

Candidate Name	School Name
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# JUNIOR SECONDARY SEMI-EXTERNAL EXAMINATION

**LIFE SCIENCE**

**2220/1**

WRITTEN PAPER

2 hours 15 minutes

Marks 130

**2019**

Additional Materials: Non-programmable calculator  
Soft pencil (type B or HB)  
Ruler

## 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 B	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
<b>TOTAL</b>	
Marker	
Checker	

This document consists of **23** printed pages.



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

**SECTION A**

- 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 HIV is commonly diagnosed by testing

- A blood
- B faeces
- C urine
- D vaginal fluid

2 Which part of the immune system does HIV attack and what is its impact?

- A lymphocytes and increases the protective power of the immune system
- B lymphocytes and reduces the protective power of the immune system
- C phagocytes and increases the protective power of the immune system
- D phagocytes and reduces the protective power of the immune system

3 Influenza is primarily spread through

- A air
- B food
- C insect bites
- D water

4 In which organ of the human body does the malaria - causing plasmodium reproduce?

- A heart
- B liver
- C lung
- D pancreas

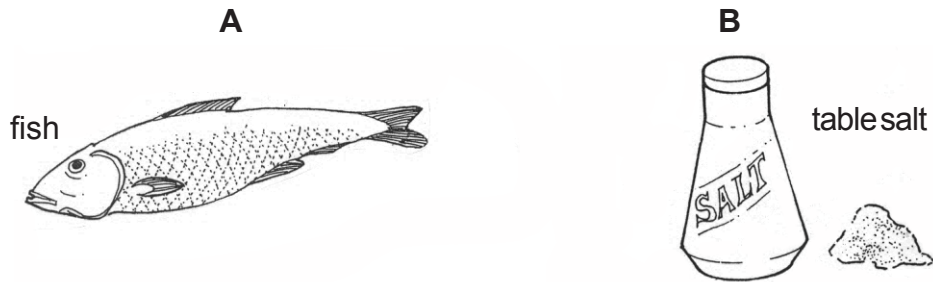
5 Which part of a microscope carries a slide with a specimen?

- A eye piece
- B fine knob
- C nose piece
- D stage

- 6 Which list correctly sequences levels of classification from the largest to the smallest?
- A genus, kingdom, phylum, species, order, family, class
  - B kingdom, phylum, class, order, family, genus, species
  - C order, family, genus, species, class, phylum, kingdom
  - D species, kingdom, phylum, class, genus, family, order
- 7 Evolution is explained in terms of....
- A extinction of species
  - B genetic similarity
  - C individual selection
  - D survival of the fittest
- 8 Which statement is correct about cell walls?
- A Controls the movement of substances in and out of cells.
  - B Is found in animal cells only.
  - C Is found in plant cells only.
  - D Is made of a rigid semi-permeable non-living cellulose material.
- 9 What is the function of mitochondria?
- A for photosynthesis
  - B gives shape to a cell
  - C release energy
  - D store sugar
- 10 Which kingdom is characterized by single-celled organisms only?
- A animal
  - B fungi
  - C plant
  - D prokaryotes
- 11 Which kingdoms include organisms that reproduce by means of spores?
- A animals and plants
  - B fungi and plants
  - C plants and protista
  - D protista and fungi

- 12** Which is a feature of dicotyledonous plants?
- A** fibrous roots
  - B** leaves with parallel veins
  - C** one seed leaf
  - D** two seed leaves
- 13** Which is an economic importance of farming with *Tilapia*?
- A** income generation
  - B** stock exchange
  - C** source of omega oil
  - D** source of protein
- 14** Fish is a good source of protein.
- What is the main purpose of proteins in the human diet?
- A** for energy
  - B** for growth
  - C** for fibre
  - D** for healthy skin
- 15** Which is an example of a healthy snack sold at a school tuck shop?
- A** bananas
  - B** chocolate bars
  - C** fizzy drinks
  - D** fried fries
- 16** What is the function of vitamin C in humans?
- A** prevents anaemia
  - B** prevents goitre
  - C** prevents rickets
  - D** prevents scurvy

17 Which minerals can be obtained from food type **A** and food type **B**?



- A Calcium and Iodine
- B Calcium and Iron
- C Iodine and Iron
- D Sodium and Fluorine

18 Which nutrients contains nitrogen?

- A fats
- B proteins
- C starch
- C sugar

19 Alveoli have rounded walls in order to

- A decrease the surface area for gaseous exchange
- B decrease the volume for gaseous exchange
- C increase the surface area for gaseous exchange
- D increase the volume for gaseous exchange

