00409006

EXAMINATIONS COUNCIL OF ZAMBIA

JUNIOR SECONDARY SCHOOL LEAVING EXAMINATION (GRADE 9) – 2016

Integrated Science 502/2

Paper 2

(INTERNAL AND EXTERNAL CANDIDATES)

Time: 2 hours **Marks: 60**

An extra 10 minutes will be given to you so that you complete your particulars on the Answer Booklet before you start writing.

Instructions to candidates

1 Pull out the **Answer Booklet** from the middle of the question paper.

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

3 Write your answers in the spaces provided in the **Answer Booklet**.

4 Answer **ALL** the questions.

Information to candidates

Cell phones are not allowed in the examination room.

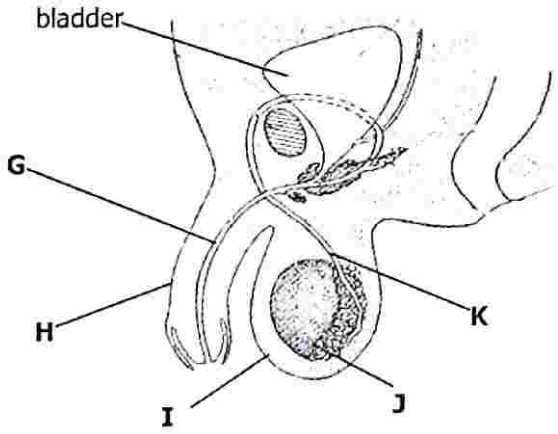
Calculators are not allowed in the examination room.

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

This question paper consists of 11 printed pages.

1 THE HUMAN REPRODUCTIVE SYSTEM AND PUBERTY

The diagram below shows the side view of the male reproductive organs.



(a) Identify the parts marked **G** and **I**. [2]

(b) State the function of part **J**. [1]

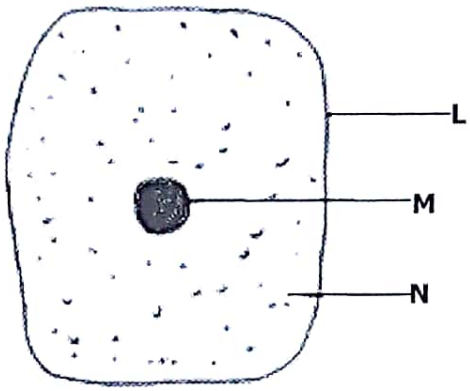
(c) Explain what would happen if part K was to be tied. [1]

(d) State two signs of puberty in boys. [2]

Total = 6 marks

2 ANIMAL CELL

The diagram below shows an animal cell.



Animal Cell

(a) Which letters on the diagram represents the nucleus and cytoplasm? [2]

(b) State the name of the part of an animal cell which selects what goes in and out of the cell. [1]

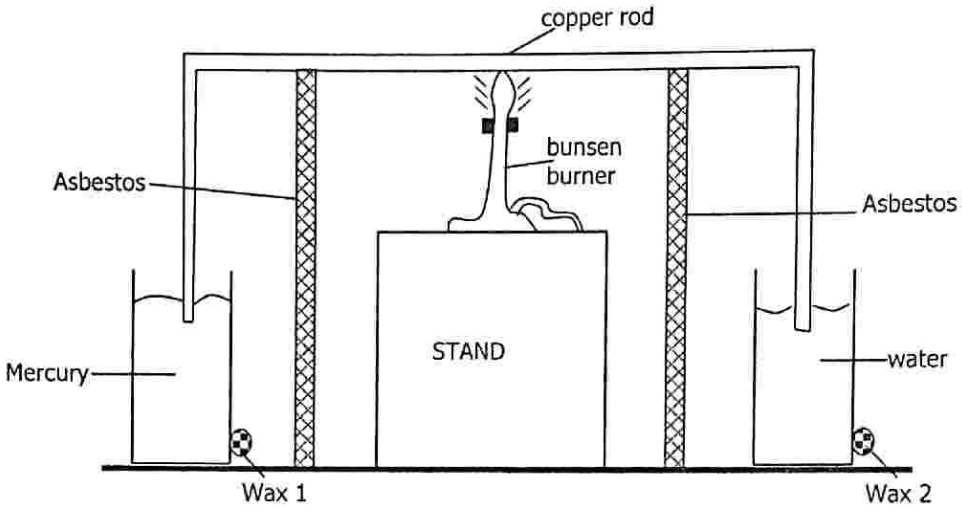
(c) What **two** parts of a plant cell are **not** found in animal cells? [2]

(d) What instrument is used to observe the structure of a cell? [1]

Total = 6 marks

3 HEAT TRANSFER

The diagram below shows a copper rod dipped into a beaker containing mercury on one side and into a beaker containing water on the other side. The rod was then heated in the middle using a Bunsen burner.



