Candidate Number	Candidate Name

JUNIOR SECONDARY CERTIFICATE

LIFE SCIENCE 1220/1

WRITTEN PAPER 2 hours 15 minutes

Marks 130 **2017**

Additional Materials: Multiple-choice answer sheet
Non-programmable calculator
Soft clean eraser
Soft pencil (type B or HB)
Ruler

INSTRUCTIONS AND INFORMATION TO CANDIDATES

SECTION A

- Make sure that you receive the multiple-choice answer sheet with **your Candidate Number** on it to answer **Section A.**
- There are **thirty** questions.
- Answer **all** questions.

SECTION B

- Write your Candidate Number and Candidate Name in the spaces at the top of this page.
- Write your answers on the Question Paper in the spaces provided.
- 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 B	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
TOTAL	

Marker	
Checker	

This document consists of **27** printed pages.

Republic of Namibia

MINISTRY OF EDUCATION, ARTS AND CULTURE

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 record your choice in soft pencil on the multiple-choice answer sheet.
- If you want to change an answer, thoroughly erase the one you wish to delete.

---

1 Which statement best describes how HIV destroys the immune system?

A HIV attacks and destroys lymphocytes which produce antibodies.

B HIV attacks and destroys the red blood cells and antibodies.

C The virus attacks and destroys the lymphnodes and bone marrow.

D The virus attacks and destroys the platelets which clot blood.

2 The ELISA test shows the presence of the

A antibodies to HIV.

B antigens of HIV.

C HIV nucleic acid.

D HIV particles.

3 A student looks at a specimen through a microscope.

Which scientific process is carried out?

A classifying

B inferring

C measuring

D observing

4 Through which two lenses do light rays need to pass in order to magnify a specimen?

The lenses in

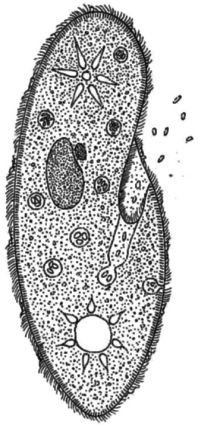
A the eye piece and the objective.

B the eye piece and the stage.

C the objective and the base.

D the tube and the stage.

5 The diagram shows a *Paramecium, magnified X150.*



Which calculation shows the **actual** length of the *Paramecium*?

A 52 x 150

B 52 ÷ 150

C 150 ÷ 52

D 150 + 52

6 Which is a principle of magnification?

A The closer the object, the lower the magnification.

B The further away the object, the stronger the magnification.

C The stronger the magnification, the larger the area viewed.

D The stronger the magnification, the smaller the area viewed.

7 Taxonomy is

A a written set of options used to identify the class.

B identifying and naming living things.

C naming organisms using two-word latin names.

D the slow and a gradual changes in characteristics of a species.

8 What is the species name for the animal shown?

A *burchelli*

B *Equus*

C mammal

D zebra

9 Use the key to identify the leaf.

1	leaf stalk present	go to 2
	leaf stalk absent	**A**
2	main vein present	go to 3
	main vein absent	**B**
3	parallel veins	**C**
	network of veins	**D**

10 What type of identification key uses pairs of contrasting descriptions that compare features of a particular organism or group of organisms?

A binomial

B dichotomous

C dicotyledon

D monocotyledon

11 Which two are examples of unicellular organisms?

A bacteria and virus

B bacteria and yeast

C bread mould and virus

D bread mould and yeast

12 A piece of potato measuring 50 mm in length was placed in pure water. When it was removed after two hours, it measured 54 mm in length.

Which process was responsible for this change in the length of the potato?

A active transport

B diffusion

C facilitated diffusion

D osmosis

13 Mitochondria are

A biconcave-shaped structures containing chlorophyll.

B rod-shaped organelles where respiration and transfer of energy takes place.

C spaces filled with a fluid rich in sugar and salt solutions.

D tough rigid coverings of plant cells made of cellulose.

14 The process of absorption of carbon dioxide from air by plant leaves happen through

A active transport.

B diffusion.

C osmosis.

D transpiration.

15 Plants are characterised as being

A autotrophic and multicellular.

B autotrophic and unicellular.

C heterotrophic and multicellular.

D heterotrophic and unicellular.

16 Which kingdom is made up of thread-like hyphae rather than cells?

A Animals

B Fungi

C Monera

D Protoctista

17 The amount of energy a person needs in their diet depends on the amount of energy they use each day. This is turn depends on

A the activity level of the job they do.

