17231904

EXAMINATIONS COUNCIL OF ZAMBIA

JUNIOR SECONDARY SCHOOL LEAVING EXAMINATION (GRADE 9) – 2022

Integrated Science 502/1

Paper 1

(INTERNAL CANDIDATES)

502-1

Time: 2 hours 30 minutes **Marks: 80**

Instructions to Candidates

1 Pull out the inserted **Answer Booklet** from the question paper.

2 Write your **examination number, school/centre name** and **code** on the **Answer Sheet**.

3 Ensure that you **write** your **examination number** on **every page** of the Answer Booklet.

4 This paper consists of two Sections **A** and **B**. Answer **all** the questions in both sections of this paper.

5 Section **A:** for each question, **four** suggested answers **A**, **B**, **C** and **D** are given. Choose the best one and mark it on the answer grid provided in the Answer Booklet.

6 Section **B:** write all the answers in the spaces provided for Section **B** in the Answer Booklet.

7 Hand in the Answer Booklet and the rest of the question paper separately.

Information for Candidates

1 Cell phones are **not allowed** in the examination room.

2 Calculators are **not allowed** in the examination room.

This question paper consists of 13 printed pages.

SECTION A: [20 MARKS]

Answer **all** questions. Mark your answers with a **cross (X)** on the Answer Grid provided in the Answer Booklet.

1 Which reproductive organs in human beings produce hormones that start the action changes during puberty in boys and girls?

	Boys	**Girls**
A	Testes	Ovaries
B	Testes	Oviduct
C	Urethra	Cervix
D	Urethra	Oviduct

2 The following are the organs in the female reproductive system of the human being.

1. Uterus
2. Cervix
3. Oviduct
4. Vagina

Which order shows the correct sequence of the movement of the semen after ejaculation to reach the site of fertilisation?

A $1 \rightarrow 2 \rightarrow 4 \rightarrow 3$
B $2 \rightarrow 3 \rightarrow 4 \rightarrow 1$
C $3 \rightarrow 4 \rightarrow 2 \rightarrow 1$
D $4 \rightarrow 2 \rightarrow 1 \rightarrow 3$

3 Which of the following diseases is **not** caused by nutritional deficiency?

A Anaemia
B Kwashiorkor
C Malaria
D Marasmus

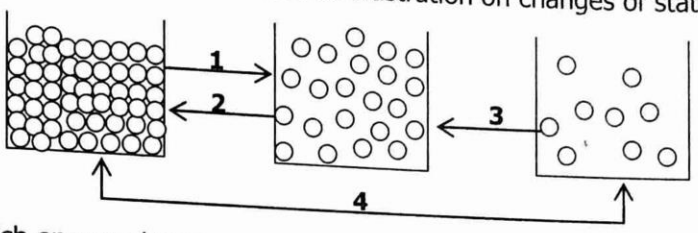
4 The main type of pollution caused by uncontrolled disposal of garbage in towns is called ...

A air pollution.
B land pollution.
C soil neutralisation.
D water pollution.

5 The term "phototropism" refers to the action made by a growth of a plant in response to ...

A gravity.
B heat.
C light.
D water.

6 The following diagrams show an illustration on changes of state in matter.



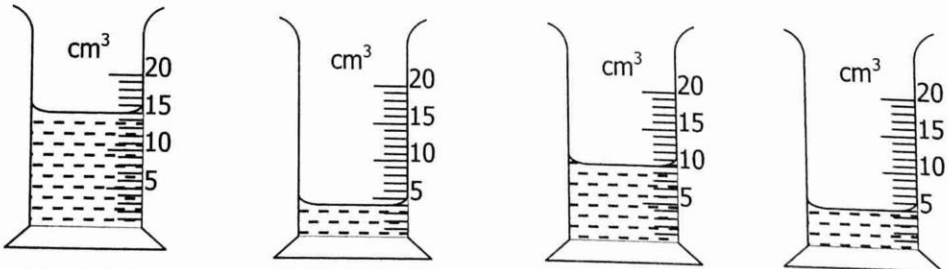
Which energy changes correctly occur at **1**, **2**, **3**, and **4**?

