Centre Number	Candidate Number	Candidate Name

NAMIBIA SENIOR SECONDARY CERTIFICATE

BIOLOGY ORDINARY LEVEL

4322/2

PAPER 2

2 hours

Marks 100

2019

Additional Material: Ruler

INSTRUCTIONS AND INFORMATION TO CANDIDATES

- Candidates answer on the Question Paper in the spaces provided.
- Write your Centre Number, Candidate Number and Name in the spaces at the top of this page.
- Write in dark blue or black pen.
- You may use a soft pencil for any diagrams, graphs or rough working.
- Do not use correction fluid.
- You may use a non-programmable calculator.
- Do not write in the margin *For Examiner's Use*.
- Answer **all** questions.
- The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
1	
2	
3	
4	
5	
6	
7	
8	
Total	

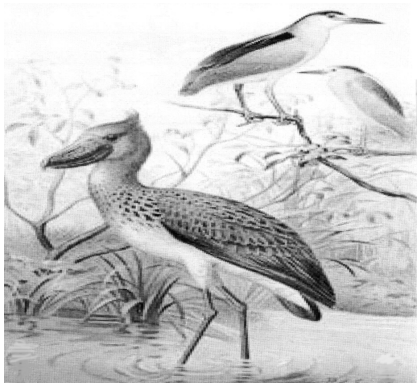
Marker	
Checker	

This document consists of **19** printed pages and **1** blank page.

Republic of Namibia

MINISTRY OF EDUCATION, ARTS AND CULTURE

1 Fig. 1.1 shows animals belonging to different groups.



A

B

Fig. 1.1

(a) (i) State the group to which animal **B** belongs.

..... [1]

(ii) State the class to which the animals in **A** belong.

..... [1]

(iii) Describe **three** visible features which enable the animals in **A** to adapt to their environment.

1 .....

.....

2 .....

.....

3 .....

..... [3]

(b) Scientists found three animals living in a common habitat.

Table 1.1 shows the features of the animals.

Table 1.1

animal	features	group
C	has wings + body covered with fur	.....
D	body covered with a waterproof exoskeleton + 4 pairs of jointed limbs	.....
E	body covered with hard scales + no obvious limbs present	.....

(i) Complete Table 1.1 to name the group to which each animal belongs. [3]

(ii) Animal **C** in Table 1.1 is classified as an endotherm.

Describe the difference between ectothermic and endothermic animals.

.....

.....

.....

..... [2]

(iii) Animal **C** is able to regulate its body temperature.

Write down **three** ways in which animal **C** is able to do this.

1 .....

.....

2 .....

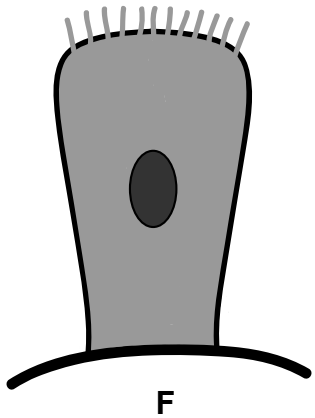
.....

3 .....

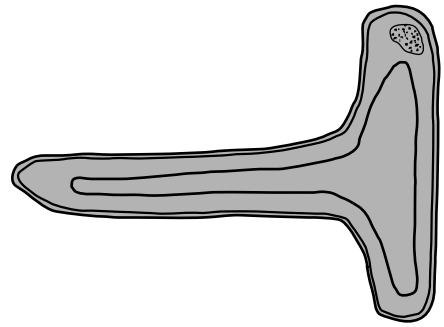
..... [3]

[13]

2 Fig. 2.1 shows specialised cells, **F** and **G**.



F



G

Fig. 2.1

(a) (i) Identify cells **F** and **G**.

F .....

G ..... [2]

(ii) State the term that describes a group of similar cells working together to perform a particular function.

..... [1]

(iii) All cells have a cell membrane.

Name **two other** components that are present in both cells **F** and **G**.

1 .....

2 ..... [2]

(iv) Cell **F** is found in the respiratory tract.