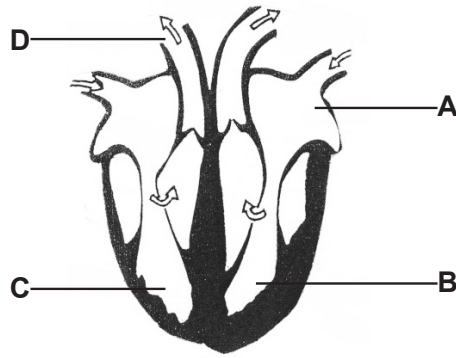
20 What is the effect of nicotine in cigarettes on the human body?

- A it decreases blood pressure
- B it decreases heart diseases
- C it paralyses cilia
- D it stops ventilation in the lungs

21 Which activity is likely to reduce the individual's risk of heart attack?

- A eating burgers
- B exercising
- C smoking
- D watching soccer

22 Which is the left ventricle of the human heart?



23 The diagrams show two blood cells, X and Y.



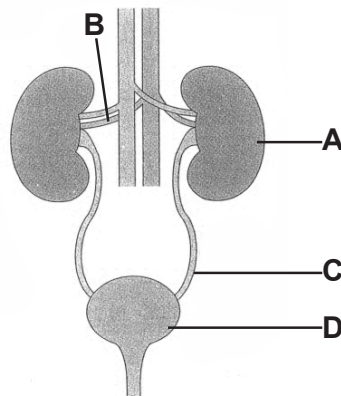
Which feature differentiates cell X from cell Y?

- A cell membrane
- B cell wall
- C cytoplasm
- D nucleus

24 What happens when there is too much water in the body?

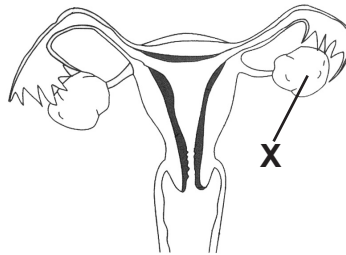
- A excess water leaves the body through urine
- B less water leaves the body through faeces
- C the body dehydrates
- D the person drinks too much water

25 The diagram shows the urinary system.



Which labelled structure carries urine to the bladder?

- 26 Which is a likely social impact of drug abuse?
- A abuse of family members
  - B decrease in crime and prostitution
  - C paying debt in good time
  - D students showing improved performances in studies
- 27 Which hormone is responsible for the breast development observed in adolescent females?
- A adrenaline
  - B antidiuretic
  - C oestrogen
  - D testosterone
- 28 Where does fertilisation takes place?
- A in the ovaries
  - B in the oviducts
  - C in the vagina
  - D in the womb
- 29 The diagram shows the reproductive system of a female.



Identify the structure labelled X.

- A cervix
  - B ovary
  - C uterus
  - D vagina
- 30 Which activity releases methane into the atmosphere?
- A burning fossil fuels
  - B fermentation of food in gut of ruminants
  - C using artificial fertilisers
  - D using refrigerators

## SECTION B

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

- 1 (a) (i) Use a ruled line to match the components in column **A** with their immune functions in column **B**.

<b>A</b>
stomach
skin
white blood cells

<b>B</b>
keeps out bacteria
kills pathogens inside the body
kills pathogens ingested with food

[3]

- (ii) The trachea also has an immune function.

State **two** adaptations in the trachea that enables it to perform this immune function.

1.....

2.....

[2]

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

.....

.....

[1]

- (b) (i) Malaria is an example of a infectious disease humans are vaccinated against.

Define *immunisation*.

.....

.....

[1]

- (ii) 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]**



2 (a) Fig. 2.1, is a photograph of an African rabbit.



Fig. 1

(a) Rabbits are mammals and have a scientific name *Capreolus marjorita*.

(i) State **two** visible diagnostic features in Fig.2.1 which identifies a rabbit as a mammal.

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

(ii) State the species of this mammal.

..... [1]

(iii) Describe how the species name of the rabbit can be distinguished from its genus name in the binomial system.

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

**(b)** Mammals are one of the five classes of chordates.

The list describes some features of groups of phylum Chordata.

