

# SCIENCE COORDINATE

0654 | Paper 3

2020 — 2025

## Chapter 1- BIOLOGY

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1 - (0973/32\_Summer\_2020\_Q1)

(a) A student investigates the conditions that affect germination of seeds.

Each test-tube has different conditions, as shown in Fig. 1.1.

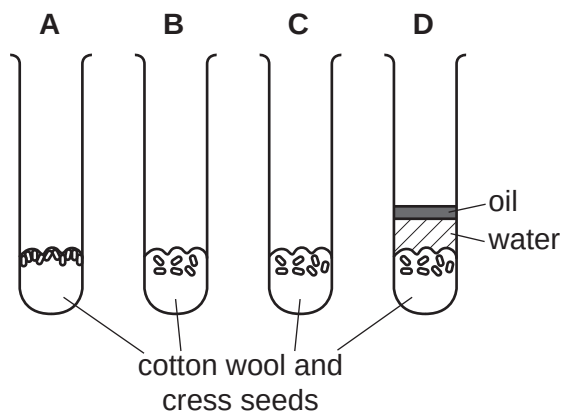


Fig. 1.1

Table 1.1 summarises these conditions.

Table 1.1

| test-tube | temperature / °C | condition of cotton wool |
|-----------|------------------|--------------------------|
| <b>A</b>  | 20               | damp                     |
| <b>B</b>  | 5                | damp                     |
| <b>C</b>  | 20               | dry                      |
| <b>D</b>  | 20               | damp                     |

Only the seeds in test-tube **A** germinate.

(i) State **one** conclusion about the conditions needed for germination shown by test-tubes:

**A and B** .....

.....

**A and C** .....

.....

[2]

(ii) Suggest why the seeds in test-tube **D** did not germinate.

..... [1]

- (iii) Ten cress seeds were used in test-tube **A**. Only eight seeds germinated.

Calculate the percentage of seeds that germinated.

..... % [1]

- (b) Seedlings of cress plants were grown in a Petri dish.

A lamp was placed next to the Petri dish, as shown in Fig. 1.2.



**Fig. 1.2**

- (i) Draw an arrow on Fig. 1.2 to predict the direction of continued growth of the seedlings. [1]

- (ii) State the name of the growth response to light in plants.

..... [1]

- (c) Cress plants reproduce by sexual reproduction, which involves gametes.

- (i) Use words or phrases from the list to complete the definition of the term *sexual reproduction*.

Each word or phrase may be used once, more than once or not at all.

**cell walls**

**chromosomes**

**fetus**

**nuclei**

**sex**

**zygote**

Sexual reproduction is a process involving the fusion of the .....  
of two gametes (..... cells) to form a .....  
and the production of offspring that are genetically different from each other. [3]

- (ii) State the function of the ovary in a plant.

..... [1]

- (iii) State the name of the **male** gamete in **humans**.

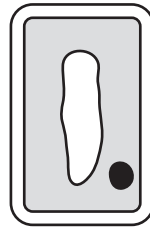
..... [1]

[Total: 11]

2 - (0973/31\_Winter\_2020\_Q7)

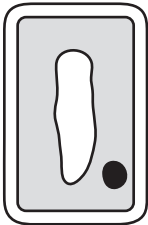
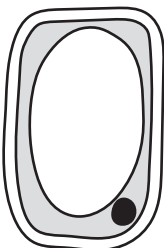
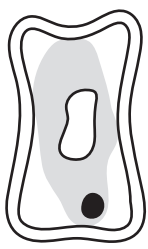
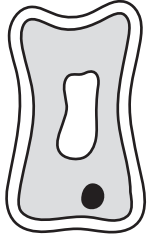
- (a)** A student investigates the changes to plant cells when they are immersed in different concentrations of sugar solutions.

Fig. 7.1 shows a plant cell before immersion in a sugar solution.



**Fig. 7.1**

Fig. 7.2 shows the concentrations of the sugar solutions used and the appearance of the cells after immersion.

| concentration of sugar solution | final appearance of plant cell                                                                    |
|---------------------------------|---------------------------------------------------------------------------------------------------|
| no sugar                        | <b>A</b><br>   |
| low                             | <b>B</b><br>   |
| medium                          | <b>C</b><br>  |
| high                            | <b>D</b><br> |

**Fig. 7.2**

(i) On Fig. 7.2, draw lines to link each concentration of sugar solution to the final appearance of the plant cell. [3]

(ii) Suggest which plant cell, **A**, **B**, **C** or **D**, was placed in a solution of the same concentration as the plant cell.

..... [1]

(b) The change in appearance of the plant cells is caused by osmosis.

Describe the process of osmosis.

..... [2]

(c) Water and carbon dioxide are the raw materials needed for photosynthesis.

(i) State **two other** requirements needed for photosynthesis.

1 .....

2 .....

[2]

(ii) Complete the flowchart to show the pathway of water through a plant.

..... → root cortex cells → ..... → mesophyll cells [2]

(d) Plants use photosynthesis to make their own nutrients.

State the term used to describe organisms that use photosynthesis to make their own nutrients.

..... [1]

[Total: 11]

3 - (0973/31\_Summer\_2021\_Q7)

**(a)** Table 7.1 shows some of the functions of the main components of blood.

Complete Table 7.1 with the name of the component of blood for each function.