B the high amount of energy contained in fats.

C the number of children they have.

D the relatively low amount of energy contained in proteins.

18 Simple elements or compounds that are needed by the body and are not made by plants, are called

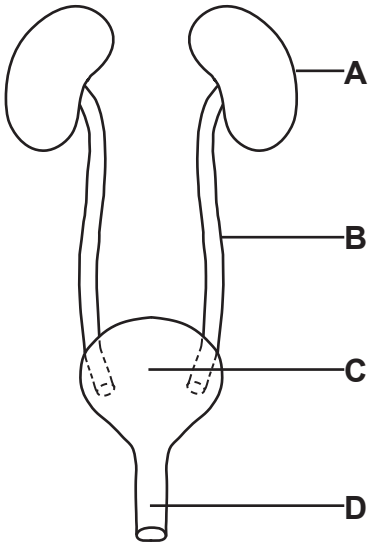
A carbohydrates.

B inorganic nutrients.

C organic nutrients.

D proteins.

19 Which labelled structure carries urine from the bladder out of the body?



20 If water lost by the body on a hot day is not replaced,

A the cells burst due to excess water.

B the blood becomes diluted.

C the kidneys produce more urine.

D the body becomes dehydrated.

21 Which one forms part of the peripheral nervous system?

A brain

B nerves

C skull

D spinal cord

22 Which part of the brain is responsible for controlling heart beat, breathing and blood pressure?

A cerebellum

B cerebrum

C medulla oblongata

D motor neurone

23 Where are relay neurones located?

A effector

B receptor

C spinal cord

D spinal nerve

24 Which is a depressant drug?

A alcohol

B caffeine

C cocaine

D mandrax

25 Stimuli are detected by

A effectors.

B glands.

C muscles.

D receptors.

26 All of the following are functions of the skeleton **except**

A enabling movement.

B making muscles.

C protecting organs.

D providing support.

27 The presence of a mutation that rearranges an organism's chromosomes can be confirmed by

A eye-colour.

B finger prints.

C karyotype.

D phenotype.

28 A mutation that changes the number of chromosomes an individual has can result in

A albinism.

B baldness.

C color blindness.

D Down's syndrome.

29 When neither one of a pair of alleles is fully dominant over the other, this is called

A co-dominance.

B cross-dominance.

C non-dominance.

D unequal-dominance.

30 Scientists believe that evolution

A allowed organisms to feed on the same type of food.

B shows that living things were never related to each other.

C took place after individual organisms developed features that would help them survive.

D was brought about by the process called artificial selection.

SECTION B

For Examiner's Use

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

1 (a) (i) Match the components in column **A** with their immune functions in column **B**, using a **ruled lined**.

A
stomach
skin
white blood cells

B
keeps out bacteria
kills pathogens inside the body
kills pathogens ingisted with food

[3]

(ii) The trachea also has an immune function.

State the adaptation in the trachea that enables it to perform this immune function.

..... [1]

(iii) Explain the function of the adaptation you mentioned in **(a) (ii).**

.....

.....

..... [2]

(b) Immunisation is important in the prevention of infectious diseases.

(i) Outline **one** way in which infectious diseases are transmitted.

.....

..... [1]

(ii) Malaria is an example of a common infectious disease.

State the name of the parasite that causes malaria.

..... [1]

(iii) Name the kingdom to which the parasite mentioned in **(b) (ii)** belongs.

..... [1]

(iv) Explain why vaccination against an infectious disease like tuberculosis does not protect a person from an attack by measles.

.....

..... [1]

[10]

For Examiner's Use

2 **(a)** Complete the sentences below using the following words.

classes, family, genus, kingdoms

A **(i)** ..... is a category in the classification of organisms that consist of similar or closely related **(ii)** ..... In traditional classification schemes, phyla are grouped into **(iii)** ..... [3]

(b) Fig. 2.1 shows a cladogram of the domains of living organisms.