State where else in the body this cell type can be found.

..... [1]

(v) A substance present in tobacco smoke can affect the functioning of cell type **F**.

Name this substance and explain how it affects the functioning of cell type **F**.

substance.....

explanation.....

.....

.....

..... [3]

(vi) Describe **two** features of cell **G** which enable it to perform its function.

1 .....

.....

2 .....

..... [2]

(vii) Cell **G** is a plant cell, and so it has a cell wall.

Name the insoluble component found in its cell wall.

..... [1]

[12]

3 Fig. 3.1 shows a cross-section taken from the stem of a plant.

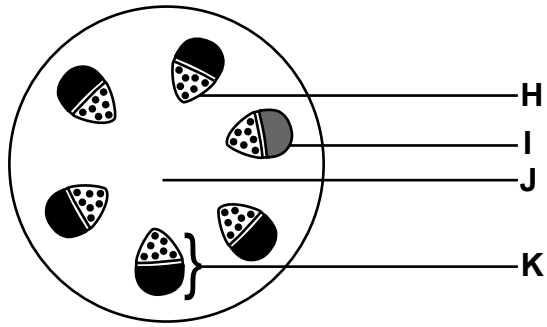


Fig. 3.1

(a) (i) Identify the parts labelled **H**, **I**, **J** and **K**.

H.....

I .....

J .....

K..... [4]

(ii) The part labelled **I** is responsible for translocation.

Define *translocation*.

.....

.....

.....

..... [2]

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(b) (i) In the space below, draw a cross-section of the root of a dicotyledonous plant and label the transport tissues.

[3]

(ii) Explain how water is absorbed by the roots.

.....

.....

.....

.....

.....

..... [3]

[12]

4 Eating protein is vital for all age groups. The food will pass through the alimentary canal where different processes such as absorption, digestion, assimilation and ingestion take place.

(a) List these processes in the order they are carried out.

.....

..... [2]

(b) The liver breaks down excess amino acids when too much protein is consumed.

Describe the process by which the liver breaks down these amino acids.

.....

.....

.....

..... [2]

(c) Fig. 4.1 shows a longitudinal section of part of the ileum wall.

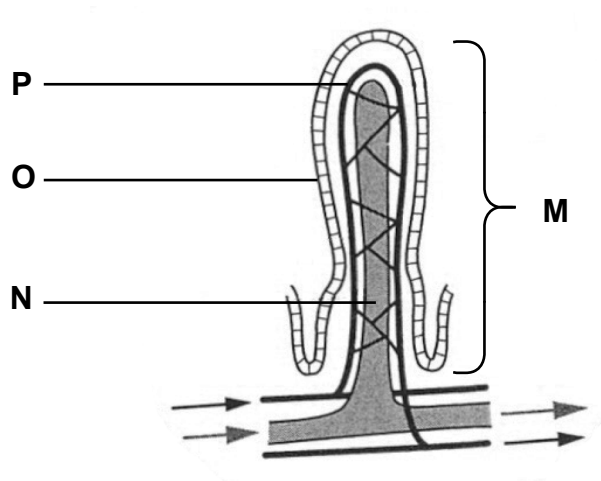


Fig. 4.1

(i) Name structures **M** and **N** and name cell type **O**.

M .....

N.....

O ..... [3]

(ii) Name **two** products of digestion absorbed by **P** and name the process responsible for the absorption.

product .....

is absorbed by .....

product .....

is absorbed by ..... [4]

(d) Table 4.1 shows the energy requirements of different age groups.