**Table 7.1**

| name of component | function of component                |
|-------------------|--------------------------------------|
|                   | blood clotting                       |
|                   | oxygen transport                     |
|                   | phagocytosis and antibody production |
|                   | used for transport of hormones       |

[4]

**(b)** Some of the substances transported by the blood need to be excreted.

The boxes contain the beginnings and the endings of some sentences.

Join **one** sentence beginning to **one** sentence ending to define the term excretion.**beginning****ending**Excretion is the absorption  
and assimilation of

non-toxic materials only.

Excretion is the digestion of

substances in excess of  
requirements only.Excretion is the removal from  
organisms oftoxic materials and substances in  
excess of requirements.Excretion is the taking in to  
organisms oftoxic materials and substances  
required by the body.

[2]

**(c)** Excretion, respiration and nutrition are three characteristics of living organisms.

Name two other characteristics of living organisms.

1 .....

2 .....

[2]

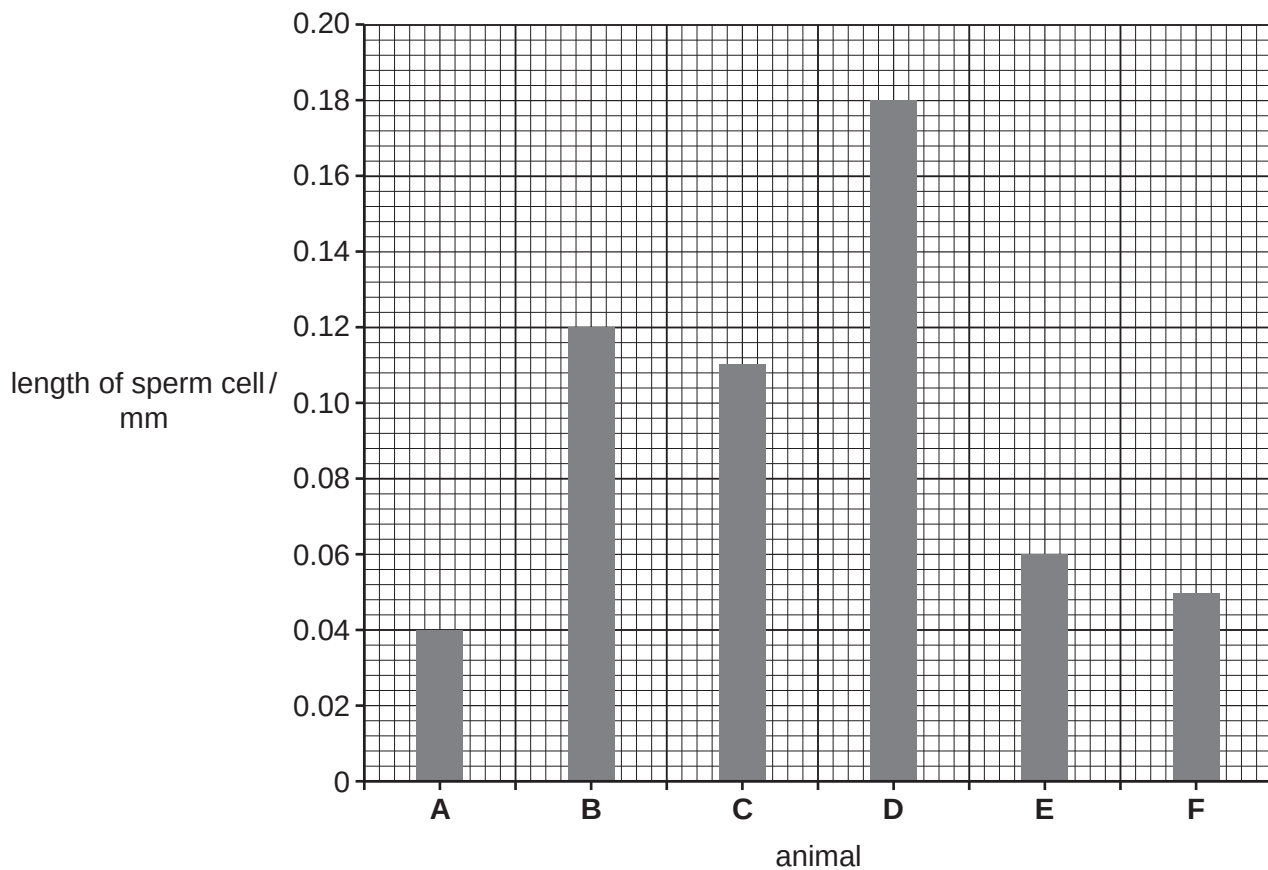
[Total: 8]

4 - (0973/31\_Winter\_2021\_Q1)

(a) Scientists measure the length of sperm cells from different animals.

The animals are placed in size from animal **A** the smallest to animal **F** the largest.

Fig. 1.1 shows the results.



**Fig. 1.1**

(i) Using Fig. 1.1, state the length of a sperm cell in animal **B**.

..... mm [1]

(ii) State the animal with the shortest length of sperm.

..... [1]

(iii) State evidence from Fig. 1.1 that shows that length of sperm does **not** increase with size of animal.

..... [1]

**(b)** Plant and animal cells both contain a nucleus.

Name **two other** structures seen in both plant and animal cells.

1 .....