Name the class of chordates which has the distinguishing feature of:

**(i)** dry scales .....

**(ii)** feathers.....

**(iii)** gills .....

**(iv)** smooth moist skin.....

**(v)** sweat glands..... [5]

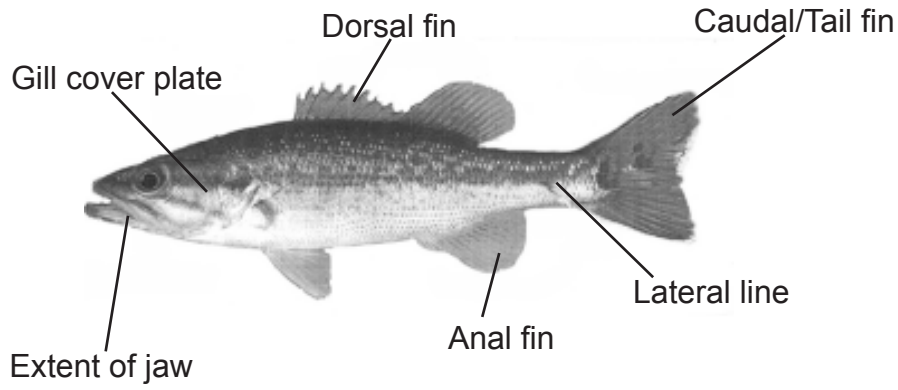
**(c)** Outline **two** principles used in classifying organisms.

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

[2]

**[12]**

- 3 Fig. 3.1 shows the external features of a fish.



**Fig. 3.1**

- (a) Make a large drawing of the fish showing the main external features.

[4]

- (b) **On your drawing** label **two** external features that show that the fish is adapted for movement in water.

[2]

- (c) Calculate the magnification of your drawing.

[2]

(d) Discuss **two** adaptations of tilapia to the Namibian environment.

1.....

.....

2.....

.....

[2]

(e) Give **two** reasons why fish is an important part of a balanced diet.

1.....

.....

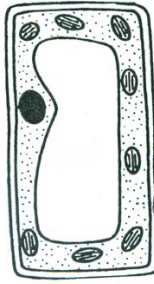
2.....

.....

[2]

[12]

4 Fig. 4.1 shows a cell.



**Fig. 4.1**

(a) State whether the cell in Fig. 4.1 is a prokaryotic or eukaryotic cell. Give a reason to support your answer.

.....

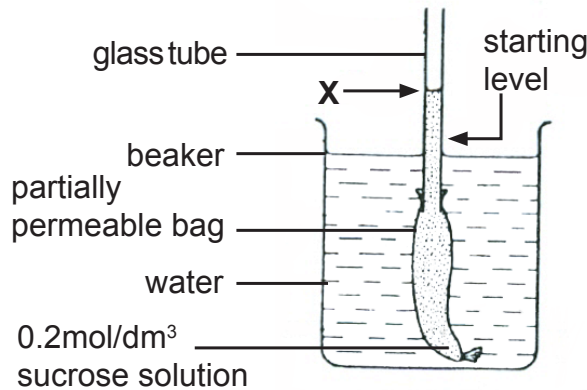
.....

.....

.....

[2]

(b) Fig. 4.2 shows the results of an experiment. The liquid in the tube raised to point X after three hours.



**Fig. 4.2**

(i) Name the process investigated in this experiment.

.....

[1]

(ii) The partially permeable membrane represent a specific part in a living eukaryotic cell. State the part it represents.

.....

[1]

(iii) Explain the significance of the properties of the part you mentioned in (b)(ii) for the experiment to be successful.

.....

.....

[1]

(c) Fig 4.3 shows plant and animal cells, **A - D** that are modified for specific functions.

