Candidate Name	School Name

JUNIOR SECONDARY SEMI-EXTERNAL EXAMINATION

LIFE SCIENCE

2220/1

WRITTEN PAPER

2 hours 15 minutes

Marks 130

2018

Additional Materials: Non-programmable calculator
Soft pencil

INSTRUCTIONS AND INFORMATION TO CANDIDATES

- Write your Candidate Name and School Name in the spaces at the top of this page.
- Write your answers on the Question Paper.
- Answer **all** questions.
- Write in dark blue or black pen.
- Use a pencil for diagrams, graphs or rough working.
- Do not use correction fluid.
- You may use a non-programmable calculator.
- The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
Section A	
Section B	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
TOTAL	

Marker	
Checker	

This document consists of **26** printed pages.

Republic of Namibia

MINISTRY OF EDUCATION, ARTS AND CULTURE

[Turn over

SECTION A

- Answer **all** questions.
- For each question there are four possible answers, **A**, **B**, **C** and **D**. Choose the **one** you consider correct and encircle your choice.

Example

The skin kills pathogens by secreting

A acid.

B antigens.

(**C**) antiseptic oil.

D enzymes.

---

1 The actual size of an organism is 30 mm, and its drawing size is 150 mm. What is the magnification of the organism?

A X 0.5

B X 2

C X 5

D X 6

2 The amount of light reaching a specimen is controlled by which part of a microscope?

A diaphragm

B focusing knob

C nosepiece

D objective lens

3 Which one best describes the correct labelling of drawings?

A Label lines may be omitted by writing directly on the drawing.

B Label lines may cross each other.

C Label lines need to have arrows at the end.

D Label lines should touch the appropriate part.

4 Which of the following instruments can be used to observe temperature?

A hand lens

B microscope

C telescope

D thermometer

5 Which statement defines taxonomy?

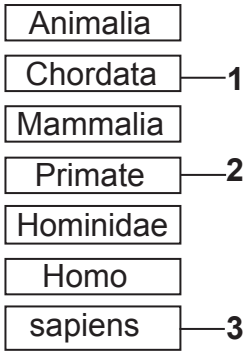
A A branch of biology that deals with human physiology.

B A branch of biology that deals with naming fish species only.

C A branch of biology that deals with naming and identification of living things.

D A branch of biology that deals with the identification of non-living things.

6 The diagram shows the levels of classification of a human.
Which levels of classification are represented by **1**, **2** and **3**?



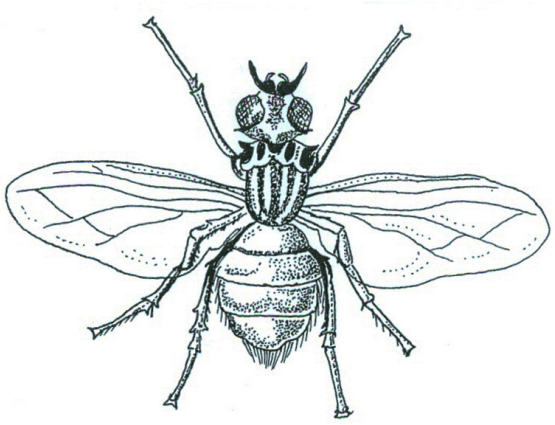
A kingdom, class, species

B kingdom, family, species

C phylum, order, genus

D phylum, order, species

7 The diagram shows an animal.



Use the key to identify the animal.

1	wings present	go to 2	
	wings absent	go to 3	
2	one pair of wings	animal	**A**
	two pairs of wings	animal	**B**
3	legs, three pairs	animal	**C**
	legs, four pairs	animal	**D**

8 Which cell organelle is responsible for the release of energy in plant and animal cells?

A cell membrane

B mitochondria

C nucleus

D vacuole

9 Which cell organelle is a lipid bilayer?

A cell membrane

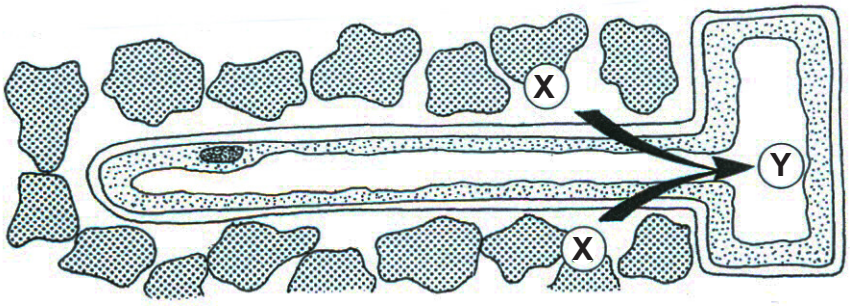
B cell wall

C mitochondria

D nucleus

10 The arrows in the diagram show the movement of water into a root hair cell from **X** to **Y**.

What causes this movement of water?