2 .....

[2]

**(c)** The boxes on the left show some of the parts of a plant cell.

The boxes on the right show the functions of the parts.

Draw lines to link each part with its function.

**part of plant cell**

**function**

cell wall

contains genetic material

chloroplast

contains cell sap and supports the cell

nucleus

site of photosynthesis

vacuole

strengthens the cell

[3]

**(d)** Substances enter and leave cells.

Name the process by which substances enter the cells.

..... [1]

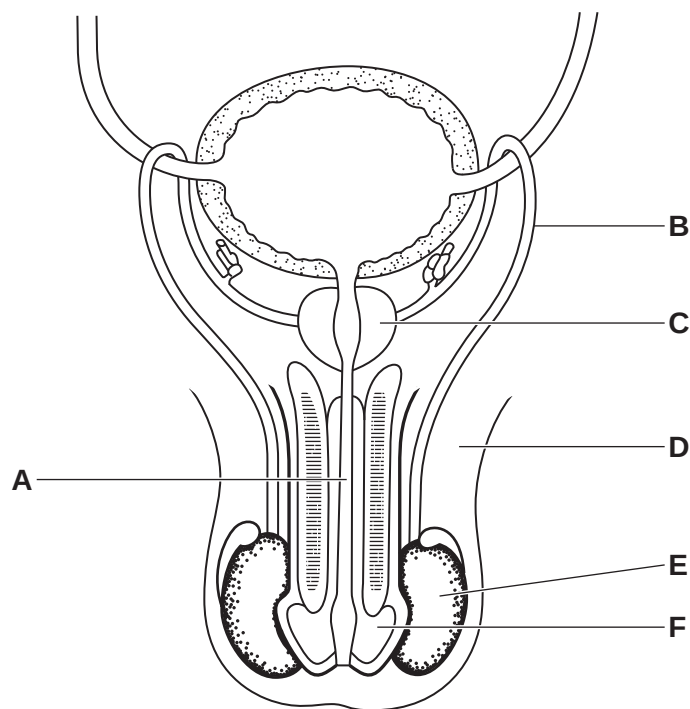
**(e)** Explain why muscle cells need high rates of respiration.

..... [2]

[Total: 11]

5 - (0973/31\_Winter\_2021\_Q4)

(a) Fig. 4.1 is a diagram of the male reproductive system in humans.



**Fig. 4.1**

Identify the letter from Fig. 4.1 that represents the:

part where sperm is produced, .....

part which secretes the fluid that sperm swim in, .....

tube which carries both semen and urine. ....

[3]

(b) State the name of the part of the female reproductive system that releases gametes.

..... [1]

(c) The statements in Table 4.1 describe either asexual or sexual reproduction.

Complete Table 4.1 to identify the type of reproduction each statement describes.

**Table 4.1**

| statement                                         | type of reproduction |
|---------------------------------------------------|----------------------|
| offspring are genetically identical to each other |                      |
| produces zygotes                                  |                      |
| involves the fusion of nuclei                     |                      |

[2]

- (d) Fig. 4.2 is a diagram representing the reproduction of a type of organism called a hydra.

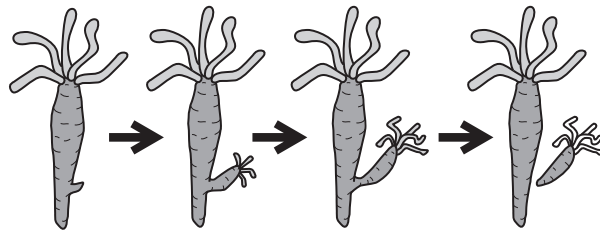


Fig. 4.2

Identify if this organism is reproducing asexually or sexually.

Use evidence from Fig. 4.2 to give a reason for your answer.

type of reproduction .....

reason .....

..... [1]

- (e) Reproduction and respiration are characteristics of living things.

State **two other** characteristics of living things.

1 .....

2 .....

[2]

[Total: 9]

6 - (0973/31\_Winter\_2022\_Q10)

- (a) A researcher collects some information about organisms that live in a desert environment.

Fig. 10.1 is a summary of the information.

Snakes eat desert rats.  
Desert foxes eat snakes.  
Desert rats eat cactus.

**Fig. 10.1**

- (i) Construct a food chain from the information given in Fig. 10.1.

..... [2]

- (ii) Table 10.1 contains the names of the organisms from Fig. 10.1 and some of the terms that can be used to describe them.

Complete Table 10.1 by placing ticks (✓) in the boxes to show all the terms that describe each organism. Use only the information given in Fig. 10.1.

One row has been done for you.

**Table 10.1**

| organism   | carnivore | herbivore | producer | secondary consumer |
|------------|-----------|-----------|----------|--------------------|
| cactus     |           |           | ✓        |                    |
| desert fox |           |           |          |                    |
| desert rat |           |           |          |                    |
| snake      |           |           |          |                    |

[3]

- (b) State the name of the type of organisms that get their energy from dead and waste organic matter.

..... [1]

- (c) State the name of the principal source of energy for all food chains.

..... [1]

**(d)** Nutrition is one of the characteristics of living things.

State the name of **three** other characteristics.

