

Coordination and Response

Question Paper 4

Level	IGCSE
Subject	Biology
Exam Board	CIE
Topic	Coordination and Response
Paper Type	(Extended) Theory Paper
Booklet	Question Paper 4

Time Allowed: 63 minutes

Score: /52

Percentage: /100

- 1 (a) Movement is a characteristic of living organisms.

Define the term *movement*.

.....
..... [1]

When the hand is stimulated by a hot object a reflex action occurs in which the fore-arm is raised.

Fig. 2.1 shows the muscles and the neurones involved in the reflex action.

The arrows show where there are nerve impulses during the reflex action.

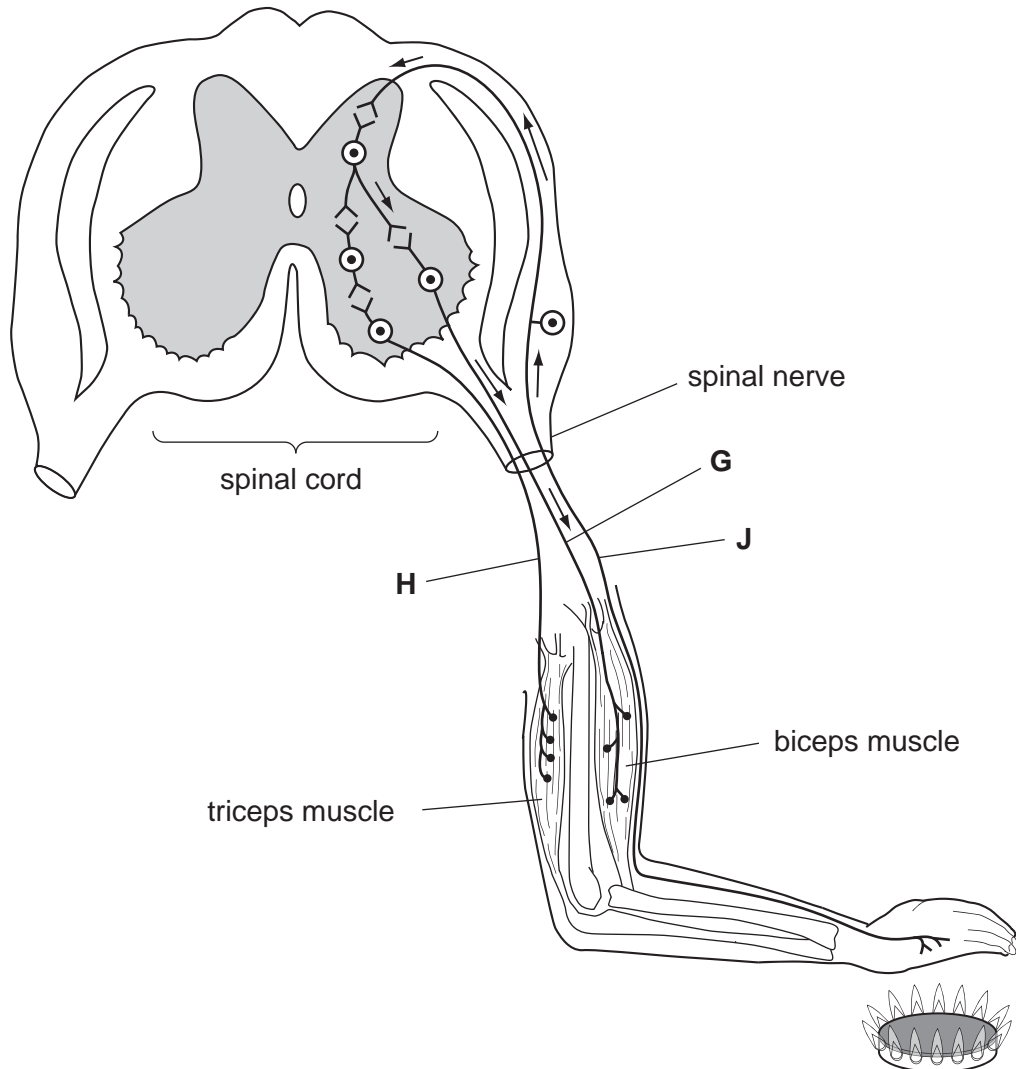


Fig. 2.1

- (b) (i) State the name for the action of two opposing muscles, such as the biceps and the triceps.