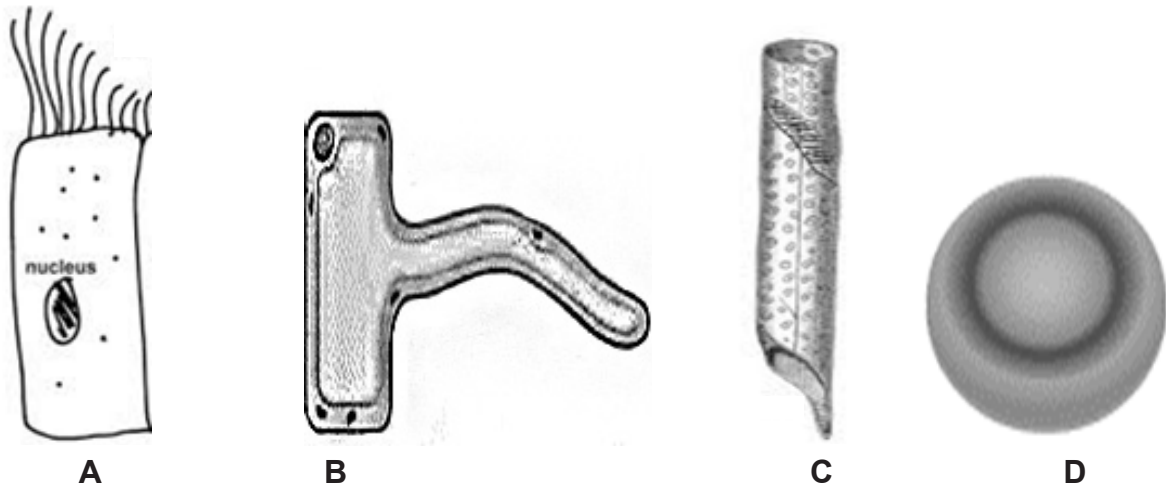


Fig. 4.3

(i) Identify cells **A**, **C** and **D**.

**A** .....

**C** .....

**D** .....

[3]

(ii) State the function of cell **B**.

.....

.....

[1]

(iii) Describe **two** structural adaptations of cell **D**.

.....

.....

.....

.....

[2]

[11]

5 (a) (i) Define a *balanced diet*.

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

[2]

(ii) Proteins are macro nutrients.

Give **one** other example of a macro nutrient and distinguish between macro and micro nutrients.

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

[3]

(b) Table 5.1 shows daily energy requirements for different categories of people.

**Table 5.1**

Categories	Energy requirements/kJ	
	Males	Females
Children aged 10	10 000	10 000
Adolescents	12 000	10 000
Mine worker	20 000	12 000
Office worker	12 000	10 000

(i) Refer to Table 5.1 to **describe** and **explain** how sex and different activities influence the amount of energy required by different people.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[4]

(ii) Name deficiency diseases caused by the lack of the following nutrients in the diet:

protein .....

vitamin C .....

[2]  
[11]



- 6 (a) The blood, as it circulates around the body, carries substances from one organ to another.

Complete Table 6.1 to show

- (i) the organ through which they enter the blood, and  
(ii) the organ through which they leave the blood.

**Table 6.1**

Substances	Organ (i)	Organ (ii)
oxygen	.....	all respiring organs
carbon dioxide	all respiring organs	.....
urea	.....	kidney
glucose	small intestine or liver	.....
insulin	.....	.....

[6]

- (b) State **two** features of the heart which enable it to keep the blood circulating.

1.....

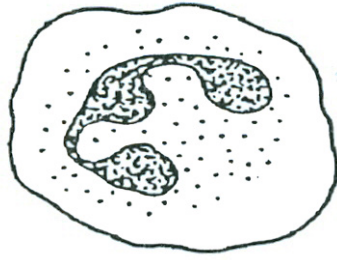
.....

2.....

.....

[2]

(c) Fig. 6.1 shows a blood cell.



**Fig. 6.1**

(i) Identify the type of blood cell.

..... [1]

(ii) State the function of this cell.

..... [1]

**[10]**

For  
Examiner's  
Use

7 (a) Define *excretion*.

.....

.....

.....

.....

[2]

(b) In Table 7.1, state **three** main ways in which a person loses water and for each, state why it is important.

**Table 7.1**

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

[6]

(c) The lungs also have an excretory function in the body of removing waste products from the body.

(i) In which part of the breathing system does the waste product collect before it is expelled from the body?

.....

[1]

(ii) Name the process through which this waste product gets from the blood into the part mentioned in (c)(i).

.....

[1]