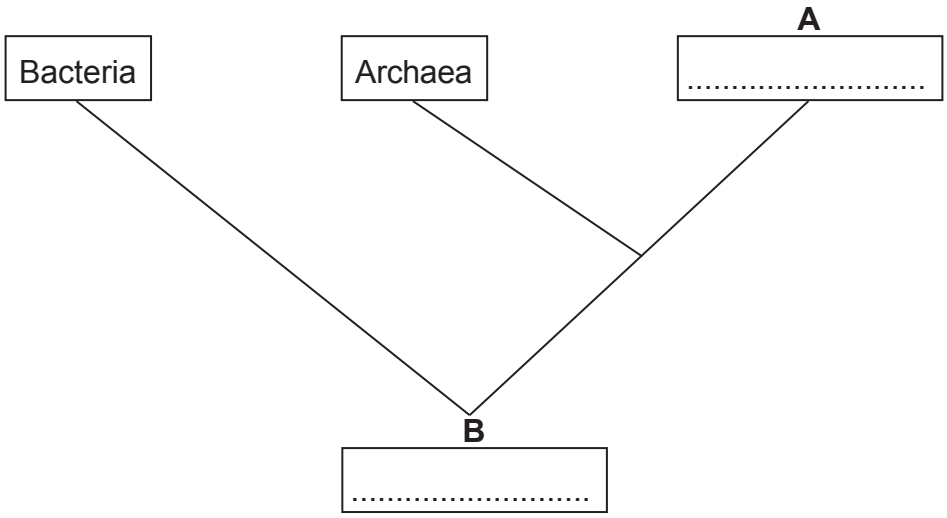


Fig. 2.1

(i) Label **A** and **B** in Fig. 2.1. [2]

(ii) Describe **one** distinguishing characteristic of Archaebacteria.

.....

..... [1]

For Examiner's Use

(c) Fig. 2.2 shows the relationships among various insects.

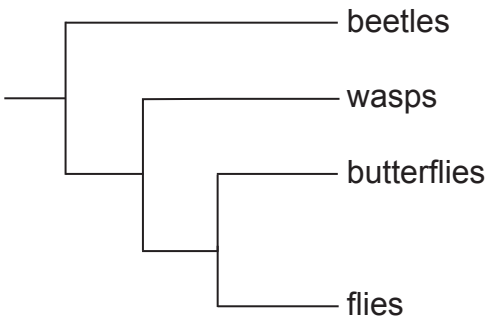


Fig. 2.2

List **two** conclusions that can be drawn about the relationship between butterflies and flies based on this cladogram.

1 .....

.....

2 .....

..... [2]

(d) Name **one** type of characteristic scientists may use to place organisms into groups.

..... [1]

(e) Explain why using common names are not used when classifying organisms.

.....

..... [1]

[10]

For Examiner's Use

3 Fig. 3.1 shows a root hair cell.

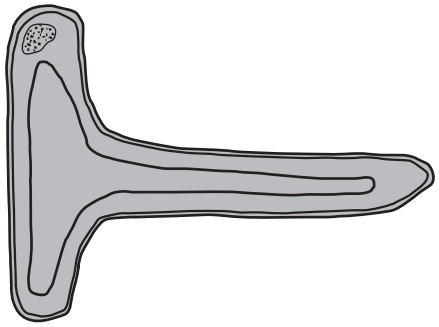


Fig. 3.1

(a) (i) Draw a large diagram of the root hair cell.

[3]

On the diagram label the parts using the **letter** indicated responsible for

(ii) controlling/regulating cell activities - letter **N**. [1]

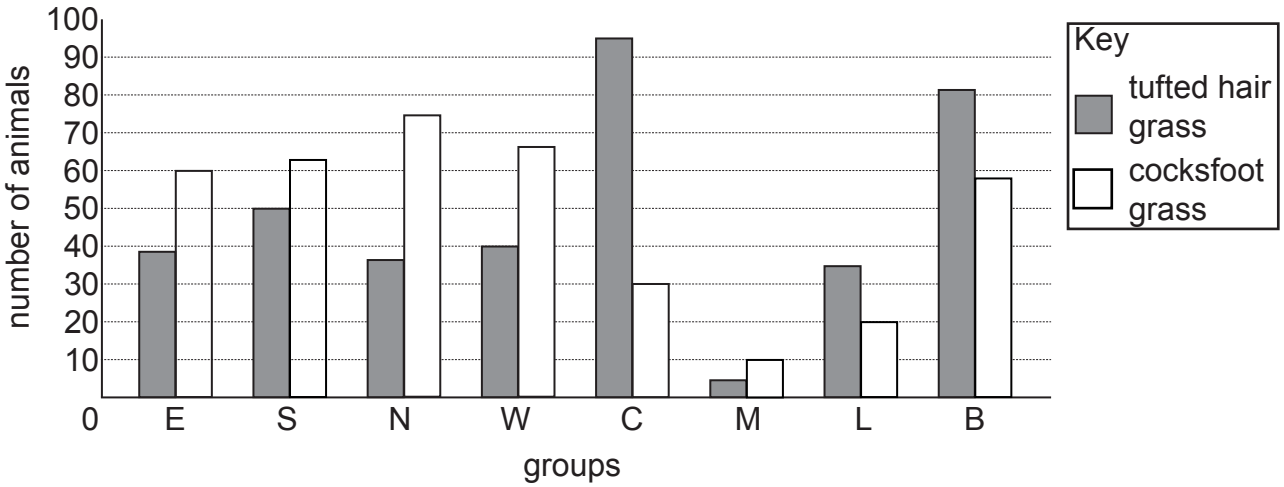
(iii) storing salts/pigments/sugars/waste - letter **V**. [1]

