

**GCSE Biology B (Twenty First Century Science)**  
**J257/01 Breadth in Biology (Foundation)**

**Question Set 1**

Multiple Choice Questions

1 The eye is a sense organ.

(a) Each part of the eye is adapted to its specific function.

The table describes the functions of different parts of the eye.

Complete the table by writing the **part of the eye** that matches each **description**.  
Choose from the words below:

**ciliary muscle      cornea      iris      lens**

Part of the eye	Description
Iris	A ring of tissue that changes size to alter the diameter of the pupil, to control the amount of light entering the eye.
Cornea	A thin layer of transparent tissue in front of the pupil which bends light as it enters the eye.
Lens	A thick layer of transparent tissue behind the pupil which bends light so it focusses on the retina.
Ciliary muscle	Changes the thickness of the lens to focus light from far and near objects.

[3]

(b) Amir is investigating what happens to pupil size when a person moves from an area of bright light to an area of darkness.

He measures the size of his friend's pupil in bright light.

His results are shown in the table below.

Experiment number	Pupil size (mm)
1	4.0
2	3.8
3	6.0

(i) Calculate the mean pupil size

$$\frac{4 + 3.8 + 6}{3} = \underline{\underline{4.6 \text{ mm}}}$$

Mean pupil size = 4.6 mm [2]

(ii) Amir reads an article that suggests the average pupil size in bright light should be in the range of 2 – 4 mm.

Amir thinks one of his results is an anomalous result.

Which result is most likely to be the anomalous result?

Give a reason for your choice.

6.0 for experiment 3, because it is <sup>much</sup> greater than the other two results. [2]

(iii) What can Amir do to make his results more precise?

*Repeat his experiment again.*

[1]

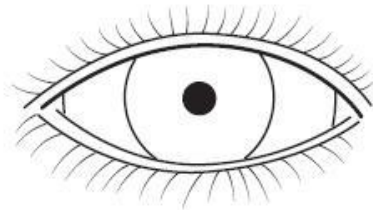
(iv) To create dark conditions Amir asks his friend to put on sunglasses.

Amir draws two diagrams (**Fig. 1.1** and **Fig. 1.2**) to show how the pupil changes when the light conditions change.

**Fig. 1.2** is incomplete.

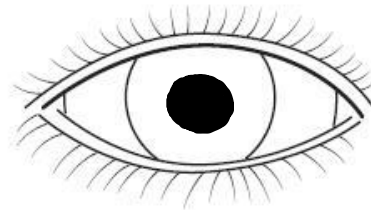
Complete **Fig. 1.2** to show the pupil in dark conditions.

Pupil in bright light



**Fig. 1.1**

Pupil in the dark



**Fig. 1.2**

[1]

(v) The change in pupil size is an example of a

reflex. Which statement best describes a reflex?

Tick (✓) **one** box.

A rapid and involuntary response. ✓

A rapid and voluntary response.

A slow and involuntary response.

A slow and voluntary response.

✓

[1]

(vi) What name is given to the structure that transmits electrical impulses from the eye to the central nervous system?

Put a **ring** around the correct answer.

**effector**

**receptor**

**relay neuron**

**sensory neuron**

[1]

(c) Amir is reading a newspaper but the words look blurry.

When he looks out the window he can see everything outside clearly.

Explain to Amir why the words in the newspaper look blurry and explain how this defect could be corrected.

*Amir is long sighted so he needs glasses with convex lenses. These will make the light rays bend more and allow him to see things clearly from close distance.*

[3]

**Total Marks for Question Set 1: 14**

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