- 1 .....
- 2 .....
- 3 ..... [3]

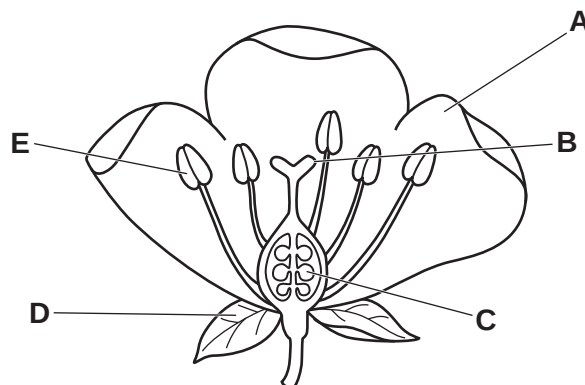
**(e)** State the name of the basic building blocks of which all living organisms are made.

..... [1]

[Total: 11]

7 - (0973/32\_Summer\_2023\_Q1)

**(a)** Fig. 1.1 is a diagram of a flower.



**Fig. 1.1**

State the letter in Fig. 1.1 that identifies the part:

that attracts insects .....

that produces pollen .....

where fertilisation occurs. ....

[3]

**(b)** State the name of the part in the human body where fertilisation takes place.

..... [1]

(c) Some plants reproduce both asexually and sexually.

Table 1.1 compares some of the features of asexual reproduction and sexual reproduction.

Place ticks (✓) in the boxes in Table 1.1 to show the correct features of asexual reproduction and sexual reproduction.

Table 1.1

|                                                  | asexual reproduction | sexual reproduction |
|--------------------------------------------------|----------------------|---------------------|
| involves gametes                                 |                      |                     |
| involves inheritance of genetic information      |                      |                     |
| offspring is genetically identical to the parent |                      |                     |

[2]

(d) Bacteria reproduce by a type of asexual reproduction.

Fig. 1.2 is a diagram of the reproduction of a bacterium.

The original bacterium divides to form two bacteria.

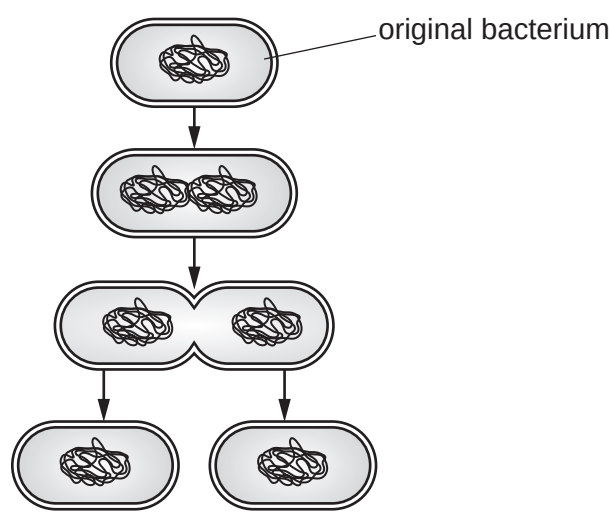


Fig. 1.2

A bacterium can divide every 30 minutes.

Calculate the number of bacteria after 4 hours if you start with one bacterium.

..... [2]

- (e) Reproduction is one of the characteristics of living organisms.

State three other characteristics of living organisms.

- 1 .....
- 2 .....
- 3 ..... [3]

[Total: 11]

8 - (0973/32\_Summer\_2024\_Q1)

- (a) A student watches some scary movies.

The average pulse rate of the student is measured during each movie.

The highest pulse rate of the student is also recorded.

Table 1.1 shows the results.

**Table 1.1**

| movie    | average pulse rate<br>during the movie<br>/ beats per minute | highest pulse rate<br>/ beats per minute | difference in<br>pulse rate<br>/ beats per minute |
|----------|--------------------------------------------------------------|------------------------------------------|---------------------------------------------------|
| <b>A</b> | 82                                                           | 122                                      | 40                                                |
| <b>B</b> | 79                                                           | 116                                      | 37                                                |
| <b>C</b> | 84                                                           | 132                                      | 48                                                |
| <b>D</b> | 80                                                           | 123                                      | 43                                                |
| <b>E</b> | 86                                                           | 104                                      | 18                                                |

The student has a 'flight or fight' response to the movies causing adrenaline to be released.

- (i) Identify the movie in Table 1.1 that results in the **lowest** average pulse rate.

..... [1]

- (ii) Identify the movie in Table 1.1 that results in the **greatest** release of adrenaline.

..... [1]

- (iii) Movie **D** lasts 2 hours.

Using the average pulse rate, calculate the total number of heart beats during the movie.

total = ..... beats [2]

(iv) Circle the target organ for adrenaline that causes the results in Table 1.1.

heart

kidney

ovary

stomach

skin

[1]

(b) State **two** other effects of adrenaline on the body.

Do **not** include the effect on pulse rate.

1 .....

2 ..... [2]

(c) State the component of blood that transports the hormone adrenaline.

..... [1]

(d) The 'flight or fight' situation is a response to a change in the environment.

This is an example of one of the characteristics of living things.

(i) State the name of this characteristic.

..... [1]

(ii) State the name of **one** other characteristic of living things.