A A higher water potential at **X** than at **Y**.

B A lower water potential at **X** than at **Y**.

C A higher water potential at **Y** that at **X**.

D A lower water potential at both **Y** and **X**.

11 Which structure helps to carry some large molecules of organic substances through cell membranes?

A hydrophilic head

B hydrophobic tail

C lipid layer

D protein

12 A dicotyledonous plant has

A an adventious root system.

B a tap root system.

C one seed leaf.

D parallel veins.

13 Skin covered with feathers is the external diagnostic features of

A birds.

B fish.

C mammals.

D reptiles.

14 Which kingdom has members that have bodies made from only one cell that does not have a nucleus?

A Animalia

B Fungi

C Prokaryotes

D Protista

15 The classification of vertebrates into five groups is based on differences in the regulation of body temperature, type of reproduction and the

A method of movement.

B number of limbs.

C type of body covering.

D type of skeleton.

16 Which carbohydrate gives food a solid property allowing the muscles of the gut to push the food along?

A cellulose

B glucose

C starch

D sucrose

17 Proteins are large molecules made up of a long chain of smaller molecules called

A amino acids.

B fats.

C maltose.

D sucrose.

18 Identify a food source that is rich in vitamin C.

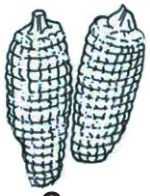
citrus

A

oily fish

B

maize



C

eggs

D

19 Which feature is a characteristic of the gaseous exchange surface in the alveoli?

A few blood capillaries
B moist inner lining
C small surface area
D thin cell wall

20 The risk of coronary heart disease can be reduced by

A eating food high in fats.
B exercising regularly.
C experiencing stress.
D smoking cigarettes.

21 Which component is the liquid part of blood?

A plasma
B platelets
C red blood cells
D white blood cells

22 Through what process does excess water leave the body?

A drinking
B eating
C sweating
D urinating

23 Identify the waste product released by the lungs.

A carbon dioxide
B excess salts
C urea
D uric acids

24 The central nervous system consists of the

A brain only.

B brain and spinal cord.

C spinal cord only.

D peripheral nerves.

25 What is the long-term effect of alcohol abuse on the body?

A brain damage

B goitre

C liver damage

D lung cancer

26 Which of the following explains the role of insulin in the body?

A It controls blood sugar levels.

B It controls growth.

C It controls water balance.

D It prepares the body for action.

27 Which line correctly matches a type of muscle with where it is found?

	type of muscle	**where found**
A	skeletal	biceps
B	skeletal	heart
C	smooth	triceps
D	smooth	heart

28 In males, the reproductive system consists of all of the following, **except**

A the bladder.

B the epididymis.

C the penis.

D the testis.

29 The term conception refers to

A the cellular division of the fertilised egg.

B the fusion of the sperm and egg cell.

C the implantation of the fertilised egg.

D the release of the sperm cell and egg cell.

30 Which activity would reduce CFCs?

A using refrigerators

B using spray cans that are ozone friendly

C using polystyrene containers

D using air conditioners

[30]

SECTION B

For Examiner's Use

- Answer **all** the questions in Section B.
- Use a pencil when making drawings or drawing graphs.