Table 4.1

age	energy requirement (kJ)
baby	5 000
toddler	8 000
teenager	12 000
adult	15 000
elderly	10 000

(i) Complete Fig. 4.2 to show the energy requirement of the adult. [1]

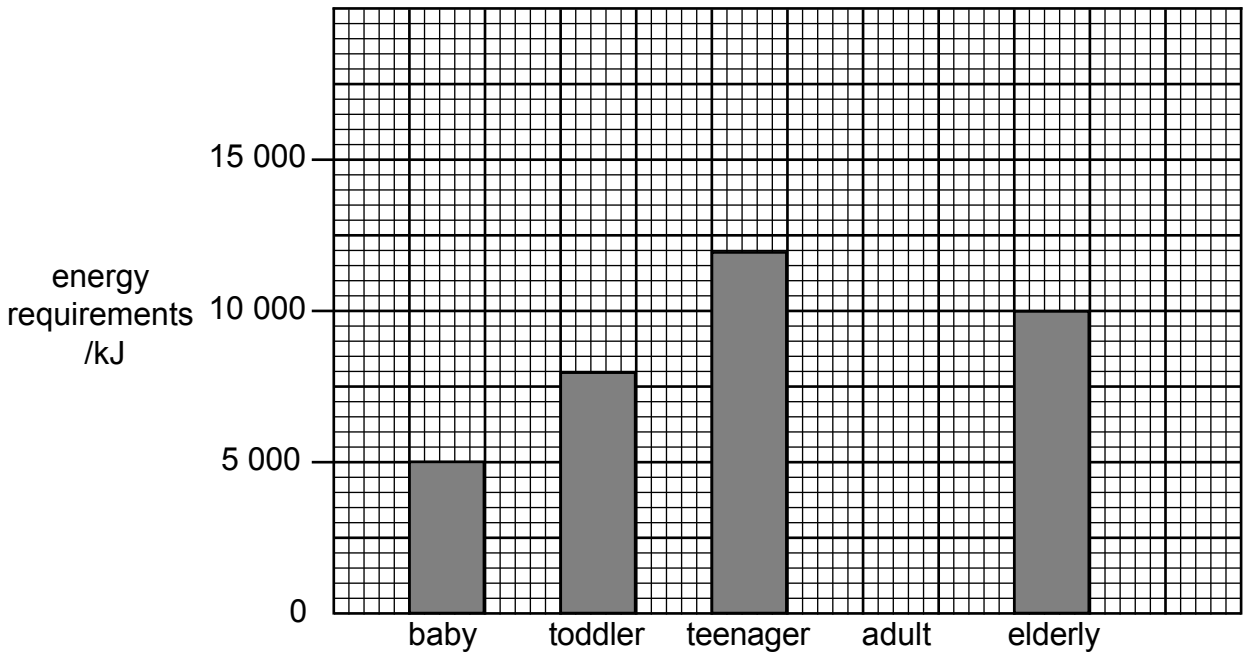


Fig. 4.2

(ii) State **two** conclusions that can be drawn from the data.

1 .....

.....

2 .....

..... [2]

For Examiner's Use

(iii) Suggest **two** reasons why the energy requirements for a baby are less than that of a toddler.

1 .....

.....

2 .....

..... [2]

[16]