(iv) State the feature unique to the cell membrane that enables it to carry out the function of security in cells.

.....

..... [1]

(b) The animals found in tufted hair grass were compared with those in cocksfoot grass. The results are displayed in Fig. 3.2.



E = earthworms W = woodlice L = click beetle larvae
S = slugs C = centipedes B = butterfly and moth larvae
N = snails M = millipedes

Fig. 3.2

List the most numerous groups of animals in

(i) the tufted hair grass.

..... [1]

(ii) the cocksfoot grass.

..... [1]

(c) Which group of animals is found in almost the same numbers in both types of grasses?

..... [1]

(d) Which group of animals is twice as numerous in one type of grass compared to the other type?

..... [1]

[10]

For Examiner's Use

4 Fig. 4.1 shows the different levels of organisation in a human.

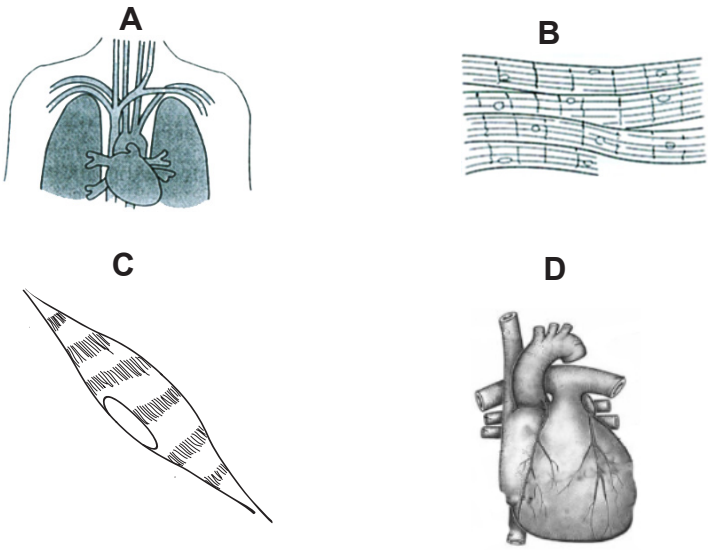


Fig. 4.1

(a) (i) Arrange the letters **A**, **B**, **C** and **D** in the correct order of increasing complexity.

..... [1]

(ii) Explain what is meant by the word *a cell*.

.....

..... [1]

(iii) Name the **two** types of cells found in living organisms.

1 .....

2 ..... [2]

(iv) Animal cells have plasma membranes.

Describe the structure of a plasma membrane.

.....

.....

.....

.....

.....

..... [3]

For Examiner's Use

(b) Fig. 4.2 shows a vertebrate.

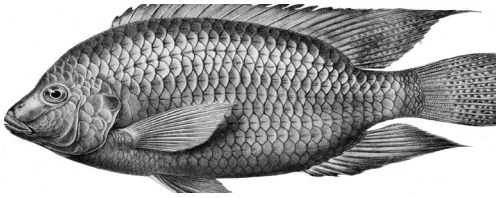


Fig. 4.2

(i) State **one** feature that is characteristic of this class of vertebrates.

..... [1]

(ii) List **one** adaptation of the *Tilapia* fish species to the Namibian environment.

.....

..... [1]

(iii) Fish is a source of protein.

State the deficiency disease that can result from a shortage of protein in one's diet.