	1	**2**	**3**	**4**
A	Condensation	sublimation	freezing	evaporation
B	Evaporation	freezing	melting	sublimation
C	Melting	freezing	condensation	sublimation
D	Sublimation	condensation	evaporation	melting

7 Calculate the weight of a 40kg object on earth given that acceleration due to gravity is 10N/kg. The weight is ...

A 4N.
B 30N.
C 50N.
D 400N.

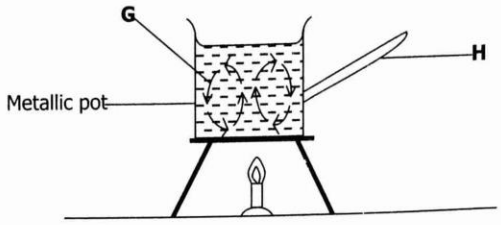
8 The following diagrams show four different liquids each of mass 10g but having different volumes.



Which of the liquids has the highest density?

A Liquid 1
B Liquid 2
C Liquid 3
D Liquid 4

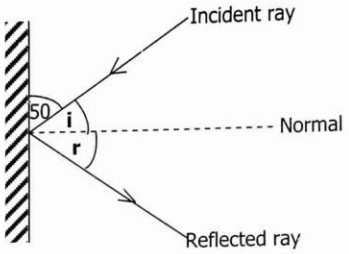
9 The diagram shows an experiment on heat movement.



What type of heat movement occurs at point **G** and **H**?

	G	H
A	Conduction	Radiation
B	Convection	Conduction
C	Convection	Radiation
D	Radiation	Convection

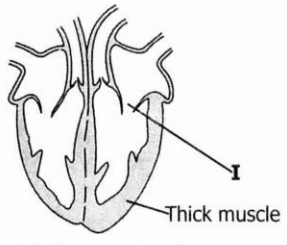
10 The diagram is on an experiment with light rays.



What is the value of angle **r**?

A 25°
B 40°
C 50°
D 90°

11 The diagram shows a section of the human heart.



Identify the part labelled **I** in the diagram.

A Bicuspid valve.
B Semilunar valve of the pulmonary artery.
C Semilunar valve of the aorta.
D Tricuspid valve.

12 Which human activity presents a very high risk of spreading Human Immunodeficiency Virus (HIV) and Acquired Immuno Deficiency Syndrome (AIDS)?

A Blood transfusion
B Circumcision
C Engaging in unprotected sex
D Sharing sharp objects

13 Which of the following are used to treat water at a water purification plant?

A Chlorine and desalination
B Chlorine and sand
C Desalination and precipitation
D Precipitation and sand

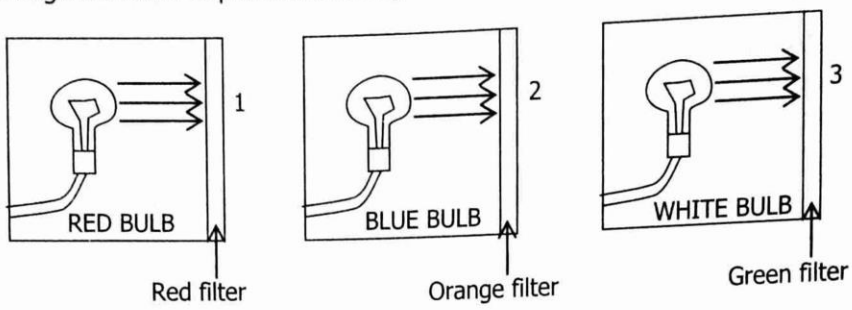
14 Which statement is correct about the importance of photosynthesis to the atmosphere? It helps to ...

A add nitrogen.
B balance carbon dioxide.
C remove nitrogen.
D remove water vapour.

