

Centre Number	Candidate Number	Candidate Name
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## NAMIBIA SENIOR SECONDARY CERTIFICATE

### BIOLOGY ORDINARY LEVEL

**6116/2**

PAPER 2

1 hour 30 minutes

Marks 80

**2021**

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	
<b>Total</b>	

Marker	
Checker	

This document consists of **16** printed pages.



**Republic of Namibia**  
**MINISTRY OF EDUCATION, ARTS AND CULTURE**

- 1 Fig 1.1 shows the structure of a virus.

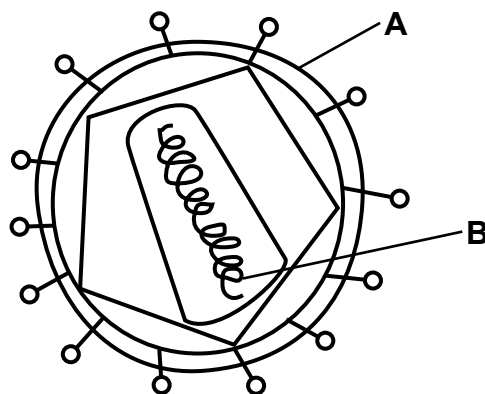


Fig. 1.1

- (a) Identify the parts labelled **A** and **B** in Fig. 1.1.

A .....

B .....

[2]

- (b) Explain why viruses are sometimes considered as non-living.

.....  
 .....  
 .....  
 .....  
 .....  
 .....

[3]

- (c) Human Immuno-deficiency Virus (HIV) causes AIDS by weakening the immune system. The virus may be transmitted during sexual intercourse.

- (i) Describe **two** ways in which the spread of HIV by sexual intercourse may be controlled.

.....  
 .....  
 .....  
 .....

[2]

- (ii) Explain why viral infections cannot be treated with antibiotics.

.....  
 .....

[1]

(iii) Explain the role of vaccination in controlling the spread of diseases.

.....

.....

.....

.....

[2]

**[10]**

**2 (a)** Define the term *enzyme*.

.....

.....

.....

.....

[2]

**(b)** Describe how you could test for the presence of protein in a food sample.  
Include a description of the positive result of the food test.

test .....

.....

.....

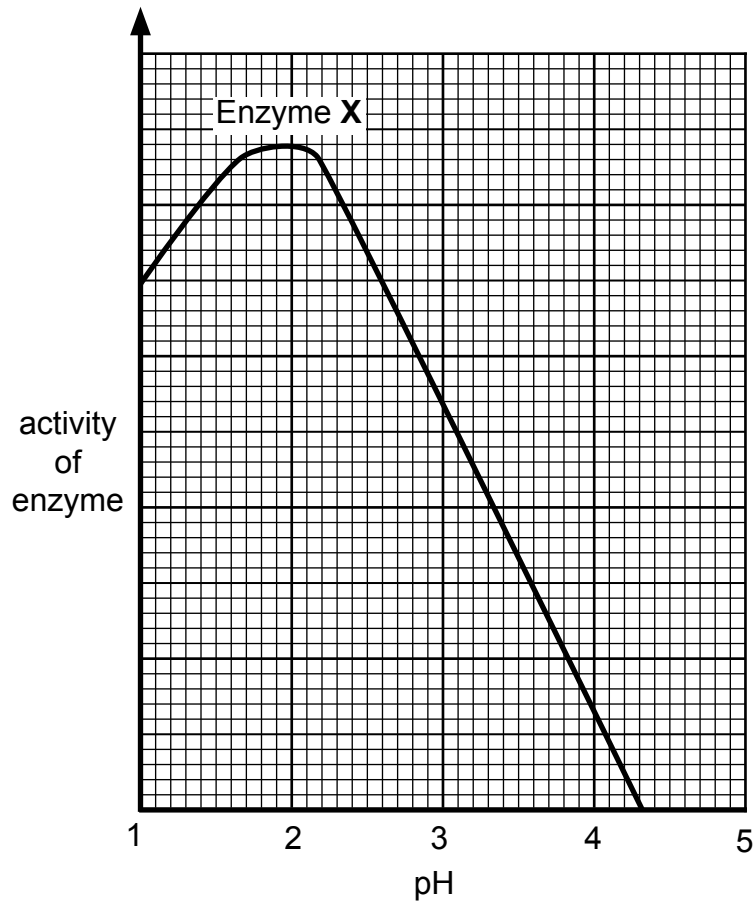
positive result .....

.....

.....

[3]

- (c) Fig. 2.1 shows the results of an investigation into the effect of pH on the activity of enzyme **X**.



**Fig. 2.1**

- (i) Use Fig. 2.1 to determine the optimum pH of enzyme **X**.

..... [1]

- (ii) Name the part of the alimentary canal in which enzyme **X** will be most active.