(a) **(i)** State the term given to the movement of heat in the copper rod. [1]

(ii) Explain why asbestos boards were placed in the positions shown. [1]

(b) **(i)** Which wax would melt first? [1]

(ii) Give a reason for your answer in question **(b) (i)** above. [1]

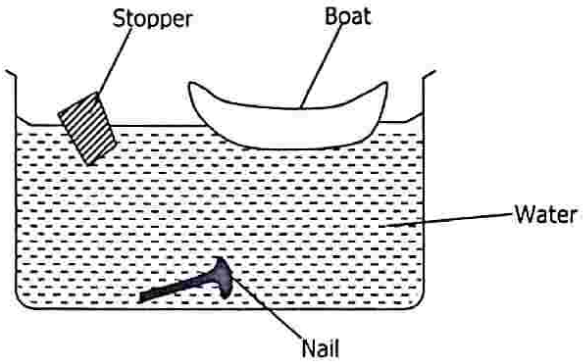
(iii) Explain why the wax on the other beaker did not melt at the same time as the one mentioned in **(b) (i)** above. [1]

(c) Suggest a method of heat transfer not demonstrated in the experiment above. [1]

Total = 6 marks

4 DENSITY

A toy boat of mass 500g made of metal, a stopper of mass 80g made of wood and an iron nail of mass 50g were put into a container filled with water as shown below.



(a) Define density. [1]

(b) Calculate the density of the stopper if its volume was found to be $100cm^3$. (Show your working) [2]

(c) What term is given to objects which stay on top of water as shown by the stopper and boat? [1]

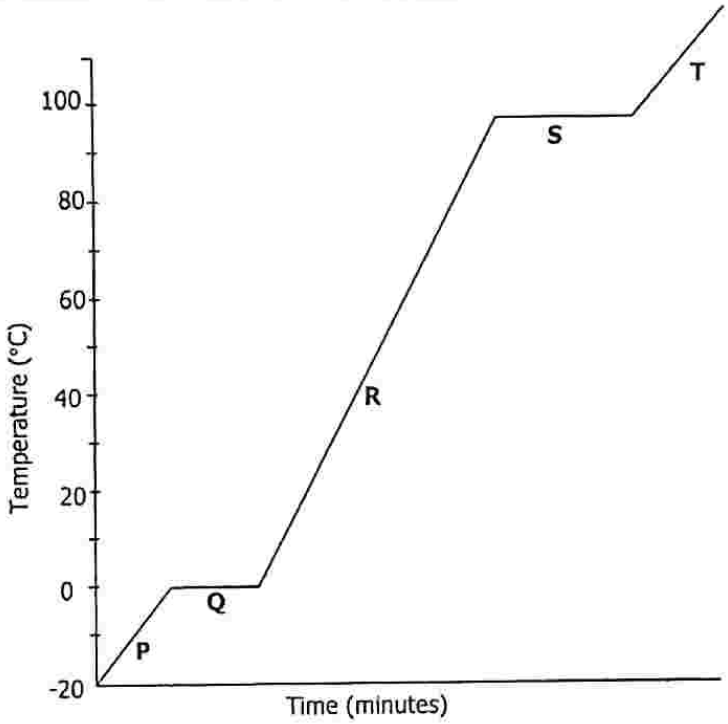
(d) Explain why the boat stayed on top of the water but the nail went down to the bottom of the water. [1]

(e) Predict what would happen to the boat if it was filled with water. [1]

Total = 6 marks

5 CHANGES OF STATE

The graph below shows changes in temperature a solid substance X underwent when it was heated.



(a) Which letters on the graph represents; the

(i) melting point

(ii) boiling point [2]

(b) Give a reason for your answer in **(a)** above. [1]

(c) Identify the stage in which the substance **X** would be in liquid state only. [1]