..... [1]

[10]

For Examiner's Use

5 Fig. 5.1 shows a food guide pyramid.

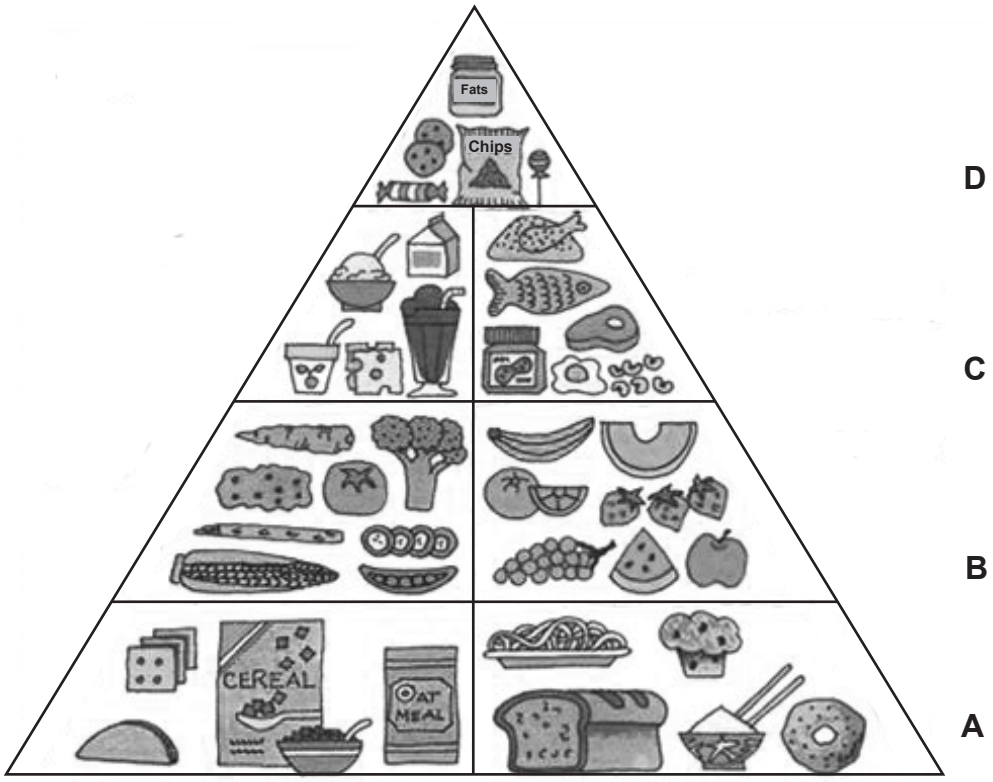


Fig. 5.1

(a) (i) State the food group in Fig. 5.1 which is a rich source of carbohydrates.

..... [1]

(ii) Identify the food group in Fig. 5.1 that is recommended for a person suffering from scurvy.

..... [1]

(iii) Give a reason to support your answer given in **(a) (ii)**.

.....

..... [1]

(b) Interpret the significance of positioning food group **D** at the top of the pyramid.

.....

..... [1]

For Examiner's Use

(c) Suggest **one** reason why

(i) children need more proteins.

..... [1]

(ii) a pregnant woman needs more proteins.

.....

..... [1]

(iii) an athlete needs more carbohydrates.

.....

..... [1]

(d) Most of the food we consume contain sodium and sodium chloride (salt) which is used for flavouring.

(i) Name the organ in the human body responsible for removing excess sodium chloride from the body.

..... [1]

(ii) Apart from the organ mentioned in **(d) (i)**, the skin also has an excretory function.

List **two** substances excreted by the skin.

1.....

2..... [2]

[10]