1 Fig. 1.1 shows the life cycle of the malaria parasite.

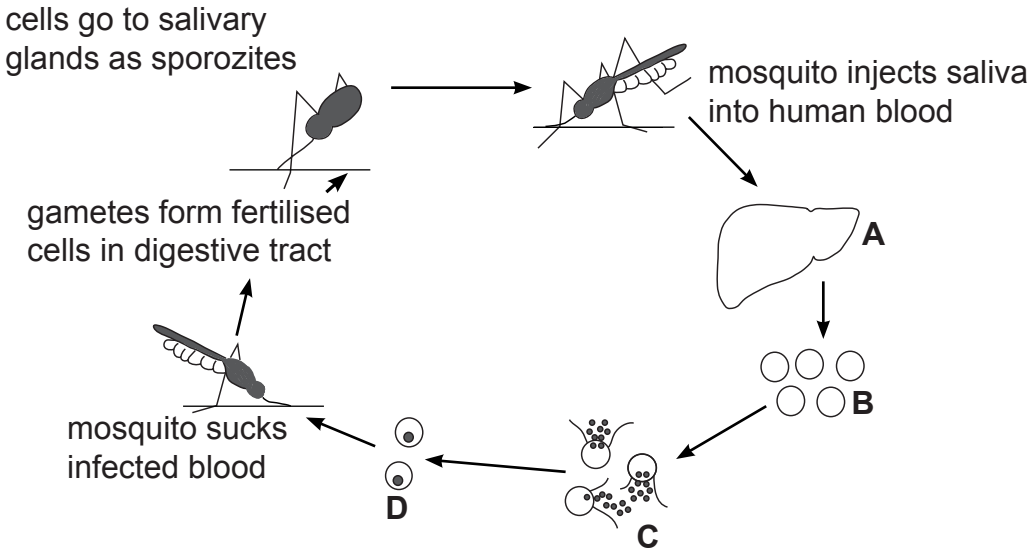


Fig. 1.1

(a) State the name of the protozoan that causes malaria.

..... [1]

(b) Describe what happens at stage **A** and stage **C**.

Stage **A** .....

.....

Stage **C** .....

..... [2]

(c) List **two** symptoms of malaria.

1 .....

2 ..... [2]

(d) Name **one other** infectious disease that is common in Namibia.

..... [1]

For Examiner's Use

(e) The human body can be made immune to infections/infectious diseases such as measles by immunisation.

(i) Define the term *immunisation.*

.....

.....

.....

..... [2]

(ii) Name the preparation of treated pathogens that is injected during immunisation.

..... [1]

(iii) Which blood cells are stimulated by a vaccination?

..... [1]

[10]

For Examiner's Use

2 (a) State the level of classification for

(i) chordata.....

(ii) plantae.....

(iii) reptiles..... [3]

(b) With reference to the scientific name *Musca domestica*, explain the term binomial system.

.....

.....

.....

.....

.....

..... [3]

(c) Outline **two** sources of characteristics (principles) that are used to classify organisms.

1.....

.....

2.....

..... [2]

(d) State **two** reasons why classifying organisms is important.

1.....

.....

2.....

..... [2]

[10]

For Examiner's Use

3 (a) Complete Table 3.1 to compare plant and animal cells. Use a tick (✓) to indicate when a structure is present. Use a cross (x) to indicate the absence of a structure.

Table 3.1

cell structure	plant cell	animal cell
cell wall		
cytoplasm		
large vacuole		

[3]

(b) Figure 3.1 shows a plant cell.

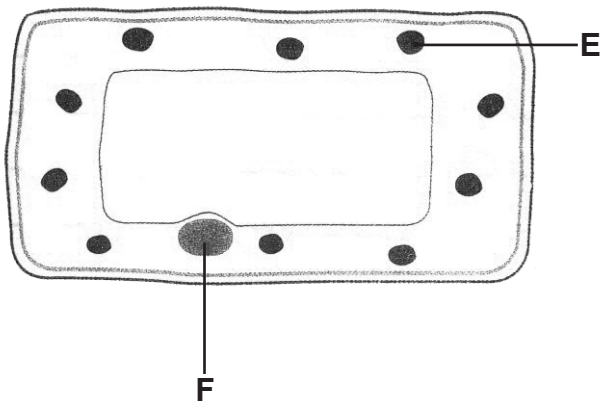


Fig. 3.1

(i) Identify the part labelled **E**.

..... [1]

(ii) State the function of the part labelled **F**.

..... [1]

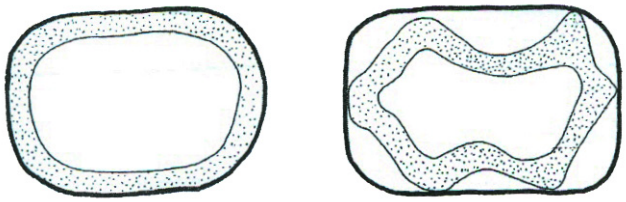
(iii) State why the cell in Fig. 3.1 can be classified as a eukaryotic cell.