5 Fig. 5.1 shows a reflex arc in response to being pricked by a sharp object.

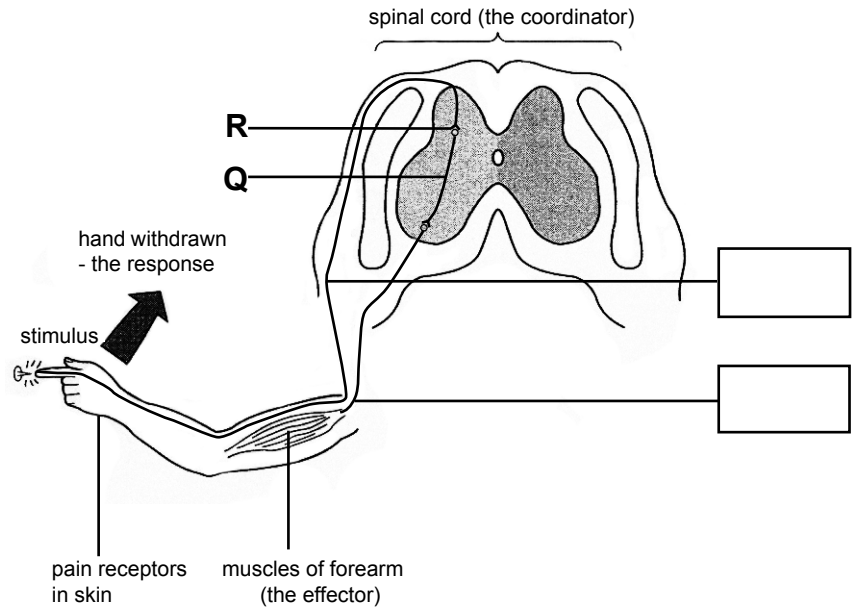


Fig. 5.1

(a) (i) Distinguish between a reflex arc and a reflex action.

.....

.....

.....

..... [2]

(ii) Name **Q**.

..... [1]

(iii) **On Fig. 5.1** add arrows in the boxes provided to indicate the direction the nerve impulse travels to bring about a response. [2]

(iv) Letter **R** on Fig. 5.1 shows a synapse.

What is the function of a synapse?

.....

..... [1]

(b) Fig. 5.2 A shows a seedling with light shining from one side only. Fig. 5.2 B shows an incomplete drawing of the same seedling 5 days later.

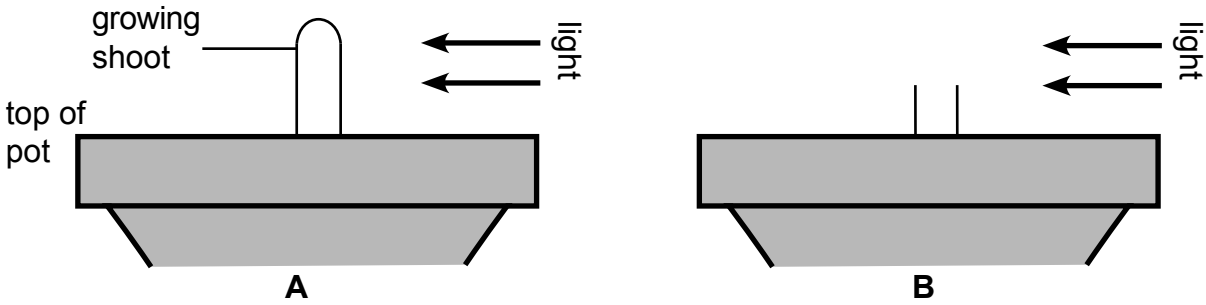


Fig. 5.2

(i) Complete **Fig. 5.2 B** to show what the plant would look like 5 days after being illuminated from one side only. [2]

(c) The plant responds to the light coming from one side only.

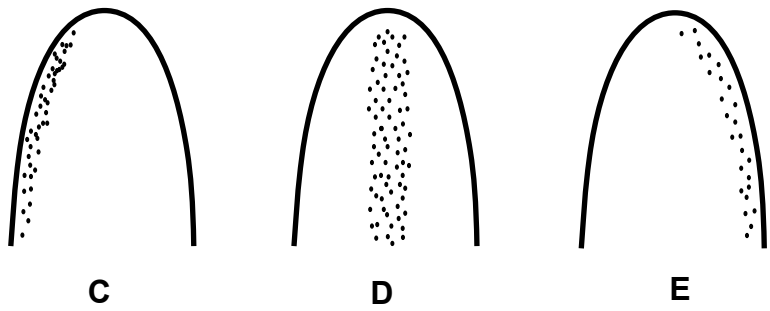
(i) Name this plant response.

..... [1]

(ii) Name the plant hormone which enables this response.

..... [1]

(iii) Which drawing shows the most likely distribution of the hormone in response to **Fig. 5.2 A**.



Write your answer here ..... [1]

(iv) State the advantage to the plant of the response.

.....