For Examiner's Use

6 Fig. 6.1 shows the human respiratory system.

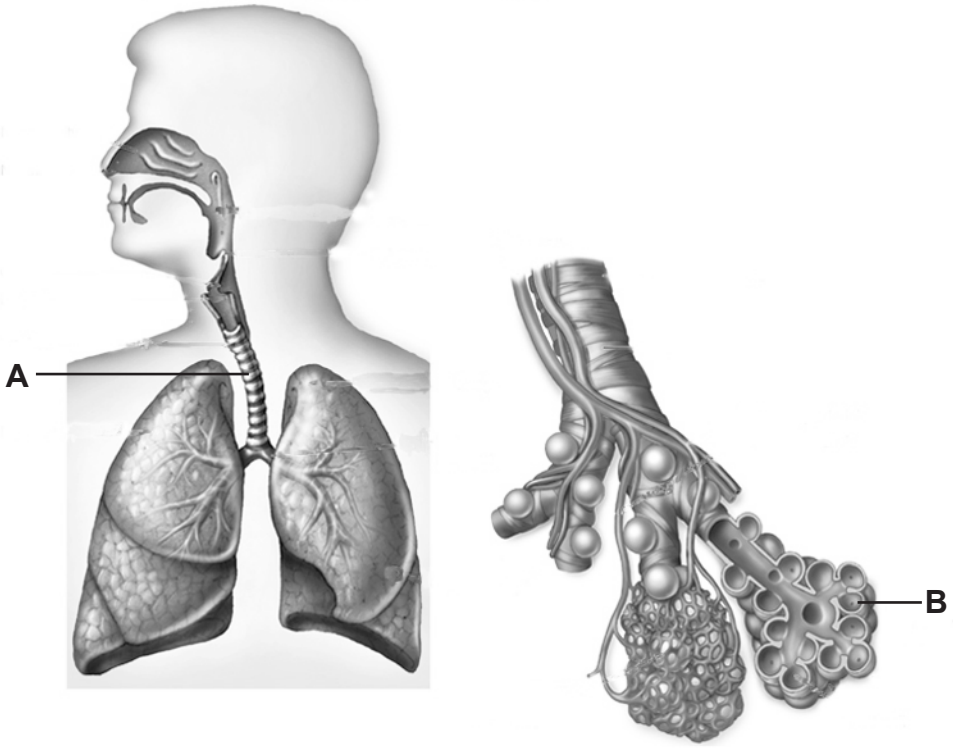


Fig. 6.1

(a) (i) Name the structures found in **A** that keep the air passages open for the flow of air.

..... [1]

(ii) Identify the part labelled **B**.

..... [1]

(iii) Explain the significance of having large numbers of structure **B**.

..... [1]

(iv) State what lines structure **B** on the inside and explain its significance for maintaining life.

What lines structure **B** .....

Significance .....

..... [2]

For Examiner's Use

(b) Nicotine from cigarette smoke affects the human respiratory system.

(i) Name **two other** harmful chemicals found in cigarette smoke.

1 .....

2 ..... [2]

(ii) List **two** negative effects of nicotine on the human body.

1 .....

.....

2 .....

..... [2]

(c) The rate of breathing becomes rapid, deep and noticeable during vigorous exercise.

Explain **one** reason why the breathing rate increases during vigorous exercise.

.....

..... [1]

[10]

For Examiner's Use

7 Fig. 7.1 shows the internal structure of the human heart.

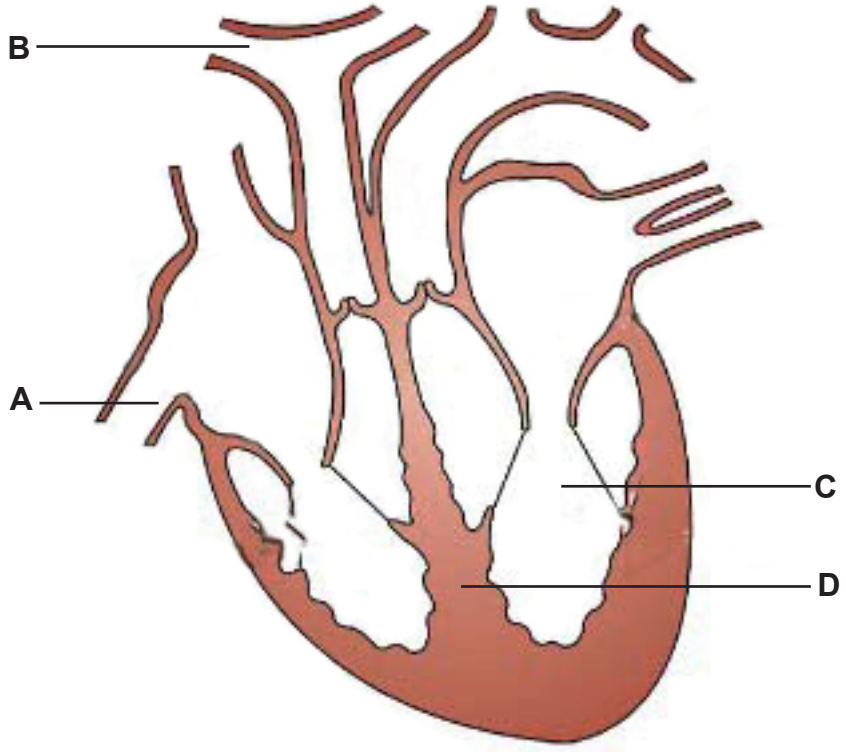


Fig. 7.1

(a) Identify the structures labelled **A** and **C**.

A .....

C ..... [2]

(b) Outline the functions of the parts labelled **B** and **D**.

B .....

.....

D .....

..... [2]

(c) **(i)** Name the blood vessel which supplies the heart muscle with oxygen.