..... [1]

(ii) Explain how two opposing muscles bring about movement at the elbow joint.

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..... [3]

(c) (i) Describe the function of neurone J.

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..... [2]

(ii) Explain why there are impulses in motor neurone G, but not in motor neurone H.

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..... [2]

(d) The action shown in Fig. 2.1 is an involuntary reflex action. The muscles can also be used for voluntary actions.

Explain how muscles are controlled during voluntary actions.

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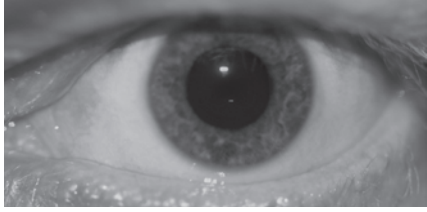
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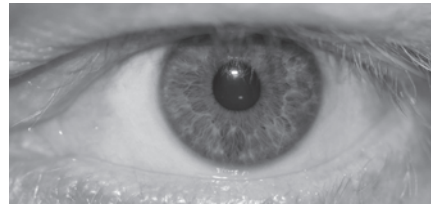
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..... [2]

2 Fig. 2.1 shows the changes that occur to the iris when a light is switched on.



before light is switched on



after light is switched on

Fig. 2.1

(a) Describe **and** explain the change to the eye as the light is switched on.

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..... [2]

(ii) Explain why the change you described is necessary.

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..... [2]

(iii) Distinguish between the functions of rods and cones in the eye.

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..... [2]

Fig. 2.2 shows the neurones involved in stimulating the muscles in the iris when the changes shown in Fig. 2.1 take place.

