does not contain light receptor cells</i></p> <p><i>C is incorrect because the lens does not contain light receptor cells</i></p>	<p>(1)</p> <p>AO2 1</p>

Question number	Answer	Mark
(ii)	<p>mitochondria / mitochondrion</p> <p>accept phonetic spellings</p>	<p>(1)</p> <p>AO2 1</p>

Question number	Answer	Mark
(iii)	<p>nucleus / nuclei</p> <p>accept phonetic spellings</p>	<p>(1)</p> <p>AO2 1</p>

Question number	Answer	Additional guidance	Mark
(iv)	rods / rod cells	reject cones	<p>(1)</p> <p>AO2 1</p>

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Question number	Answer	Additional guidance	Mark
(v)	<p>A description including two of the following:</p> <ul style="list-style-type: none"> cell B is a cone cell (1) involved in colour vision (1) 	<p>accept responds to bright light / high light intensities</p> <p>accept responds to different wavelengths frequencies of light (1)</p>	(2) AO2 1

Q17.

Question number	Answer	Additional guidance	Mark
(i)	<p>Change the subject of the equation</p> <p>time = distance ÷ speed (1)</p> <p>Conversion of mm to m</p> <p>47 ÷ 1000 = 0.047(m) (1)</p> <p>Substitution</p> <p>0.047 ÷ 75 = 0.0006267 (seconds)</p>	<p>award full marks for correct answer no working</p> <p>accept any correct rounding - 0.00063 / 0.000626(recurring) / 0.0006</p> <p>accept answers in standard form</p>	(3) AO2 1

	<p>OR</p> <p>Change the subject of the equation</p> <p>time = distance ÷ speed (1)</p> <p>Conversion of m to mm</p> <p>75 × 1000 = 75000 (mm) (1)</p> <p>Substitution</p> <p>47 ÷ 75000 = 0.0006267 (seconds)</p>		
		<p>accept any correct rounding - 0.00063 / 0.000626(recurring) / 0.0006</p> <p>accept answers in standard form</p>	

Question number	Answer	Mark
(ii)	<p>A cerebral hemispheres</p> <p>The only correct answer is A</p> <p><i>B is incorrect because the occipital lobe is not located in the medulla oblongata</i></p> <p><i>C is incorrect because the occipital lobe is not located in the cerebellum</i></p> <p><i>D is incorrect because the occipital lobe is not located in the hypothalamus</i></p>	<p>(1)</p> <p>AO1 1</p>

Question number	Answer	Mark
(iii)	(eye)sight / vison / seeing / being able to see	<p>(1)</p> <p>AO2 1</p>

Q18.

Question number	Answer	Mark
(i)	<p>C structure S</p> <p>The only correct answer is C</p> <p><i>A is incorrect because cataracts do not develop in the retina.</i></p> <p><i>B is incorrect because cataracts do not develop in the sclerotic.</i></p> <p><i>D is incorrect because cataracts do not develop in the cornea.</i></p>	(1) AO1 1

Question number	Answer	Additional guidance	Mark
(ii)	<p>A description including two of:</p> <ul style="list-style-type: none"> • cut into the eye / use a laser (to open the eye) (1) • replace (old / opaque) lens (1) • with a new clear artificial / plastic / glass lens (1) 		(2) AO1 1

Q19.

Question Number	Answer	Mark
(i)	<p>B the lens gets thicker to bend the light rays more</p> <p>1. The only correct answer is B</p> <p><i>A is not correct because it would not bend the light rays more.</i></p> <p><i>C is not correct because the light rays need to be bent more.</i></p> <p><i>D is not correct because the light rays need to be bent more.</i></p>	(1) AO 2 1

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Question Number	Answer	Additional guidance	Mark
(ii)	light rays meet in front of the retina (1)	accept eye is too long/too big accept light is refracted too much	(1) AO 1 1

Question Number	Answer	Additional guidance	Mark
(iii)	concave /diverging / minus (lens)	ignore contact lens	(1) AO 1 1