..... [1]

(ii) Name the structure which could build up inside the blood vessel mentioned in **(c) (i)**.

..... [1]

For Examiner's Use

(d) (i) Adrenalin is secreted in a frightening situation to prepare the body for action.

State **one** effect it has on the heart.

.....

..... [1]

(ii) Explain how the effect adrenalin has on the heart helps, together with other organ systems in the body, to prepare the body for action in a frightening situation.

.....

..... [1]

(e) List **two** effector organs involved in nerve and hormonal control in the human body.

1 .....

2 ..... [2]

[10]

For Examiner's Use

8 Fig. 8.1 shows the female reproductive system.

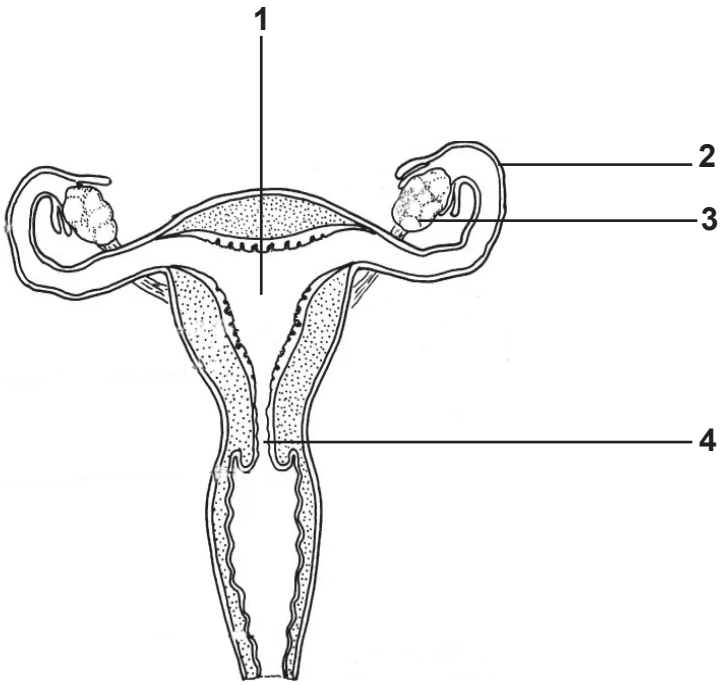


Fig. 8.1

(a) (i) Identify the part labelled **3**.

..... [1]

(ii) Explain how the part labelled **1** is adapted to perform its functions in the process of reproduction and birth.

.....

.....

.....

..... [2]

(iii) State the **number** of the part in which fertilisation takes place.

..... [1]

(iv) Discuss **two** functions of the placenta during pregnancy.

1.....

.....

2.....

..... [2]

For Examiner's Use

(b) The calender in Fig. 8.2 shows the dates of menstruation for Talishi in January and February.

January							February						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
			1	2	3	4							1
5	(6)	(7)	(8)	(9)	(10)	11	(2)	(3)	(4)	(5)	(6)	7	8
12	13	14	15	16	17	18	9	10	11	12	13	14	15
19	20	21	22	23	24	25	16	17	18	19	20	21	22
26	27	28	29	30	31		23	24	25	26	27	28	

Fig. 8.2

(i) How long is Talishi's menstrual cycle?

..... [1]

(ii) State the dates in January when Talishi is most likely to fall pregnant if she has unprotected sex.

..... [1]

(iii) Talishi uses the contraceptive pill.

List **one** disadvantage of using this method of contraception.

.....

..... [1]

(iv) Describe the role of oestrogen in the menstrual cycle.

.....

..... [1]

[10]

For Examiner's Use

9 Fig. 9.1 shows a structure found in the human body.

Fig. 9.1

(a) (i) Identify the structure in Fig. 9.1.

..... [1]

(ii) State the importance/function of the structure mentioned in **(a) (i)**.

..... [1]

(iii) State where in the human body the structure in Fig. 9.1 is found.