.....

..... [1]

For Examiner's Use

(c) Fig. 3.2 shows two plant cells after having been placed in different solutions.



G **H**

Fig. 3.2

(i) Which cell, **G** or **H**, was placed in pure water?

..... [1]

(ii) Which cell is turgid?

..... [1]

(iii) Name the process that has taken place in both **G** and **H**.

..... [1]

(iv) State the significance of the process mentioned in **(c) (iii)**.

..... [1]

[10]

4 Fig. 4.1 shows organisms belonging to one of the five kingdoms.

Fig. 4.1

(a) (i) Identify the kingdom represented in Fig. 4.1.

..... [1]

(ii) Outline **two** characteristics that are unique to the kingdom represented in Fig. 4.1.

1.....

.....

2.....

..... [2]

(b) Fig. 4.2 shows two flowering plants.

For Examiner's Use

I **J**

Fig. 4.2

(i) Identify the sub-class that **I** and **J** belong to.

I.....

J..... [2]

(ii) Complete Table 4.1 to compare the differences that are **visible** between the two plants **I** and **J**.

Table 4.1

diagnostic features	**I**	**J**
roots		
leaves		

[2]

(c) Fig. 4.3 shows examples of organisms belonging to chordata.

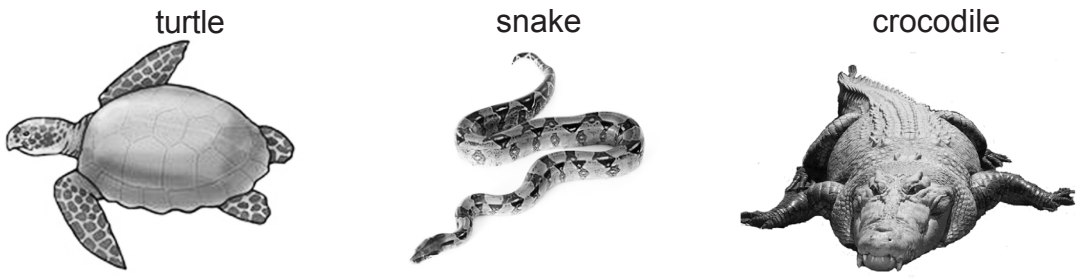


Fig. 4.3

(i) Name **one** diagnostic feature that is unique to chordata.

..... [1]

(ii) Write the class that the organisms in Fig. 4.3 belong to.

..... [1]

(iii) List **one** diagnostic feature of the class that the organisms in Fig. 4.3 belong to.

..... [1]

[10]

5 Fig. 5.1 shows signs/symptoms of two deficiency diseases.

For Examiner's Use

1 **2**

Fig. 5.1

(a) Name the deficiency disease in **1**.

..... [1]

(b) List **two** nutrients needed to prevent the deficiency disease in **2**.

1 .....

2 .....

..... [2]

(c) State why iron is needed in the body.

.....

..... [1]

(d) From the list, select **two** organic nutrients.

water **carbohydrates** **protein** **mineral salts** **fat** **vitamins**

1 .....

2 ..... [2]

(e) A serving of this cereal is prepared by adding 40 g of cereal to 150 ml of skim milk.

nutritional constitruent	**per 40 g serving**	**per 40 g serving with 150 ml of skim milk**
Energy	636 kJ	851 kJ
protein	3 g	8 g
sugar	3 g	3 g
starch	31g	39 g
fat	0.5 g	0.5g
fibre	1 g	1 g
sodium	360 mg	438 mg
potassium	32 mg	281 mg
magnesium	4 mg	21 mg
phosphorous	16 mg	168 mg
zinc	0.1 mg	1 mg

(i) How much energy is provided by the skim milk?

..... [1]

(ii) How much fat is provided by the skim milk?

..... [1]

(iii) List the building blocks of fats.

..... [1]

(iv) Which constituent gives more zinc, the cereal or the milk?