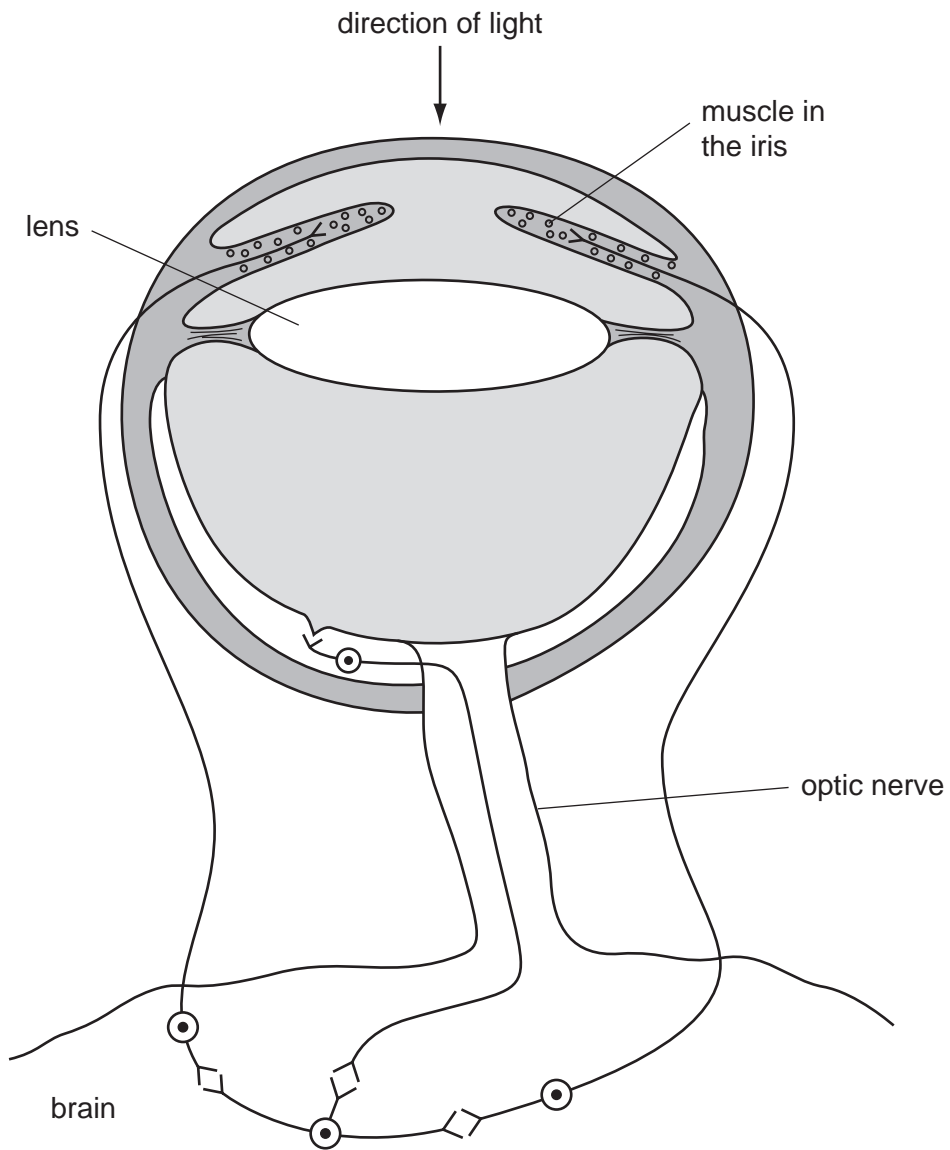


Fig. 2.2

(b) On Fig. 2.2 draw an arrow on each of the **four neurones** to show the direction taken by the impulses when the light is switched on. [1]

(c) Muscles in the iris are described as antagonistic.

Explain the term *antagonistic* using the muscles in the iris as an example.

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..... [3]

(d) Neurones that terminate in the adrenal gland stimulate the release of adrenaline into the blood.

(i) Describe situations when adrenaline would be released from the gland into the blood.

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..... [3]

(ii) State **one** advantage of releasing adrenaline to coordinate the body rather than using nerve impulses.

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..... [1]

[Total: 14]

3 (a) Define the term *sensitivity*.

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..... [2]

Fig. 1.1 shows a horizontal section through the eye.

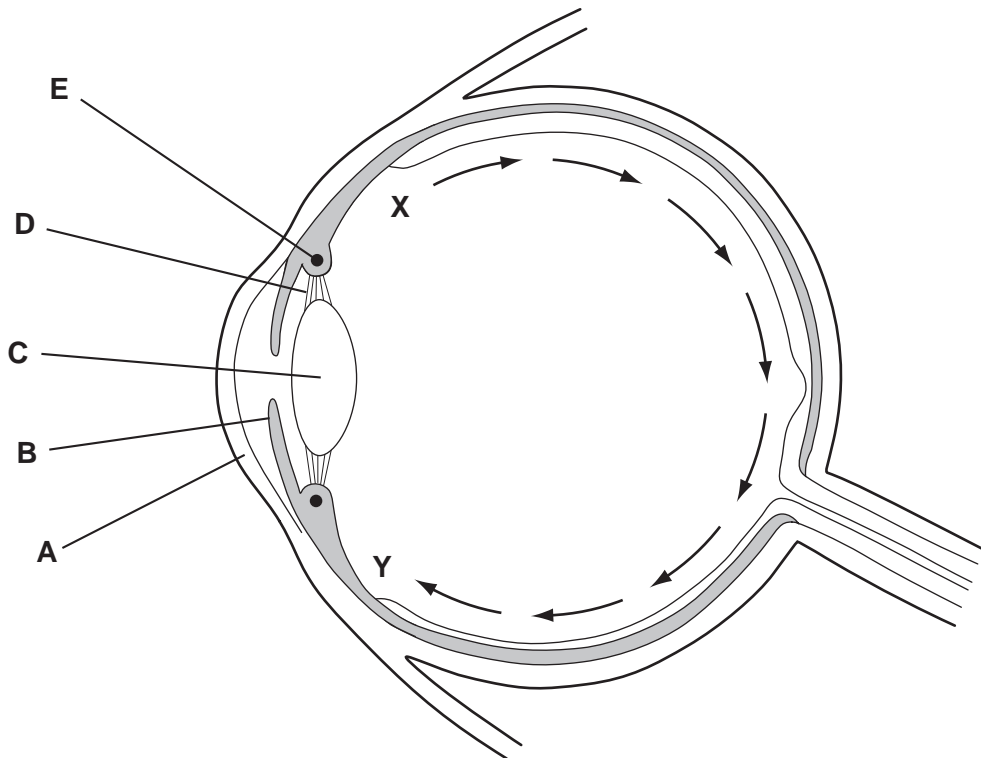


Fig. 1.1

(b) Name structures A to D.

