



EXAMINATIONS COUNCIL OF ZAMBIA

JUNIOR SECONDARY SCHOOL LEAVING EXAMINATION (GRADE 9) – 2020

Integrated Science 502/1

Paper 1

Specimen

(INTERNAL & EXTERNAL CANDIDATES)

Time: 2 hours 30 minutes

Marks: 80

Instructions to candidates

- 1 Separate the **Answer Booklet** from the question paper.
- 2 Write your **name, examination number** and **school/centre name** and **code** on the **Answer Booklet**.
- 3 This paper consists of two Sections **A** and **B**.
- 4 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 show it on the answer grid in the Booklet by marking it with a cross (x).

Example, if the answer is C it will be marked as shown:

A	B	C	D
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- 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

Cell phones are not allowed in the examination room.

Calculators are not allowed in the examination room.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

SECTION A

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

1 Which **one** of the following changes is only associated with puberty in females?

- A Breasts grow
- B Voice becomes deeper
- C Hair grows in the armpits
- D Start having wet dreams

2 The following are the organs in the male reproductive system of human beings;

- 1 Penis
- 2 Urethra
- 3 Epididymis
- 4 Testes

In which order is the correct sequence of the movement of the semen during ejaculation?

- A 1 → 2 → 3 → 4
- B 3 → 4 → 2 → 1
- C 4 → 3 → 2 → 1
- D 2 → 1 → 4 → 3

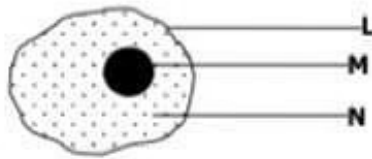
3 Rickets is a nutritional deficiency disease caused by lack of...in a diet of a growing child.

- A carbohydrates
- B proteins
- C vitamin A
- D vitamin D

4 Which of the following is **not** an example of ways of preventing pollution of the environment?

- A Reducing the use of plastic bottles used in soft drinks industry.
- B Re-using the plastic bags for groceries at the super market.
- C Recycling the plastic bags used for soft drinks.
- D Burying the plastic bottles used for soft drinks.

- 5 The diagram below shows an animal cell.

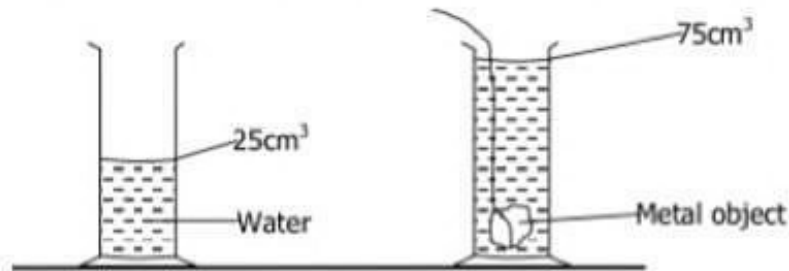


Identify the part labelled **N**.

- A Cell wall
 - B Chloroplast
 - C Cytoplasm
 - D Nucleus
- 6 The term "Geotropism" refers to the movement of a part of a plant in response to...
- A chemicals.
 - B gravity.
 - C light.
 - D water.
- 7 Which one of the following is the correct symbol for Iron atom?
- A H
 - B I
 - C Fe
 - D Al
- 8 A stone of mass 10kg on earth (gravity 10m/s^2) is taken to the moon for an experiment on weight. What will be its mass and weight on the moon if the acceleration due to gravity at the moon is 1.6m/s^2 ?

	Mass (Kg)	Weight (N)
A	10	16
B	10	160
C	5	16
D	5	160

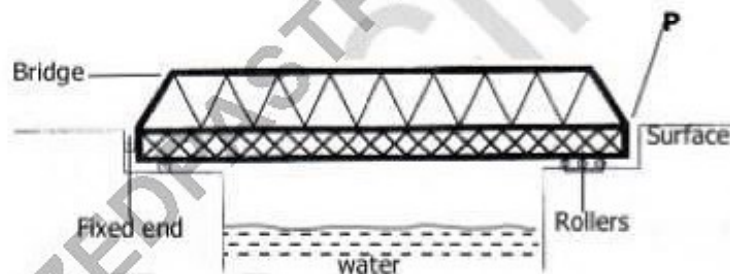
- 9 A metal object of mass 100g was placed in water as shown in the diagram below.