..... [1]

[10]

6 Fig. 6.1 shows the exchange of gases in an alveolus.

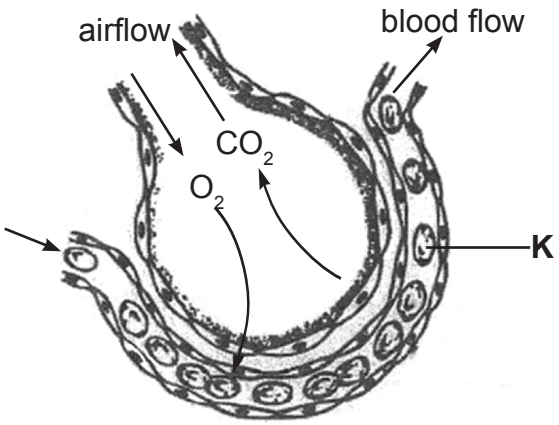


Fig 6.1

(a) By which process do gases move in and out of the blood?

..... [1]

(b) Name cell **K**.

..... [1]

(c) Discuss how the parts of the human gaseous exchange surfaces listed, is adapted and helps to ensure efficiency in gaseous exchange.

(i) alveoli .....

.....

.....

..... [2]

(ii) blood capillaries.....

.....

.....

..... [2]

(d) Explain why the rate of breathing increases during exercise.

.....

.....

..... [2]

For Examiner's Use

(e) Discuss how smoking affects the breathing system.

.....

.....

..... [2]

[10]

7 Fig. 7.1 shows the diagram of the human heart.

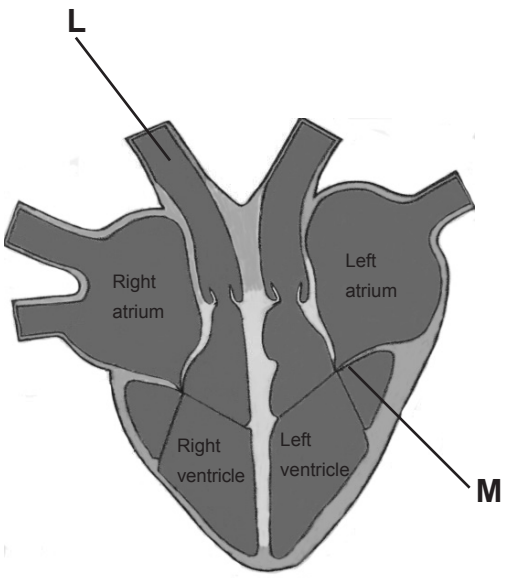


Fig. 7.1

(a) Identify the blood vessel labelled **L**.

..... [1]

(b) The heart has a wall separating the right and left sides of the heart.

Why is this wall necessary?

.....

..... [1]

(c) What are the main functions of the atria and ventricles?

atria .....

.....

ventricles .....

..... [2]

(d) Draw arrows on Fig. 7.1 to show the direction of blood flow in the left side of the heart. [2]

(e) Damaged heart valves can be replaced.

(i) Identify the valve labelled **M**.

..... [1]

(ii) Why are heart valves necessary?

..... [1]

(iii) Where else in the circulatory system are valves necessary?

..... [1]

(iv) Suggest why valve replacement surgery can be risky.

.....

..... [1]

[10]

For Examiner's Use

8 Fig. 8.1 shows part of the excretory system of a mammal.

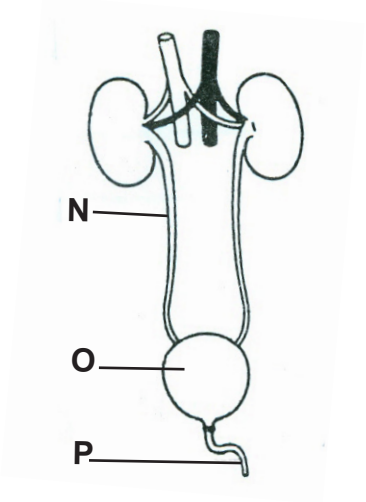


Fig. 8.1

(a) Identify the parts labelled **N** and **P**.

N .....

P..... [2]

(b) State the function of part **O**.

.....

..... [1]

(c) Explain why the excretory system in Fig. 8.1 is an example of an organ system.

.....

..... [1]

(d) On the table, list three main ways in which a person loses water and, for each, state why it is important.

method	**importance**
1	....
2	....
3	....