..... [1]

- (iii) Use your knowledge of the effects of pH on the activity of enzymes to explain why enzyme **X** is only active in the part mentioned in (i) and not in other parts of the alimentary canal.

.....

.....

.....

.....

.....

.....

[3]

**[10]**

**3** State the functions of the following components of blood.

(i) lymphocyte

.....  
 .....

[1]

(ii) phagocyte

.....  
 .....

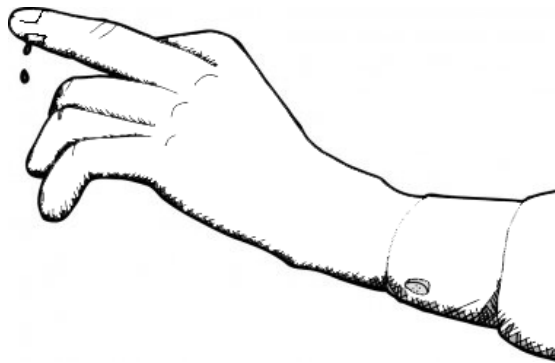
[1]

(iii) red blood cell

.....  
 .....

[1]

**(b)** Simson accidentally cut his finger with a knife as shown in Fig. 3.1, while he was helping his mother to chop vegetables in the kitchen. His finger bled for three minutes and stopped.



**Fig. 3.1**

Describe the process that caused his blood to stop flowing out of the cut.

.....  
 .....  
 .....  
 .....  
 .....  
 .....

[3]

(c) Outline the functions of blood plasma.

.....

.....

.....

.....

.....

.....

.....

.....

[4]

[10]

4 Germination is part of the process leading to seeds developing into new plants.

- (a) Describe how **one** named environmental condition affects the germination of seeds.

environmental condition .....

effect .....

.....

.....

[2]

- (b) Fig 4.1 shows responses in **E**, **F** and **G** seedlings to unequal distribution of light in seedlings.

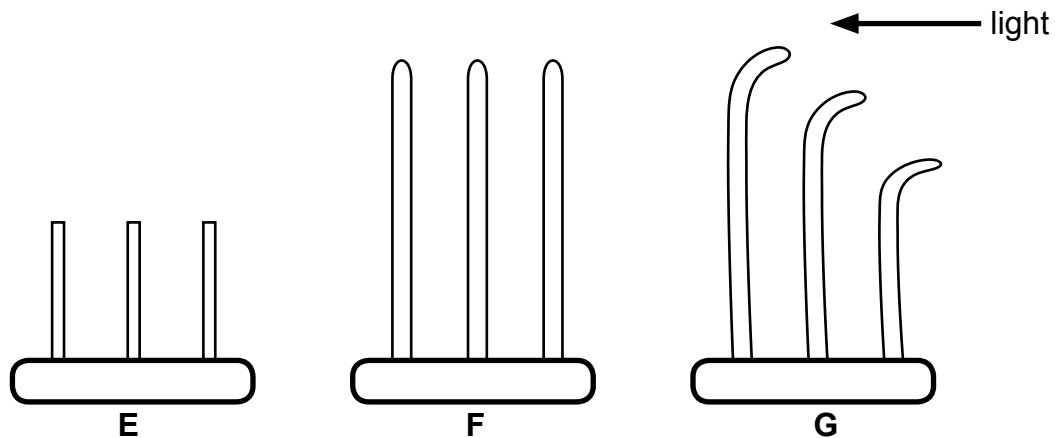


Fig. 4.1

- (i) Name the response shown by seedlings in **G**.

.....

[1]

- (ii) Name the chemical substance responsible for the response shown by seedlings in **G**.

.....

[1]



- (iii) Complete Table 4.1 to suggest what was done to each seedlings in **E**, **F** and **G**, the effect on the concentration of the growth substance and the result.

**Table 4.1**

	<b>seedling in E</b>	<b>seedling in F</b>	<b>seedling in G</b>
what happened	tips have been removed	..... .....	..... .....
effect on the concentration of growth substance	..... .....	equal concentrations of growth substance on both sides	..... .....
result	..... .....	..... .....	the cells on the darker side of the stems grow longer

[6]

[10]

- 5 Fig. 5.1 shows the structures involved in a reflex arc.