Calculate the volume and density of the metal object used in the experiment.
The correct volume and density of the metal object is...

	Volume (cm ³)	Density (g/cm ³)
A	25	4
B	50	2
C	75	1.3
D	25	2

- 10 Study the diagram showing a metallic bridge constructed over a river.



One end of the bridge was fixed while the other end was not fixed to the surface, at the point marked "P". This is to allow...

- A** water to pass when the river floods.
B the bridge to contract during cold season.
C the bridge to expand due to heat.
D the rollers to move freely during contraction.
- 11 Which of the following is the correct function of blood plasma? It...
- A** transports water, body waste and food nutrients.
B prevents back flow of blood in the blood vessels.
C adds oxygen to the blood and removes carbon dioxide.
D fights germs in the blood to prevent diseases.

12 The list below shows organs found in the human respiratory system.

- 1 Trachea
- 2 Bronchus
- 3 Bronchioles
- 4 Nostrils

Which of the following sequences is the correct order of passage of air during inhalation?

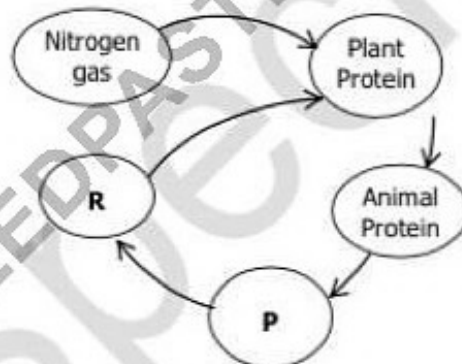
- A** 1 → 3 → 2 → 4
B 4 → 2 → 3 → 1
C 2 → 4 → 3 → 1
D 4 → 1 → 2 → 3

13 To reduce the spread of HIV and AIDS, one needs Voluntary Counselling and Treatment (VCT). Which one of the following is **not** the importance of VCT?

To ...

- A** know one's status.
B avoid re-infections.
C prevent an intended pregnancy.
D live positively with one's status.

14 Study the diagram representing the Nitrogen cycle.



Which chemical compound is found at position marked **P** and **R** in the diagram?

- | P | R |
|-------------------|----------|
| A Ammonia | Nitrates |
| B Nitrates | Ammonia |
| C Nitrates | Nitrites |
| D Ammonia | Nitrites |

15 Which of the following is a correct example of cross-breeding?

- A** Self-pollination.
B Breeding within the same family.
C Selective breeding between similar species.
D Selective breeding across completely different species.

16 Which of the following equations best describes the process of photosynthesis?

- A Oxygen + Hydrogen \longrightarrow Water
- B Carbon + Oxygen $\xrightarrow{\text{heat}}$ Carbon dioxide
- C Glucose + Oxygen \longrightarrow Water + Carbon dioxide + energy
- D Water + Carbon dioxide $\xrightarrow[\text{Chlorophyll}]{\text{light}}$ Glucose + Oxygen

17 Study the following chemical reaction between sodium chloride and silver nitrate.



What name is given to such a chemical reaction?

- A Decomposition
- B Double replacement
- C Single replacement
- D Synthesis

18 The diagram below shows a type of lens.



Identify the type of lens and explain its use in daily life.

Lens Type	Use
A Convex lens	Camera
B Convex lens	Telescope
C Concave lens	Camera
D Concave lens	Telescope

19 Which of the following best explains what energy is? Energy is the...

- A ability to do work.
- B force used per unit area.
- C ability to provide power.
- D potential difference between two points in a circuit.

20 Calculate the pressure exerted on the ground by a metal object on an area of 0.50m^2 if its weight is 200N . The pressure will be...

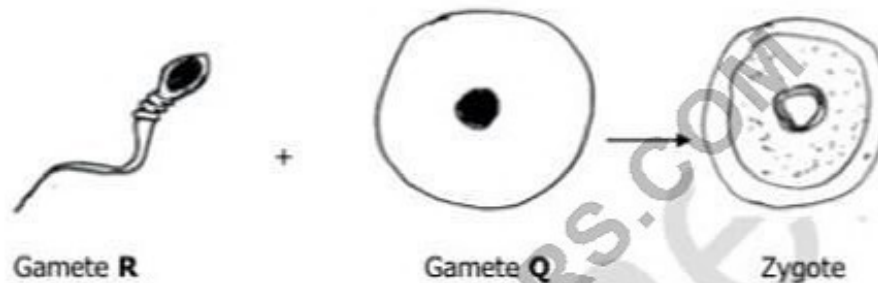
- A 4000Nm^2
- B 400Nm^2
- C 0.0025Nm^2
- D 0.00025Nm^2

SECTION B

Write all the answers in the spaces provided for section B in the Answer Booklet

1 THE HUMAN BODY

Study the diagram illustrating a process in sexual reproduction involving gametes (sex cells) **R** and **Q**.