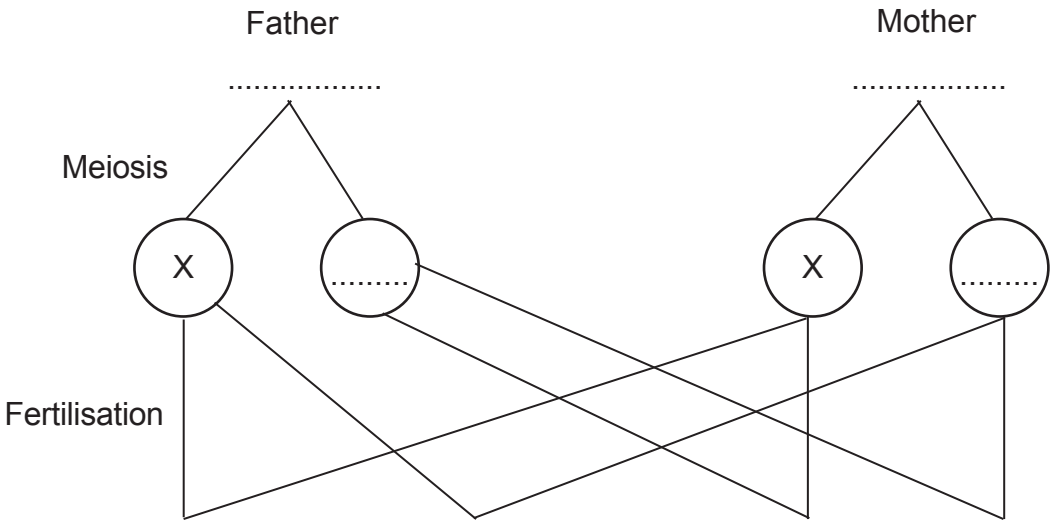
..... [1]

(iv) State the number of the structure in Fig. 9.1 found in a human egg cell.

..... [1]

For Examiner's Use

(b) Complete the genetic diagram in Fig. 9.2 to explain how the sex (gender) of a person can be determined.



.... [4]

Fig. 9.2

(c) A man and his wife both have brown eyes. They have two children. One of the children has blue eyes.

Discuss by referring to the terms recessive and/or dominant, how genetic variation of this nature can result.

.....

.....

.....

..... [2]

[10]

For Examiner's Use

10 Fig. 10.1 illustrates some ecological processes that take place on earth.

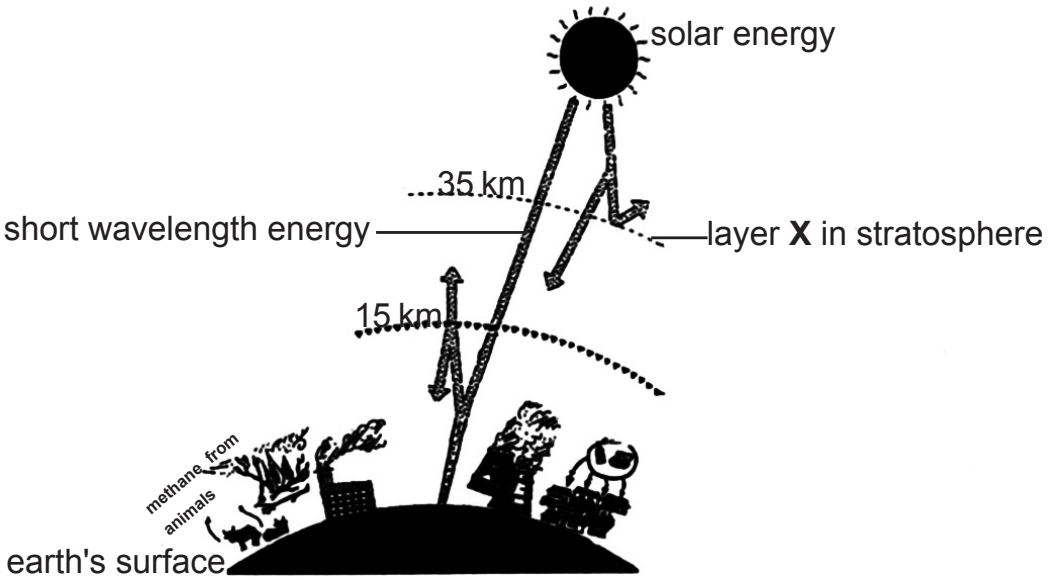


Fig. 10.1

(a) (i) Identify layer **X**.

..... [1]

(ii) Explain **two** importances of layer **X**.

1.....

.....

2.....

..... [2]

For Examiner's Use

(b) (i) State the name of the process given to the increase in the temperature of the earth's atmosphere.

..... [1]

(ii) Apart from CFC's list **two other** gases that contribute to the process mentioned in **(b) (i)**.

1.....

2..... [2]

(iii) Describe **two** ways in which the process mentioned in **(b) (i)** can affect the Namibian environment.

1.....

.....

2.....

..... [2]

(iv) Name **two** products that release CFC's.

1.....

2..... [2]

[10]