A

B

C

D [4]

(ii) State the functions of structures B and E.

B

E [2]

The retina contains light-sensitive cells known as rods and cones. The distribution of rods in the retina from point **X** to point **Y**, as shown on Fig. 1.1, was investigated.

Fig. 1.2 shows the distribution of rods in the retina from point **X** to point **Y**.

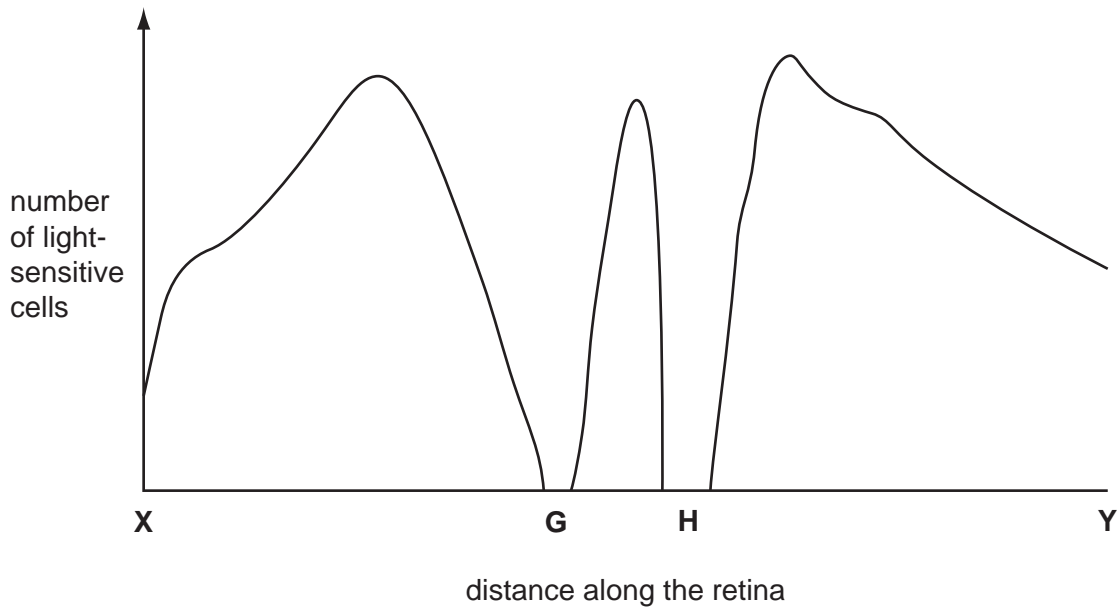


Fig. 1.2

(c) **G** and **H**, as shown on Fig. 1.2, are parts of the retina.

Name **G** and **H**.

G

H [2]

(ii) Describe the function of the rods.

.....

 [2]

(iii) Draw a line on Fig. 1.2 to show the distribution of cones in the retina. [2]

[Total: 14]

- 4 (a) Define the terms *sensitivity* and *involuntary action*.

sensitivity

.....

involuntary action

.....

..... [3]

Fig. 1.1 shows the reflex arc for the knee jerk reflex.