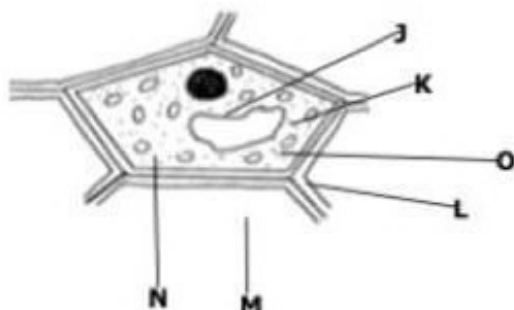


- (a) Identify gamete **R**. [1]
- (b) Name the organ that produces gamete **Q**. [1]
- (c) What process occurs between gamete **R** and **Q** that results into the zygote? [1]
- (d) State the organ in which the zygote is produced. [1]
- (e) (i) What term is given to the period from the time the zygote is produced to the time of birth? [1]
- (ii) How long is this period of development from zygote to child birth in human beings? [1]

Total = 6 marks

2 PLANTS AND ANIMALS

Study the diagram of a cell as seen under a light microscope.



- (a) Identify the type of cell shown in the diagram. [1]
- (b) Which labelled features on the cell in the diagram enabled you to identify the cell in (a) above? [1]
- (c) State **two** features of the cell labelled in the diagram that are found in both animal and plant cells. [2]
- (d) Which **two** letters represent the substances which make up the protoplasm? [2]

Total = 6 marks

3 HEALTH

The following are examples of nutritional deficiency diseases.

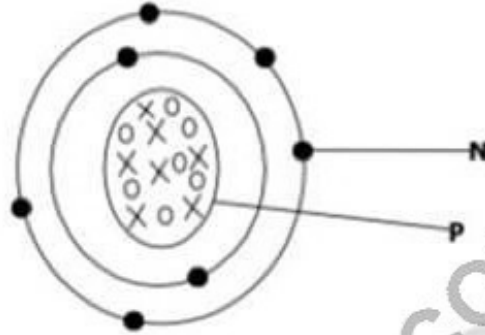
- 1 Marasmus
- 2 Kwashiorkor
- 3 Scurvy

- (a) What shortage of nutrients results into
- (i) marasmus,
 - (ii) kwashiorkor? [2]
- (b) State the symptoms of a person suffering from [2]
- (i) scurvy,
 - (ii) marasmus.
- (c) What vitamin is needed in a diet to avoid scurvy? [1]
- (d) Explain the importance of children's clinic in relation to preventing nutritional deficiency diseases. [1]

Total = 6 marks

4 MATERIALS AND ENERGY

The diagram below illustrates a model of a tiny particle that form matter.

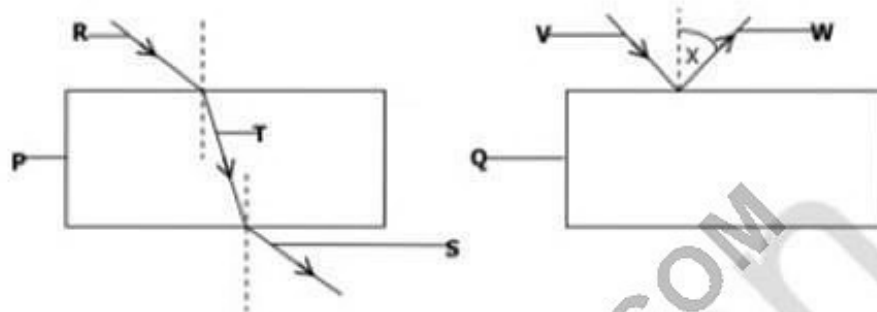


- (a) What do you call the tiny particles that make up matter? [1]
- (b) From the diagram, identify the
 (i) electron, [1]
 (ii) nucleus. [2]
- (c) What is a molecule? [1]
- (d) What substance is formed when hydrogen and oxygen are chemically combined? [1]
- (e) Give **one** example of a molecule with the same type of atoms. [1]