..... [2]

[13]

6 Fig. 6.1 shows the events leading to implantation.

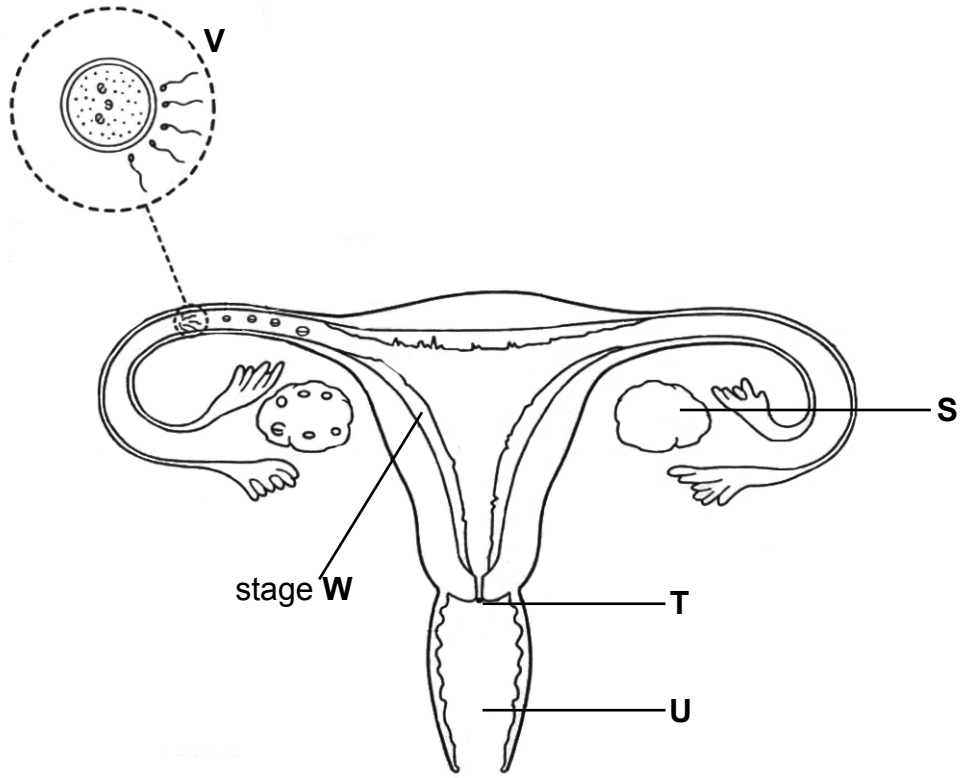


Fig. 6.1

(a) (i) Name parts **S, T** and **U**.

S.....

T.....

U..... [3]

(ii) Name the process occurring at **V**.

..... [1]

(iii) Stage **W** indicates implantation.

What is meant by *implantation*?

.....

.....

.....

..... [2]

(b) Fig. 6.2 shows changes in the uterus and the daily body temperature during the menstrual cycle.