15 What will be the products of a chemical reaction between sodium chloride and silver nitrate?

A Silver chloride and nitrogen
B Silver chloride and sodium chloride
C Sodium nitrate and chlorine
D Sodium nitrate and silver chloride

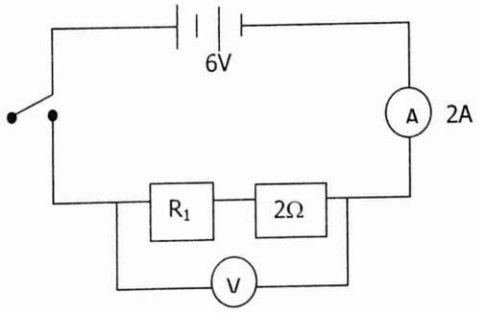
16 The diagrams show experiments on light filters using ray boxes.



What colour would be observed at positions **1**, **2** and **3**?

	1	**2**	**3**
A	Black	Black	Orange
B	Black	Orange	White
C	Red	Black	Green
D	Red	Blue	Green

17 The diagram shows an electric circuit.



Calculate the value of R_1 if the other resistor is 2Ω. The value of R_1 is ...

A 1.0Ω.
B 2.0Ω.
C 3.0Ω.
D 4.0Ω.

18 What form of energy does water stored at a Hydro Electric Power Station possess?

A Chemical
B Electric
C Kinetic
D Potential

19 Which of the following is correct about analogue transmission?

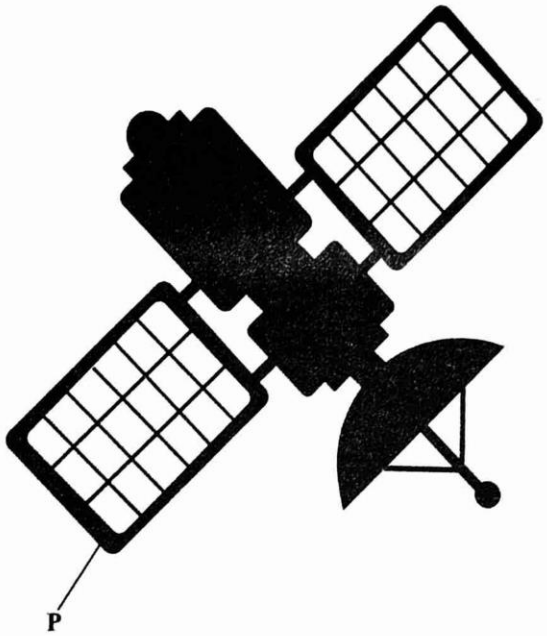
A Its signals carry a lot of information per second.

B Its information can be stored and processed by computers.

C The quality of signals over a long distance is maintained.

D The transmission is affected by extra random interfering signals.

20 The diagram shows a geostationary satellite.



Identify the structure **P** and its functions.

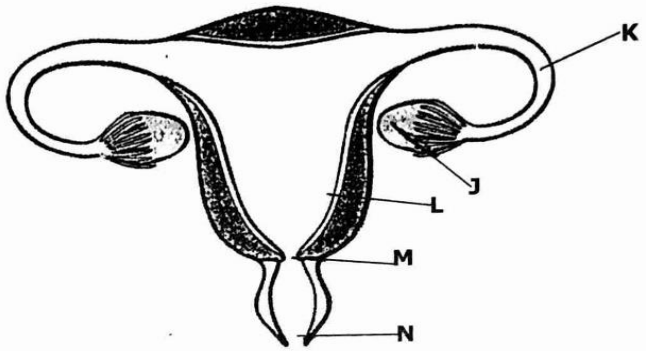
	Structure P	**Function of P**
A	Antenna	Receives and transmits signals.
B	Micro link	Links with earth satellite.
C	Solar panel	Provides energy to the satellite.
D	Wings	Moves satellite in the atmosphere.

SECTION B: [60 MARKS]

Write all the answers in the spaces provided in the Answer Booklet.

1 THE HUMAN BODY

The following diagram shows the female reproductive system.