**[10]**

8 Fig. 8.1 shows a reflex arc which is a component of the nervous system.

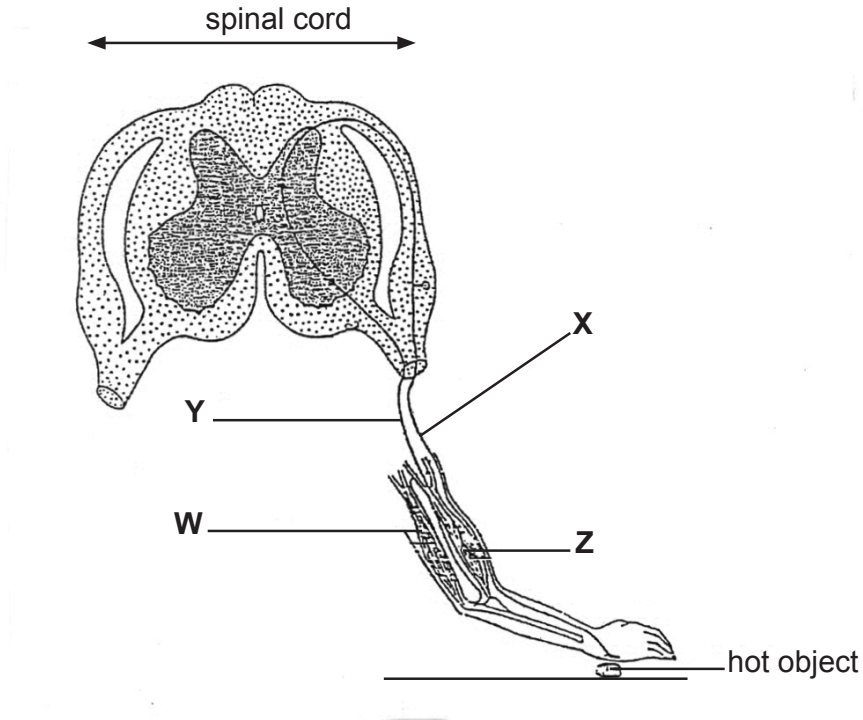


Fig. 8.1

(a) (i) Identify the structures labelled X and Y.

X .....

Y .....

[2]

(ii) State the sense organ that will detect the stimuli in Fig. 8.1.

.....

[1]

(iii) How will the arm respond to the stimulus of the hot object?

.....

[1]

(iv) Which of the muscles Z or W will contract to bring about the response mentioned in (a)(iii).

.....

[1]

(v) How might the response in a (a)(iii) be affected if the person is under the influence of alcohol?

.....

[1]

(vi) What is the role of the spinal cord in the action that result from touching the hot object?

..... [1]

(vii) Alcohol can cause harm to the body.

State **one** long - term effect that alcohol abuse might have on the nervous system.

..... [1]

**[8]**

9 Fig. 9.1 shows part of the female reproductive system with a fetus.

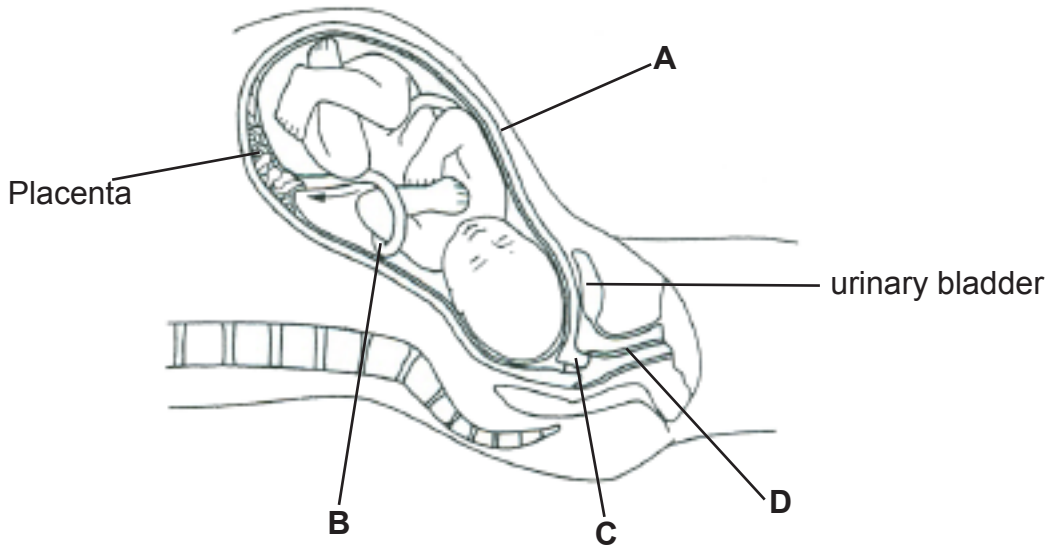


Fig. 9.1

(a) Name structure **A** to **D**.

**A** .....

**B** .....

**C** .....

**D** .....

[4]

(b) Describe **one** function of the placenta during pregnancy.

.....

.....

[1]

(c) (i) State **two** waste substances which are carried by the blood from the fetus to the mother.

1 .....

2 .....

[2]

(ii) Name the blood vessel in which these substances are carried.

.....

[1]

[8]

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

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

[2]

**(b)** Explain how the burning of fossil fuels can cause global warming.

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

[2]

**(c)** List **two** effect of global warming.

.....  
.....

[2]

**(d)** Name a greenhouse gas which also damages the ozone layer.

.....

[1]

**(e)** State the importance of the ozone layer.

.....  
.....

[1]

**[8]**