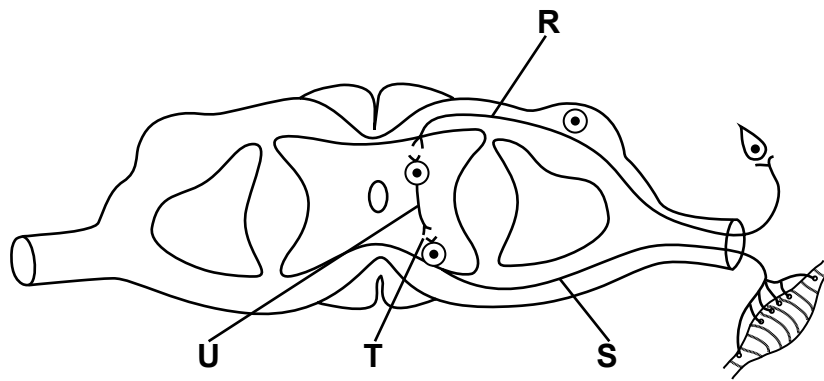


Fig. 5.1

- (a) (i) Identify the parts labelled **R – U** in Fig 5.1.

**R** .....

**S** .....

**T** .....

**U** .....

[4]

- (ii) Define *reflex action*.

.....  
 .....  
 .....  
 .....

[2]

- (iii) Name the **two** muscles of the iris that control the size of the pupil.

.....  
 .....

[2]

- (b) Describe the effects of alcohol on the release of the neurotransmitter substances.

.....  
 .....  
 .....  
 .....

[2]

[10]

- 6 Fig. 6.1 shows the fusion of nuclei from a male gamete and a female gamete.

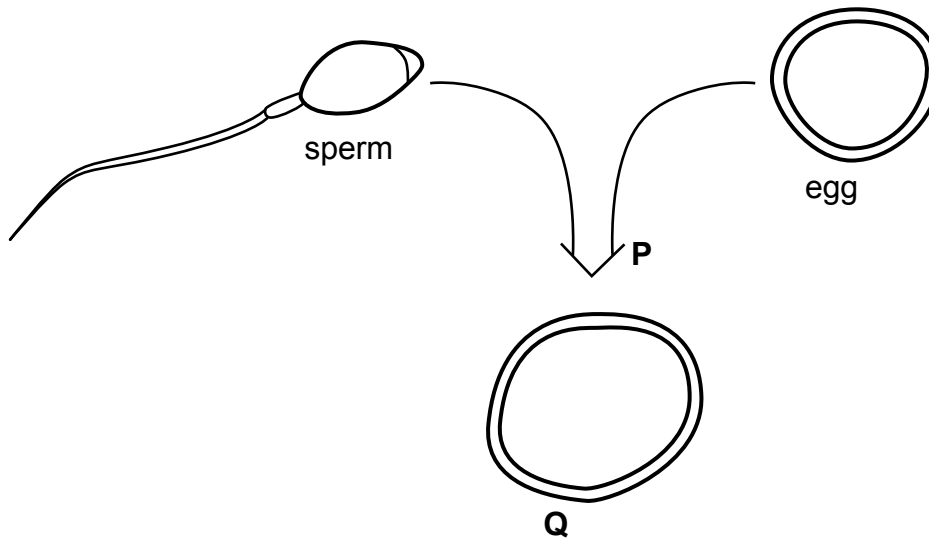


Fig. 6.1

- (a) Name the type of cell division which gave rise to the sperm cell.

..... [1]

- (b) (i) State the name of process **P** and structure **Q**.

**P** .....

**Q** ..... [2]

- (ii) Name the contraceptive method that can prevent pregnancy after the formation of **Q** and describe how this method works.

.....  
 .....  
 .....  
 ..... [2]

- (c) Structure **Q** will develop into an embryo.

- (i) Outline what happens to the embryo in the early stages and towards the end of pregnancy.

.....  
 .....  
 .....  
 .....  
 .....  
 ..... [3]

(ii) Describe the role of the umbilical cord during pregnancy.

.....

.....

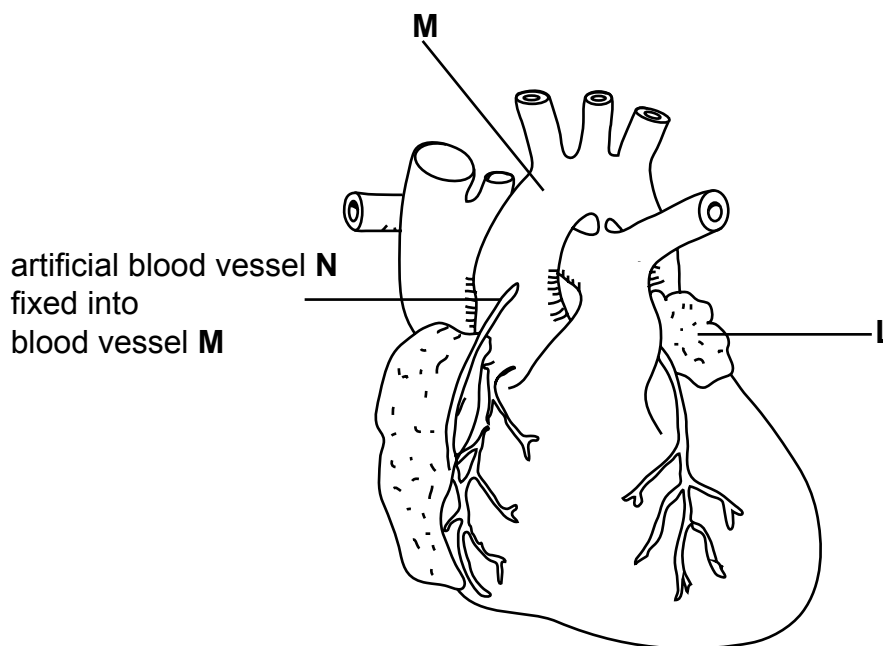
.....