(a) Identify organs **L** and **M**. [2]

(b) Explain the functions of organ **J** and **K**. [2]

(c) Which organ produces chemicals associated with changes at puberty? [1]

(d) Explain the importance of observing hygiene of the part **N**. [1]

[Total: 6 marks]

2 THE ENVIRONMENT

(a) Identify **one** cause of each of the following:

(i) air pollution [1]

(ii) water pollution [1]

(iii) land pollution [1]

(b) Give **one** effect on the environment and living things caused by

(i) air pollution; [1]

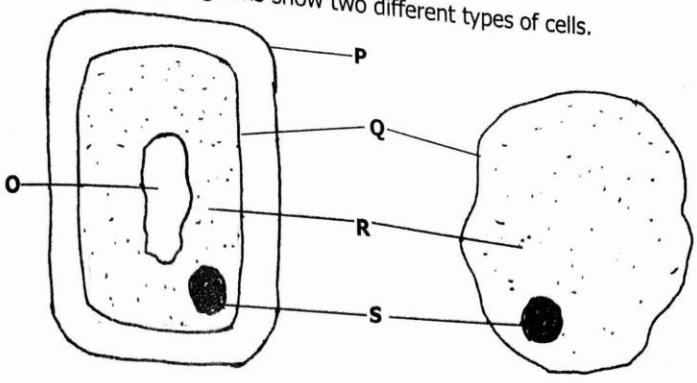
(ii) land pollution. [1]

(c) Describe **one** way of reducing air pollution. [1]

[Total: 6 marks]

3 PLANTS AND ANIMALS

The following diagrams show two different types of cells.



Cell **T** Cell **U**

(a) Which of the two cells **T** or **U** is a plant cell? [1]

(b) Identify the part labelled **Q**. [1]

(c) State the functions of the structures **P** and **R**. [2]

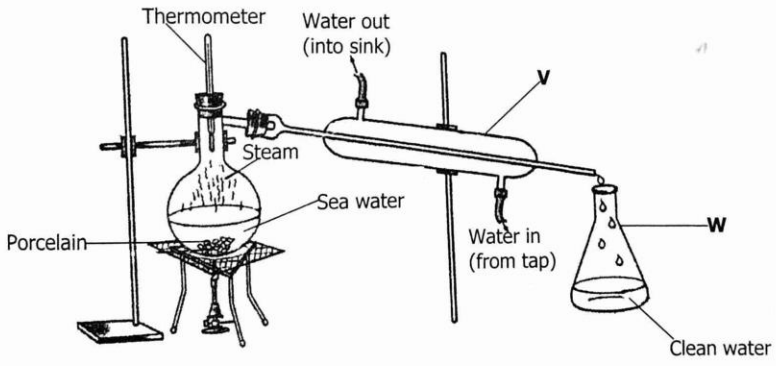
(d) Which structure was omitted in cell **T**? [1]

(e) Explain **one** structural difference between cell **T** and **U**. [1]

[Total: 6 marks]

4 MATERIALS AND ENERGY

The following diagram shows apparatus used to obtain clean water from sea water.



(a) **(i)** Identify the apparatus labelled **W**. [1]

(ii) What is the function of apparatus **V**? [1]

(b) Mention the method of separating mixtures illustrated in the diagram. [1]

(c) What term is used to describe the substance that will remain in the round bottomed flask when separation comes to an end? [1]

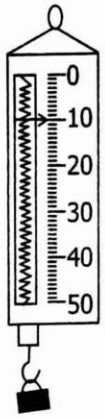
(d) State **one** industrial application of the method of separating mixtures shown in the diagram. [1]

(e) What method of separating mixtures can be used to separate water and ethanol? [1]

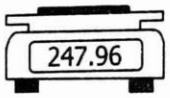
[Total: 6 marks]

5 MATERIALS AND ENERGY

The following diagrams show two instruments used when measuring mass and weight.



Instrument X



Instrument Y

(a) Define the following:

(i) mass; [1]

(ii) weight. [1]

(b) Which instrument **X** or **Y** measures

(i) mass; [1]

(ii) weight? [1]

(c) What happens to the mass and the weight of an object when moved from place to place? [2]

[Total: 6 marks]

6 THE HUMAN BODY

The following diagram shows the shape of the chest during inspiration and expiration.