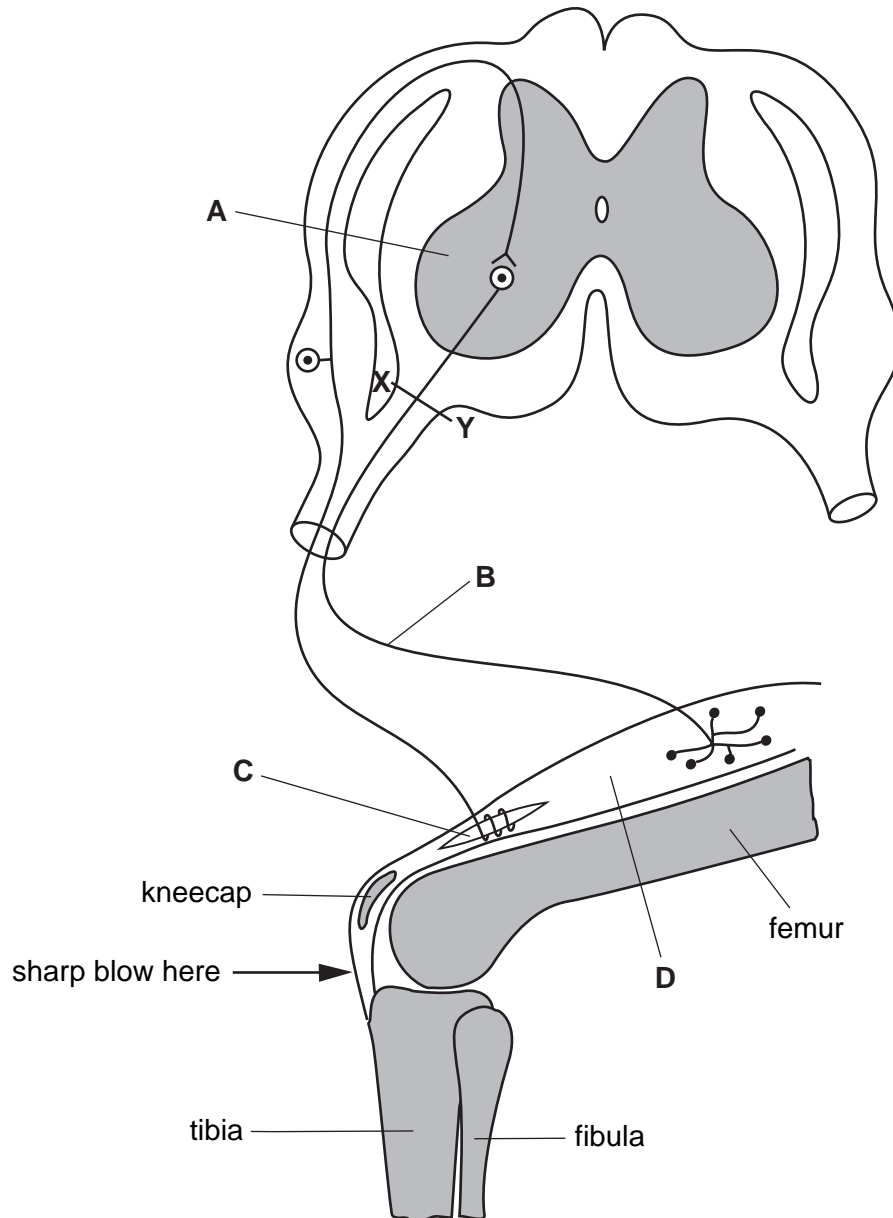


Fig. 1.1

(b) Name parts **A** to **D**.

- A
- B
- C
- D [4]

(ii) Nerve cells use active transport to move ions across their cell membranes.

Explain what is meant by the term *active transport*.

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- [2]

(c) Explain what would happen to the reflex shown in Fig. 1.1 if the nerve was cut across at **X-Y**.

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- [3]

(d) Fig. 1.2 shows the grasping reflex of a baby.

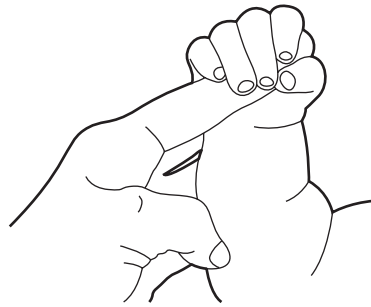


Fig. 1.2

Suggest why it is a good idea to test a baby's reflexes immediately after birth.

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..... [1]

[Total: 13]