.....

[2]

**[10]**

- 7 Fig. 7.1 shows how an artificial blood vessel can be used to by-pass a blocked blood vessel.



**Fig. 7.1**

- (a) (i) Name the blocked blood vessel **M** in Fig 7.1.

..... [1]

- (ii) Identify structures **L** and **M** on Fig. 7.1.

**L** .....

**M** ..... [2]

- (iii) Name a component of the diet that can cause a blockage in the blood vessel.

..... [1]

- (b) Sometimes, instead of using an artificial blood vessel, a vein taken from elsewhere in the body may be used.

Suggest **two** ways in which a vein might not be as suitable for carrying blood to the heart muscles as blood vessel **M** before it was blocked.

.....  
 .....  
 .....  
 ..... [2]

- (c) Name **two** other surgical procedures that can be used to treat blocked blood vessels.

.....  
.....

[2]

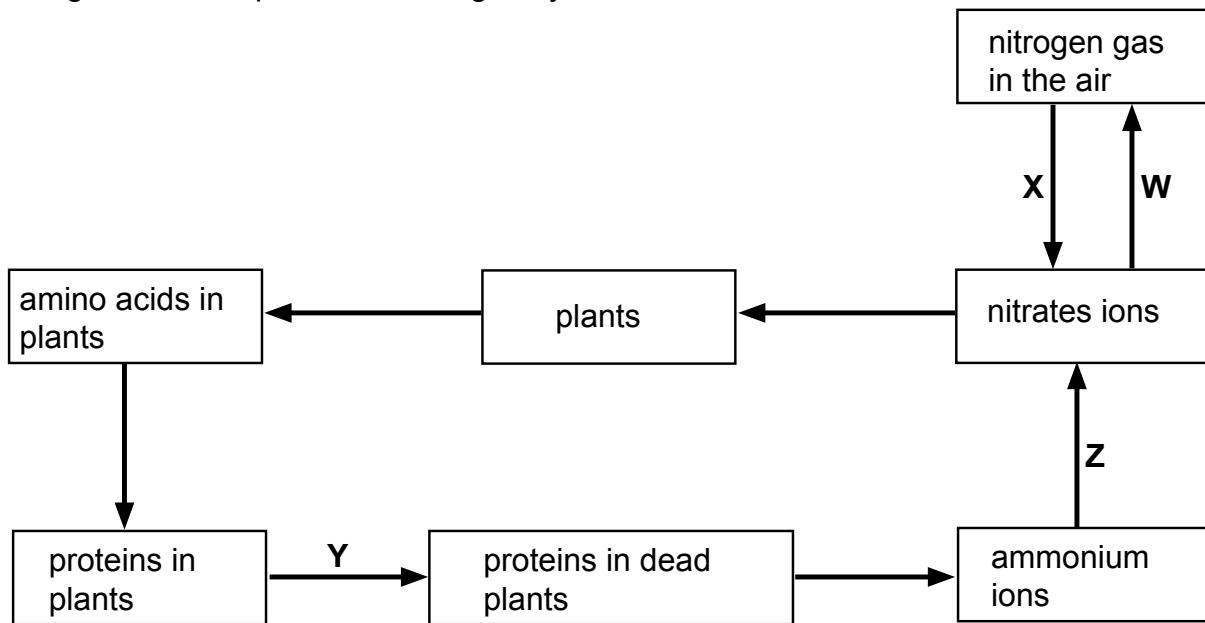
- (d) Describe **two** functions of the lymphatic system.

1 .....  
.....  
2 .....  
.....

[2]

[10]

8 Fig. 8.1 shows part of the nitrogen cycle.



**Fig. 8.1**

(a) Name the processes labelled **W**, **X**, **Y** and **Z** in Fig. 8.1.

Write your answers in Table 6.1.

letter	process
<b>W</b>	
<b>X</b>	
<b>Y</b>	
<b>Z</b>	

[4]

(b) Nitrogen can be made available in the form of nitrogen-containing fertilisers.

Describe the possible effects of using nitrogen-containing fertilisers on the environment.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[5]

- (c) State **one** human activity that is increasing the amount of carbon dioxide in the atmosphere.

..... [1]

[10]