[6]

[10]

9 Fig. 9.1 shows the human male reproductive system.

For Examiner's Use

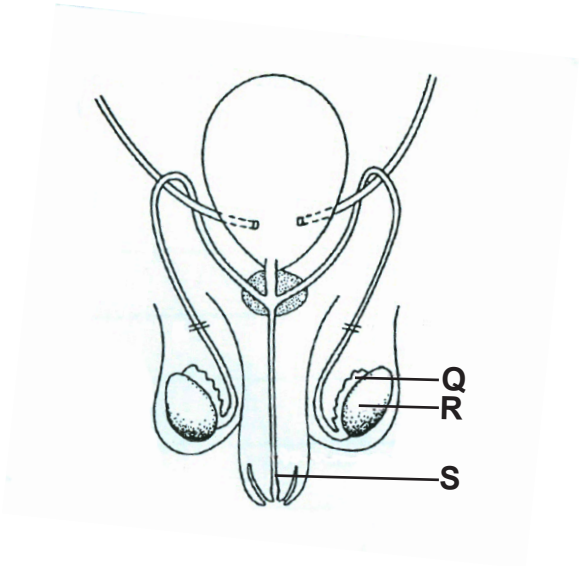


Fig. 9.1

(a) (i) State the name of the part labelled **Q**.

..... [1]

(ii) Name the hormone produced in part **R**.

..... [1]

(iii) State the functions of the part labelled **S**.

1.....

2..... [2]

For Examiner's Use

(b) Fig. 9.2 A is a graph showing the thickness of the lining of the uterus of a woman over a 28-day cycle. Fig. 9.2 B represents the 28 days of the cycle in Fig. 9.2 A.

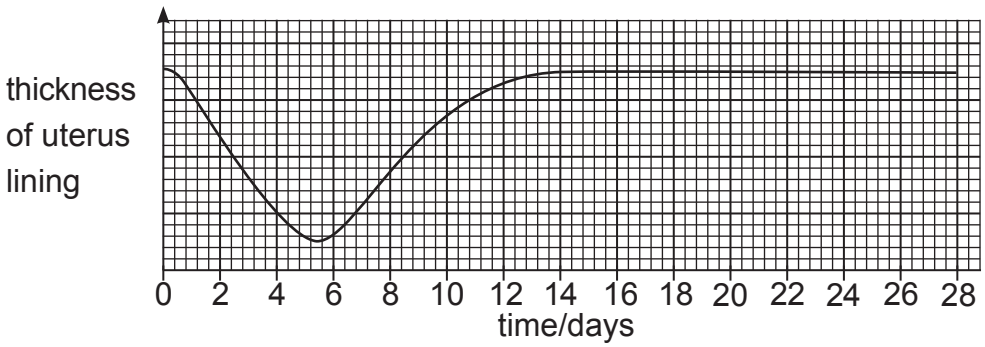


Fig. 9.2 A

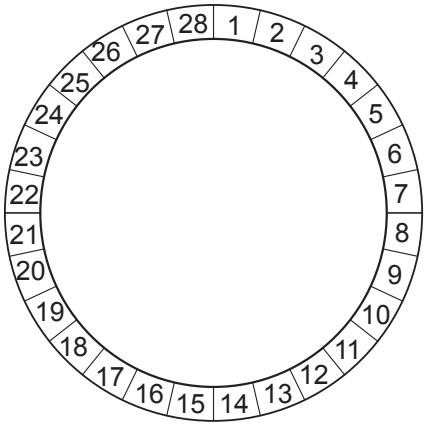


Fig. 9.2 B

On Fig. 9.2 B shade in and label

(i) the days during which menstruation occurs.

(ii) the day on which an ovum is likely to be released from an ovary. [2]

(c) Why would sexual intercourse between days **6** and **10** be unlikely to lead to pregnancy?

.....

..... [1]

(d) If fertilisation occurs, what part is played by the uterus in the development of the embryo?

.....

.....

..... [3]

[10]

For Examiner's Use

10 (a) Distinguish between the greenhouse effect and global warming.

.....

.....

.....

..... [2]

(b) Choose **two** greenhouse gases from the words below.

water vapour ozone argon nitrogen carbon dioxide methane

1 .....

2 ..... [2]

(c) Fig. 10.1 shows a human activity that releases CFCs.

Fig. 10.1

List **three other** items whose use may release CFCs.

1 .....

2 .....

3 ..... [3]

(d) Discuss **one** way Namibians should prepare themselves for the effects of global warming.

.....

..... [1]

(e) Describe **two** ecological effects that global warming may have on Namibia.

1 .....

.....

2 .....

..... [2]

[10]