Total = 6 marks

5 MATERIALS AND ENERGY

Study the diagrams on an experiment of light with objects, **P** and **Q**

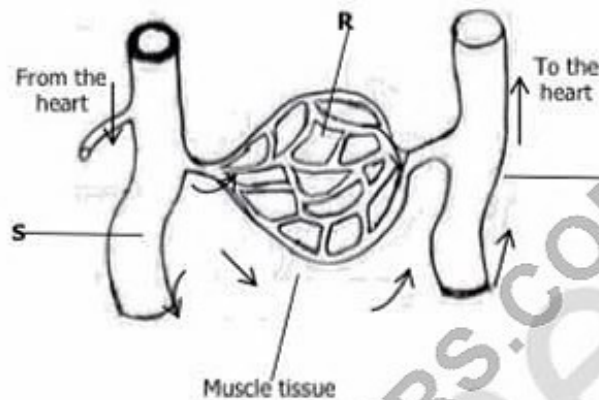


- (a) Which of the two objects **P** or **Q**
- (i) is transparent?
 - (ii) has a shiny opaque surface? [2]
- (b) Give the reason that helped you identify the transparent object in (a) above [1]
- (c) What name is given to the
- (i) ray labelled **T**,
 - (ii) angle labelled **X**. [2]
- (d) Why does the ray **R** bend as it enters object **P**? [1]

Total = 6 marks

6 THE HUMAN BODY

The diagram shows blood flow in blood vessels labelled **R**, **S** and **T** in a human body, to and from muscles.



- (a) Identify blood vessels
- (i) **S**, [1]
- (ii) **R**. [1]
- (b) From the diagram, give **one** reason for identifying blood vessel **S** in (a) (i) above. [1]
- (c) Which blood vessel, **R**, **S** or **T** will have a lot of carbon dioxide? [1]
- (d) Suggest **two** substances which can be exchanged between blood vessels **R** and muscle tissue. [2]

Total = 6 marks

7 THE ENVIRONMENT

- (a) Apart from the nitrogen cycle, name **two** cycles in the biosphere. [2]
- (b) What is the importance of the knowledge of cycles in the biosphere? [1]
- (c) Give **one** importance of water management. [1]
- (d) Suggest **two** ways of effective water management. [2]

Total = 6 marks

8 PLANTS AND ANIMALS

The table below shows some examples of animals and plants.

Animals	Plants
1 Cattle	1 Mango
2 Rhino	2 Orange
3 Chicken	3 Mukwa
4 Elephant	4 Sausage
5 Lion	5 Mukula

- (a) From the table, select
- (i) one animal domesticated by man, [1]
 - (ii) one plant domesticated by man. [1]
- (b) Which animal and plant are in danger of extinction? [2]
- (c) For the animal and plant identified in (b) above, explain why each is in danger of extinction [2]

Total = 6 marks

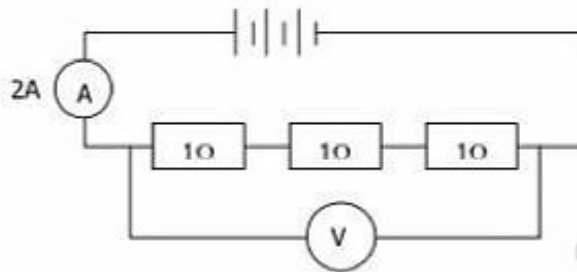
9 MATERIALS AND ENERGY

- (a) What is a chemical reaction? [1]
- (b) The following word equation demonstrates a type of a chemical reaction.
Copper + Oxygen \longrightarrow Copper Oxide
What is such a type of reaction called? [1]
- (c) What type of reaction is the electrolysis of acidified water? [1]
- (d) Explain the following nature of a chemical reaction.
- (i) Endothermic [1]
 - (ii) Exothermic [1]
- (e) Explain the Law of Conservation of matter in chemical reactions. [1]

Total = 6 marks

10 MATERIALS AND ENERGY

Study the electric circuit diagram below showing resistors connected to cells each having equal voltage.



- (a) How are the resistors in the circuit connected? [1]
- (b) Calculate the total resistance offered by the resistors. [1]
- (c) Calculate the voltage across the three resistors in the circuit. [2]
- (d) What is the voltage of each of the cells in the circuit? [1]
- (e) What would be the value of the total voltage across the resistors if the current was 4A? [1]

Total = 6 marks