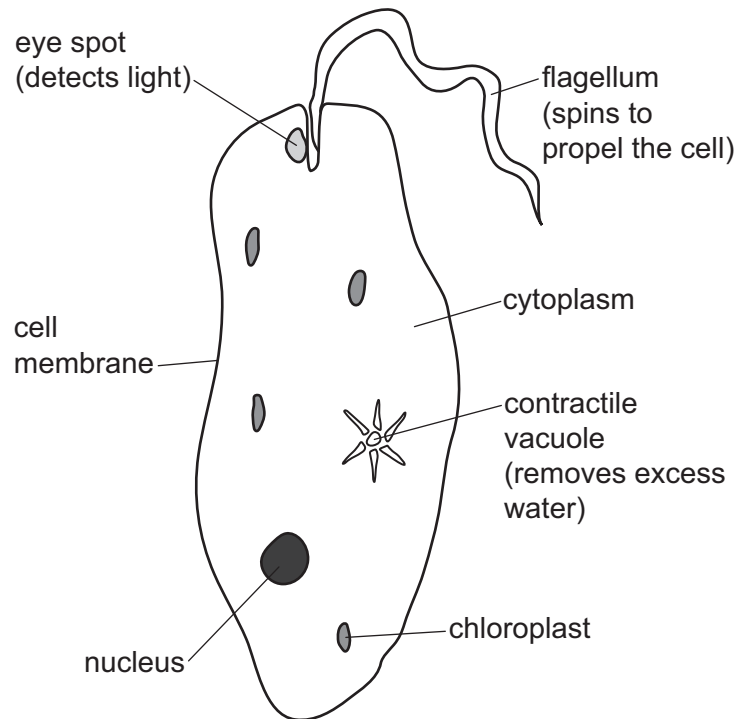
..... [1]

[Total: 10]

9 - (0973/31\_Winter\_2024\_Q1)

- (a) *Euglena* are single-celled organisms that have features of both animal and plant cells.

Fig. 1.1 is a labelled diagram of a *Euglena*.



**Fig. 1.1**

- (i) The parts labelled in Fig. 1.1 are responsible for different characteristics of living organisms.

Identify the part responsible for:

excretion .....

movement .....

nutrition .....

sensitivity. ....

[4]

- (ii) State the name of **one other** characteristic of living organisms.

..... [1]

- (iii) State **one** part from Fig. 1.1 that *Euglena* have in common with plant cells but **not** with animal cells.

..... [1]

- (b) *Euglena* and animal cells do not have cell walls.

State the function of the cell wall.

..... [1]

- (c) Cell walls are made from a type of carbohydrate called cellulose.

Cellulose is made up of smaller molecules of glucose.

- (i) List the chemical elements in all carbohydrates.

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

- (ii) Circle **two** other larger carbohydrate molecules made from glucose.

**fat**

**glycerol**

**glycogen**

**oil**

**protein**

**starch**

[2]

[Total: 10]

10 - (0973/32\_Summer\_2025\_Q3)

Humans are able to detect and respond to changes in their internal and external environment.

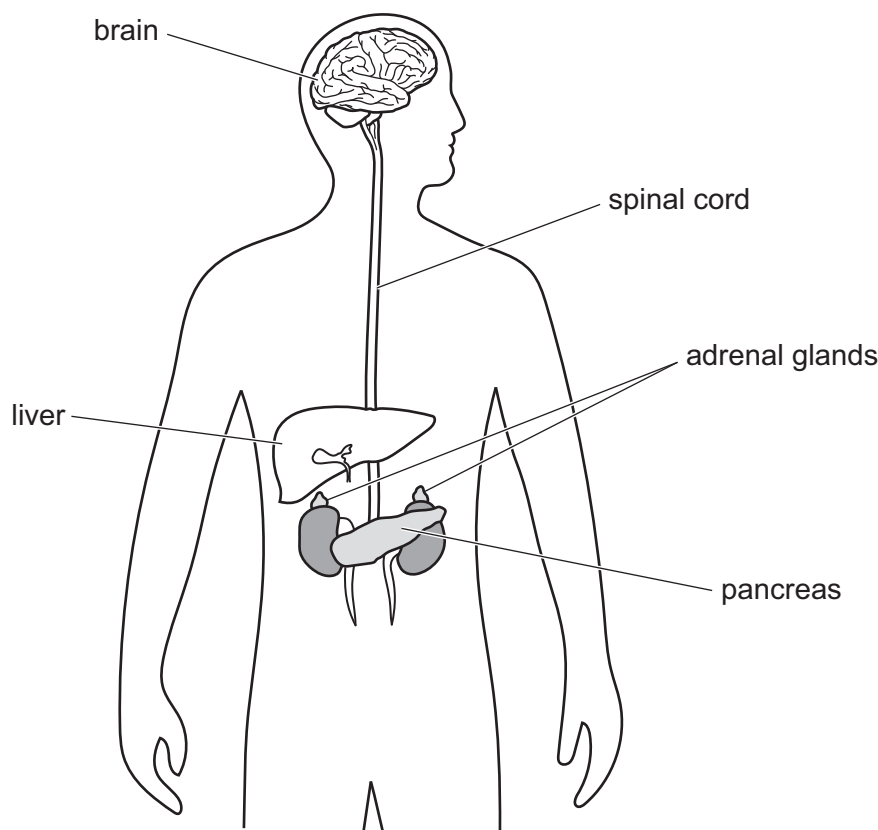
- (a) The ability to detect and respond to changes in the environment is one of the characteristics of living organisms.