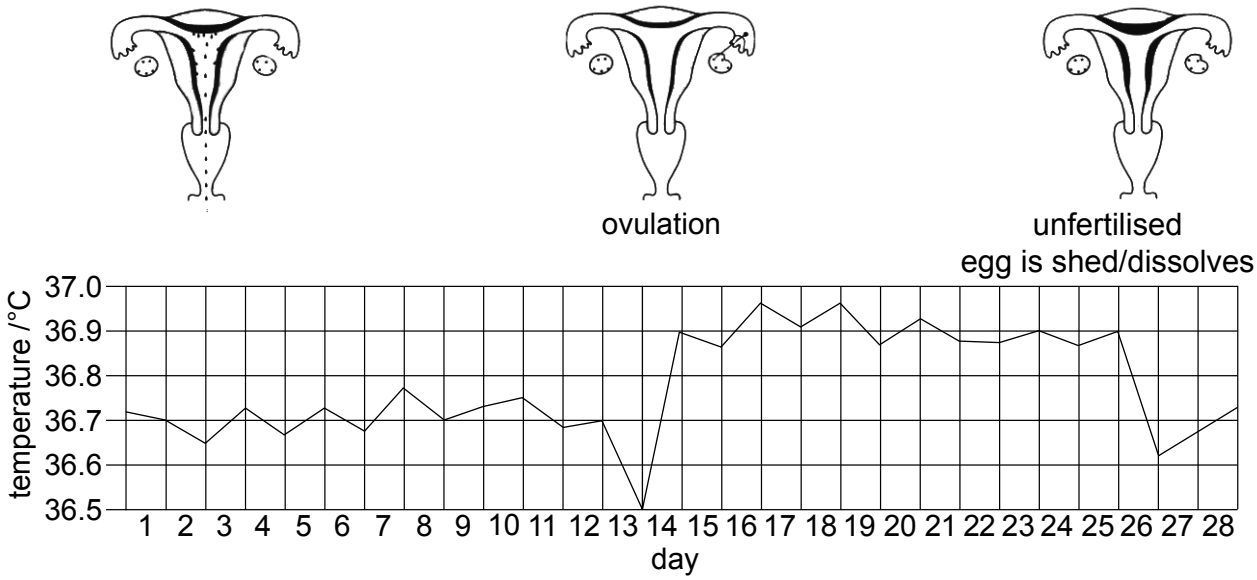


Fig. 6.2

(i) Describe what is happening in the uterus between days **1** and **5**.

.....

.....

.....

..... [2]

(ii) Describe the change in the lining of the uterus between days **14** and **26**.

.....

..... [1]

(iii) Ovulation takes place on day 14.

With reference to Fig. 6.2 describe and explain what happens during ovulation.

.....

.....

.....

..... [2]

(iv) Using only the information provided in Fig. 6.2, explain how this information can be used as a method to prevent pregnancy.

.....

.....

.....

..... [2]

[13]

7 Fig. 7.1 shows a body cell of the fruit-fly, *Drosophila melanogaster*.

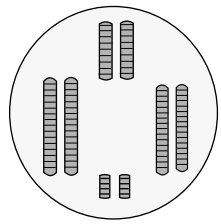


Fig. 7.1

(a) This cell divides by meiosis.

(i) In the space below, draw one daughter cell produced by the fruit-fly by meiosis.

[2]

(ii) What is the importance of meiosis?

1 .....

.....

2 .....

..... [2]

(b) A genetically identical *Drosophila melanogaster* can be produced asexually using cloning.

Outline how this can be done.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [5]

(c) State the species to which this fruit-fly belongs.

..... [1]

[10]

8 **(a)** Some types of power stations and motor vehicles are two sources that contribute to acid rain formation.

With reference to the two examples mentioned discuss the measures that can be taken by humans to reduce the incidence of acid rain on the natural environment.

power stations.....

.....

motor vehicles.....

..... [2]

(b) The 21st century is characterised by an increase in the human population. This population growth has resulted in different types of pollution.

Describe **three** problems that result from water pollution by sewage.

1.....

.....

2.....

.....

3.....

..... [3]

(c) Fig. 8.2 shows a food web.

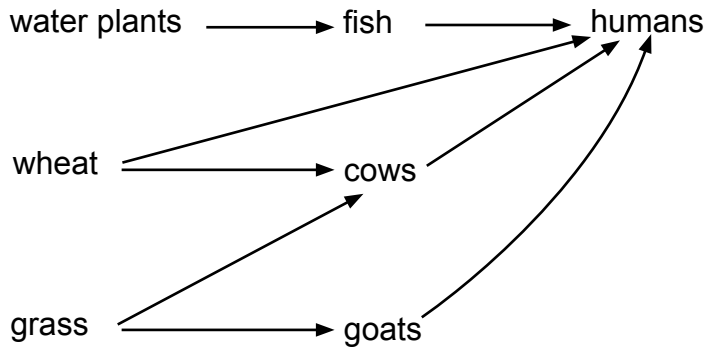


Fig. 8.2

(i) State the principal source of energy input into this food web.

..... [1]

(ii) Name **one** primary consumer.

..... [1]

(iii) Name **one** organism that is both a primary and secondary consumer.

..... [1]

(iv) Using Fig. 8.2, which food chain in the food web makes the most efficient use of the principal energy input?

Explain the reasons for your choice.

food chain.....

explanation.....

.....

.....

.....

.....

..... [3]

[11]

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