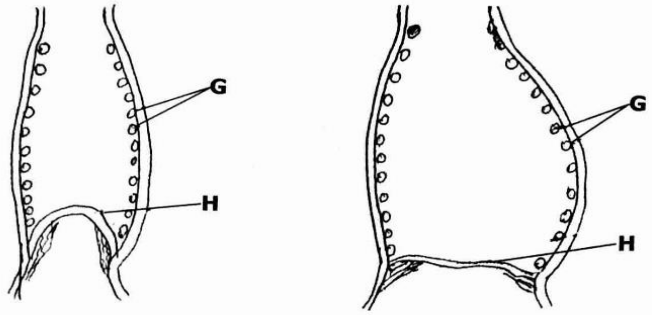


Diagram A **Diagram B**

(a) Which diagram shows that inspiration has taken place? [1]

(b) Identify the parts labelled

(i) G;

(ii) H. [2]

(c) Explain what causes the change in shape of **H** from diagram **A** to **B**. [1]

(d) Name the muscles found between the structure labelled **G**. [1]

(e) How does the named structure in **(d)** help in the breathing mechanism in diagram **B**? [1]

[Total: 6 marks]

7 HEALTH

(a) Apart from HIV and AIDS, mention **two** common sexually transmitted infection. [2]

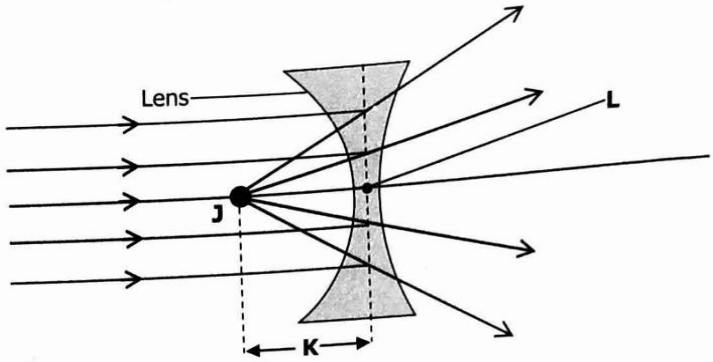
(b) Explain **two** ways in which HIV and AIDS has negatively impacted on the population of a country. [2]

(c) Describe **two** ways by which HIV and AIDS can be prevented. [2]

[Total: 6 marks]

8 MATERIALS AND ENERGY

The diagram is on an experiment with light using a lens.



(a) What type of lens is used in this experiment? [1]

(b) Identify the positions labelled by the letters **J** and **K**. [2]

(c) What type of image does this type of lens produce? [1]

(d) Which letter shows the optical centre? [1]

(e) Mention **one** use of the type of lens used in this experiment. [1]

[Total: 6 marks]

9 MATERIALS AND ENERGY

The following diagrams show a block with a force of 100N resting on the floor from two different positions.

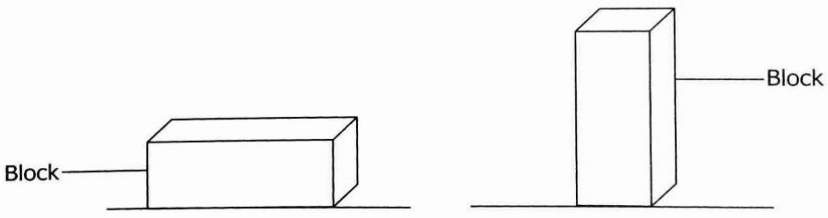


Diagram 1 **Diagram 2**

(a) If the side of the block which is in contact with the floor in diagram **1**, is $2m^2$, calculate the pressure exerted on the floor. [2]

(b) **(i)** State whether the pressure exerted on the floor will increase, reduce or remain the same when the block is turned as shown in **diagram 2**. [1]

(ii) Give a reason for your answer. [1]

(c) State **two** factors which affect pressure in gases. [2]

[Total: 6 marks]

10 MATERIALS AND ENERGY

(a) Define energy. [1]

(b) State **one** form of energy. [1]

(c) Explain **one** negative effect of energy generation on the environment. [1]

(d) Describe **two** ways by which energy can be conserved. [2]

(e) Describe how **one** form of energy can be changed into another. [1]

[Total: 6 marks]