Circle this characteristic of living organisms.

**excretion****growth****movement****nutrition****sensitivity**

[1]

- (b) Fig. 3.1 is a diagram of some of the organs involved in detecting and responding to changes in the environment.



**Fig. 3.1**

- (i) Identify the organs from Fig. 3.1 that are part of the central nervous system (CNS).

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

- (ii) Identify the organ from Fig. 3.1 that secretes insulin.

..... [1]

- (iii) Some of the organs shown in Fig. 3.1 conduct electrical impulses through specialised cells.

Name the specialised cells that conduct electrical impulses.

..... [1]

- (iv) Some of the organs shown in Fig. 3.1 secrete hormones.

Complete the sentences about hormones.

Hormones are described as ..... substances.

They are produced by ..... and are carried by the  
..... plasma.

[3]

- (c) Adrenaline is a hormone.

Describe when adrenaline is secreted and the effects of adrenaline on the body.

..... [3]

[Total: 10]

11 - (0973/32\_Summer\_2025\_Q4)

Fig. 4.1 is a picture of a rhino.



Fig. 4.1

- (a) Rhinos only eat plants.

Tick (✓) **two** boxes that describe rhinos.

- |                    |                          |
|--------------------|--------------------------|
| carnivore          | <input type="checkbox"/> |
| decomposer         | <input type="checkbox"/> |
| herbivore          | <input type="checkbox"/> |
| primary consumer   | <input type="checkbox"/> |
| producer           | <input type="checkbox"/> |
| secondary consumer | <input type="checkbox"/> |

[2]

- (b) There are different species of rhino.

Describe what is meant by the term species.

..... [2]

- (c) Some of the rhino species are endangered.

One reason the rhinos are endangered is because their habitat has been destroyed.

- (i) Suggest **two** other reasons why rhinos are endangered.

1 .....

2 ..... [2]

- (ii) Describe **one** reason why habitats are destroyed.

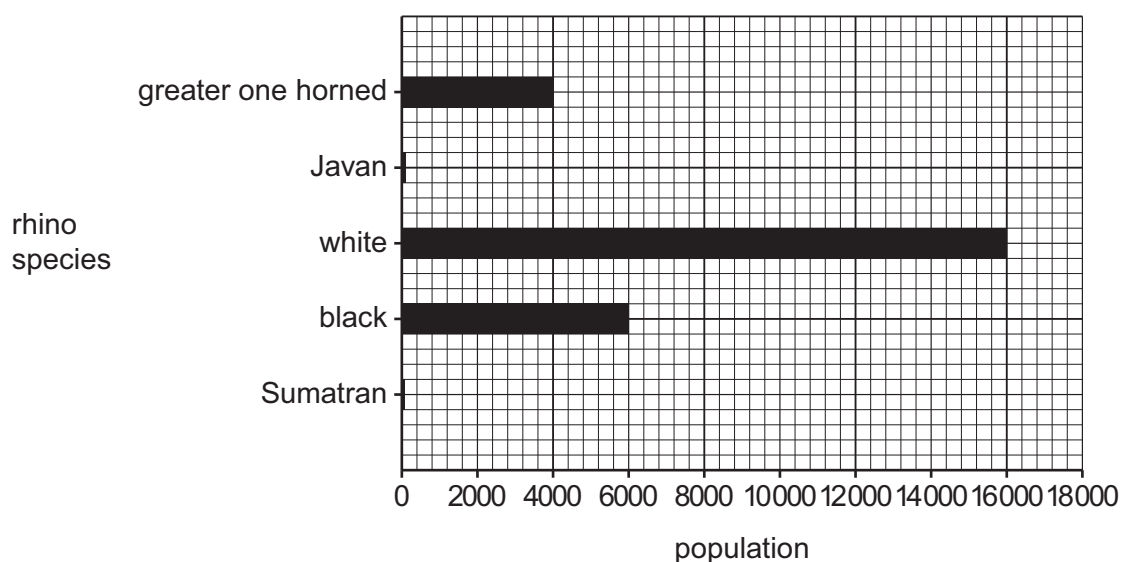
..... [1]

- (d) Scientists are working to conserve all the rhino species.

They use different conservation methods for different species of rhino.

The method they use depends on how many rhinos are still alive in the wild.

Fig. 4.2 is a graph showing the population of each rhino species in 2023.



**Fig. 4.2**

- (i) Identify the rhino species in Fig. 4.2 with the **highest** population.

..... [1]

- (ii) Use Fig. 4.2 to calculate how many times bigger the population of white rhino is compared to the population of black rhino.

..... [2]

- (iii) Black rhinos and white rhinos are kept in protected reserves where they can be monitored 24 hours a day.

Suggest **one** different conservation method that can be used for the Sumatran and Javan rhinos.

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

[Total: 11]

1 - (0973/32\_Summer\_2020\_Q1)

|          |                                                                                                         |          |
|----------|---------------------------------------------------------------------------------------------------------|----------|
| (a)(i)   | warmth / suitable temperature required for germination ;<br>moisture / water required for germination ; | <b>2</b> |
| (a)(ii)  | no oxygen ;                                                                                             | <b>1</b> |
| (a)(iii) | $\left(\frac{8}{10}\right) \times 100 = 80(\%)$ ;                                                       | <b>1</b> |
| (b)(i)   | draw an arrow going from left to right ;                                                                | <b>1</b> |
| (b)(ii)  | phototropism ;                                                                                          | <b>1</b> |
| (c)(i)   | nuclei ;<br>sex ;<br>zygote ;                                                                           | <b>3</b> |
| (c)(ii)  | contains ovules / site of fertilisation / produces ovules ;                                             | <b>1</b> |
| (c)(iii) | sperm ;                                                                                                 | <b>1</b> |

2 - (0973/31\_Winter\_2020\_Q7)

|         |                                                                                         |          |
|---------|-----------------------------------------------------------------------------------------|----------|
| (a)(i)  | no sugar – B<br>low – A<br>medium – D<br>high – C ;;;                                   | <b>3</b> |
| (a)(ii) | A ;                                                                                     | <b>1</b> |
| (b)     | movement of <u>water</u> ;<br>across a, partially permeable / cell, membrane ;<br>AVP ; | <b>2</b> |
| (c)(i)  | light ;<br>chlorophyll ;                                                                | <b>2</b> |
| (c)(ii) | root hair cell ;<br>xylem ;                                                             | <b>2</b> |
| (d)     | producer ;                                                                              | <b>1</b> |

3 - (0973/31\_Summer\_2021\_Q7)

4 - (0973/31\_Winter\_2021\_Q1)

|          |                                                                                                                                              |          |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------|----------|
| (a)(i)   | 0.12 (mm) ;                                                                                                                                  | <b>1</b> |
| (a)(ii)  | A ;                                                                                                                                          | <b>1</b> |
| (a)(iii) | animal F is the biggest but does not have the longest length of sperm / animal D has the longest sperm but is not the biggest animal / avp ; | <b>1</b> |
| (b)      | <i>any two from:</i><br>cell membrane ;<br>cytoplasm ;<br>AVP ; e.g. ribosomes / mitochondria                                                | <b>2</b> |
| (c)      |                                                                                                                                              | <b>3</b> |
| (d)      | diffusion ;                                                                                                                                  | <b>1</b> |
| (e)      | respiration releases energy ;<br>(energy is required) for muscle contraction / movement ;                                                    | <b>2</b> |

5 - (0973/31\_Winter\_2021\_Q4)

|     |                                                                                               |          |
|-----|-----------------------------------------------------------------------------------------------|----------|
| (a) | E ;<br>C ;<br>A ;                                                                             | <b>3</b> |
| (b) | ovary ;                                                                                       | <b>1</b> |
| (c) | asexual<br>sexual<br>sexual<br>;;                                                             | <b>2</b> |
| (d) | asexual<br>offspring produced by only one parent ;                                            | <b>1</b> |
| (e) | <i>any two from:</i><br>movement ;<br>sensitivity ;<br>growth ;<br>excretion ;<br>nutrition ; | <b>2</b> |

6 - (0973/31\_Winter\_2022\_Q10)

|         |                                                                                                                     |           |           |          |                    |          |
|---------|---------------------------------------------------------------------------------------------------------------------|-----------|-----------|----------|--------------------|----------|
| (a)(i)  | cactus → desert rats → snake → desert fox ;;                                                                        |           |           |          |                    | <b>2</b> |
| (a)(ii) | organism                                                                                                            | carnivore | herbivore | producer | secondary consumer | <b>3</b> |
|         | cactus                                                                                                              |           |           | ✓        |                    |          |
|         | desert fox                                                                                                          | ✓         |           |          |                    |          |
|         | desert rat                                                                                                          |           | ✓         |          |                    |          |
|         | snake                                                                                                               | ✓         |           |          | ✓                  |          |
|         | <i>1 mark for each correct row ;;;</i>                                                                              |           |           |          |                    |          |
| (b)     | decomposer ;                                                                                                        |           |           |          |                    | <b>1</b> |
| (c)     | Sun ;                                                                                                               |           |           |          |                    | <b>1</b> |
| (d)     | <i>any three from:</i><br>movement ;<br>respiration ;<br>sensitivity ;<br>growth ;<br>reproduction ;<br>excretion ; |           |           |          |                    | <b>3</b> |
| (e)     | cells ;                                                                                                             |           |           |          |                    | <b>1</b> |

7 - (0973/32\_Summer\_2023\_Q1)

|                                                  |                                                                                                                                                                                                                                                                                                                             |                     |  |   |                      |                     |                  |  |   |                                             |   |   |                                                  |   |  |   |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--|---|----------------------|---------------------|------------------|--|---|---------------------------------------------|---|---|--------------------------------------------------|---|--|---|
| (a)                                              | A ;<br>E ;<br>C ;                                                                                                                                                                                                                                                                                                           |                     |  | 3 |                      |                     |                  |  |   |                                             |   |   |                                                  |   |  |   |
| (b)                                              | oviduct ;                                                                                                                                                                                                                                                                                                                   |                     |  | 1 |                      |                     |                  |  |   |                                             |   |   |                                                  |   |  |   |
| (c)                                              | <table><tr><td></td><td>asexual reproduction</td><td>sexual reproduction</td></tr><tr><td>involves gametes</td><td></td><td>✓</td></tr><tr><td>involves inheritance of genetic information</td><td>✓</td><td>✓</td></tr><tr><td>offspring is genetically identical to the parent</td><td>✓</td><td></td></tr></table><br>;; |                     |  |   | asexual reproduction | sexual reproduction | involves gametes |  | ✓ | involves inheritance of genetic information | ✓ | ✓ | offspring is genetically identical to the parent | ✓ |  | 2 |
|                                                  | asexual reproduction                                                                                                                                                                                                                                                                                                        | sexual reproduction |  |   |                      |                     |                  |  |   |                                             |   |   |                                                  |   |  |   |
| involves gametes                                 |                                                                                                                                                                                                                                                                                                                             | ✓                   |  |   |                      |                     |                  |  |   |                                             |   |   |                                                  |   |  |   |
| involves inheritance of genetic information      | ✓                                                                                                                                                                                                                                                                                                                           | ✓                   |  |   |                      |                     |                  |  |   |                                             |   |   |                                                  |   |  |   |
| offspring is genetically identical to the parent | ✓                                                                                                                                                                                                                                                                                                                           |                     |  |   |                      |                     |                  |  |   |                                             |   |   |                                                  |   |  |   |
| (d)                                              | ref to 8 divisions ;<br>$2^8 = 256$ ;                                                                                                                                                                                                                                                                                       |                     |  | 2 |                      |                     |                  |  |   |                                             |   |   |                                                  |   |  |   |
| (e)                                              | any <b>three</b> from:<br>movement ;<br>respiration ;<br>sensitivity ;<br>growth ;<br>excretion ;<br>nutrition ;                                                                                                                                                                                                            |                     |  | 3 |                      |                     |                  |  |   |                                             |   |   |                                                  |   |  |   |

8 - (0973/32\_Summer\_2024\_Q1)

|          |                                                                                                                 |          |
|----------|-----------------------------------------------------------------------------------------------------------------|----------|
| (a)(i)   | B ;                                                                                                             | <b>1</b> |
| (a)(ii)  | C ;                                                                                                             | <b>1</b> |
| (a)(iii) | 2 hours = 120 minutes ;<br>(120 × 80) = 9600 ;                                                                  | <b>2</b> |
| (a)(iv)  | heart circled ;                                                                                                 | <b>1</b> |
| (b)      | <i>any two from:</i><br><br>increased breathing rate ;<br>widening of pupils ;<br>AVP ;;                        | <b>2</b> |
| (c)      | plasma ;                                                                                                        | <b>1</b> |
| (d)(i)   | sensitivity ;                                                                                                   | <b>1</b> |
| (d)(ii)  | <i>any one from:</i><br>movement ;<br>respiration ;<br>growth ;<br>reproduction ;<br>excretion ;<br>nutrition ; | <b>1</b> |

9 - (0973/31\_Winter\_2024\_Q1)

|          |                                                                    |          |
|----------|--------------------------------------------------------------------|----------|
| (a)(i)   | contractile vacuole ;<br>flagellum ;<br>chloroplast ;<br>eyespot ; | <b>4</b> |
| (a)(ii)  | respiration / growth / reproduction ;                              | <b>1</b> |
| (a)(iii) | chloroplast ;                                                      | <b>1</b> |
| (b)      | strengthen cell / AW ;                                             | <b>1</b> |
| (c)(i)   | carbon, hydrogen, oxygen ;                                         | <b>1</b> |
| (c)(ii)  | glycogen circled ;<br>starch circled ;                             | <b>2</b> |

10 - (0973/32\_Summer\_2025\_Q3)

|          |                                                                                                                                                                                     |          |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| (a)      | sensitivity ;                                                                                                                                                                       | <b>1</b> |
| (b)(i)   | brain <b>and</b> spinal cord ;                                                                                                                                                      | <b>1</b> |
| (b)(ii)  | pancreas ;                                                                                                                                                                          | <b>1</b> |
| (b)(iii) | neurones ;                                                                                                                                                                          | <b>1</b> |
| (b)(iv)  | chemical ;<br>glands ;<br>blood ;                                                                                                                                                   | <b>3</b> |
| (c)      | idea of 'fight or flight' situations ;<br><br>Max <b>two</b> from:<br>increased breathing rate ;<br><br>increased heart rate ;<br><br>increased pupil diameter / AW ;<br><br>AVP ;; | <b>3</b> |

11 - (0973/32\_Summer\_2025\_Q4)

|          |                                                                                                                                                                          |          |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| (a)      | herbivore ;<br>primary consumer ;                                                                                                                                        | <b>2</b> |
| (b)      | (a group of) organisms that can reproduce ;<br>to produce fertile offspring ;                                                                                            | <b>2</b> |
| (c)(i)   | any <b>two</b> from:<br>hunting / AW ;<br>climate change ;<br>pollution ;<br>competition from introduced species ;<br>AVP ;                                              | <b>2</b> |
| (c)(ii)  | (area used) for, housing / industry / crop plant production / livestock production/<br>extraction of natural resources /<br>pollution (causing contamination) /<br>AVP ; | <b>1</b> |
| (d)(i)   | white (rhino) ;                                                                                                                                                          | <b>1</b> |
| (d)(ii)  | 16 000 <b>and</b> 6000 ;<br>2.7 ;                                                                                                                                        | <b>2</b> |
| (d)(iii) | (captive) breeding programmes / education ;                                                                                                                              | <b>1</b> |

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