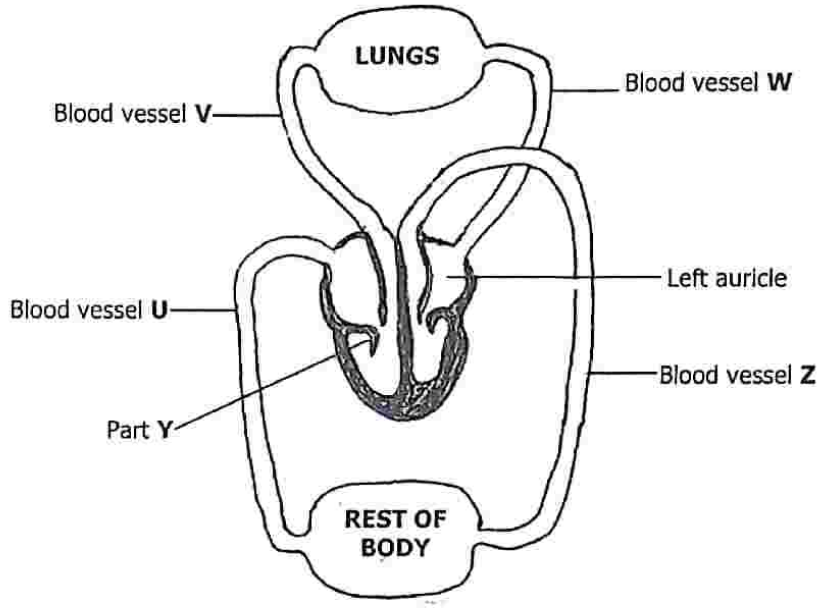
(d) At which stage would substance **X** exist in two different states of solid and liquid at the same time? [1]

(e) What is the term given to changes of state of substance **X** from **T** to **R**? [1]

Total = 6 marks

6 THE CIRCULATORY SYSTEM

The diagram below shows parts of a blood circulatory system in a human being.



(a) Identify the part labelled **Y**. [1]

(b) Name one blood vessel which is ...

(i) an artery

(ii) a vein. [2]

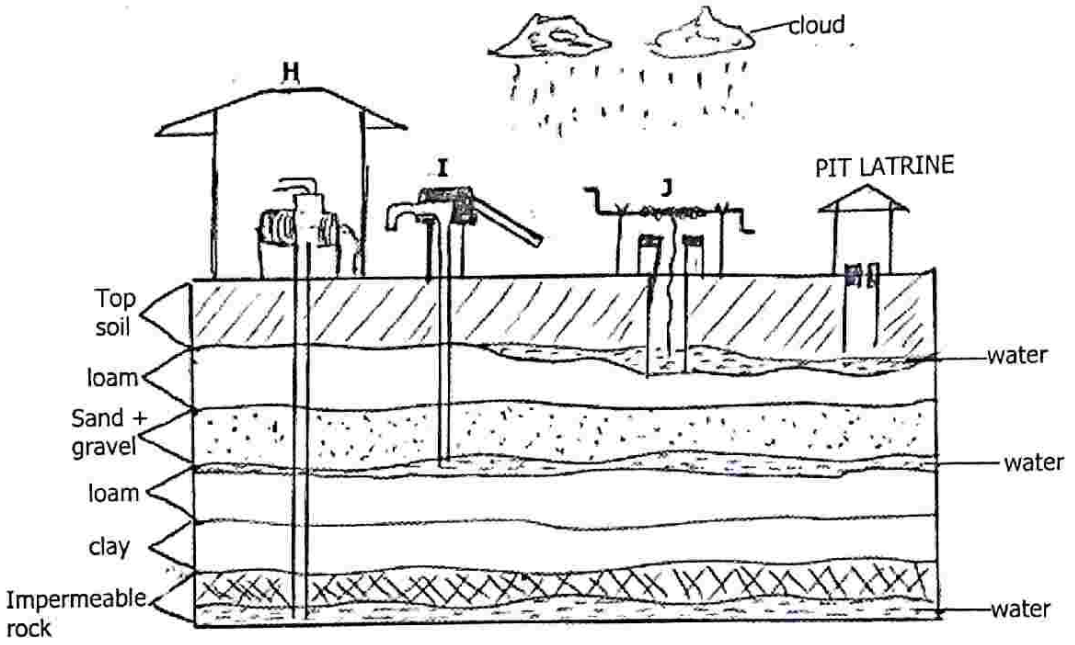
(c) Suggest the part where oxygen from the air enters the blood. [1]

(d) Using the labels on the diagram, describe how blood which is in the left auricle will move in the circulatory system and arrive back in the left auricle. [2]

Total = 6 marks

7 WATER MANAGEMENT

The diagram below shows some water sources labelled H, I and J.



(a) Which water source is the safest for drinking by humans? [1]

(b) State **one** disadvantage of obtaining drinking water from water source **J**. [1]

(c) State **one** way water is prevented from finishing in the water sources shown in the diagram above. [1]

(d) Explain the role played by sand and gravel in the quality of water from the bore holes. [1]

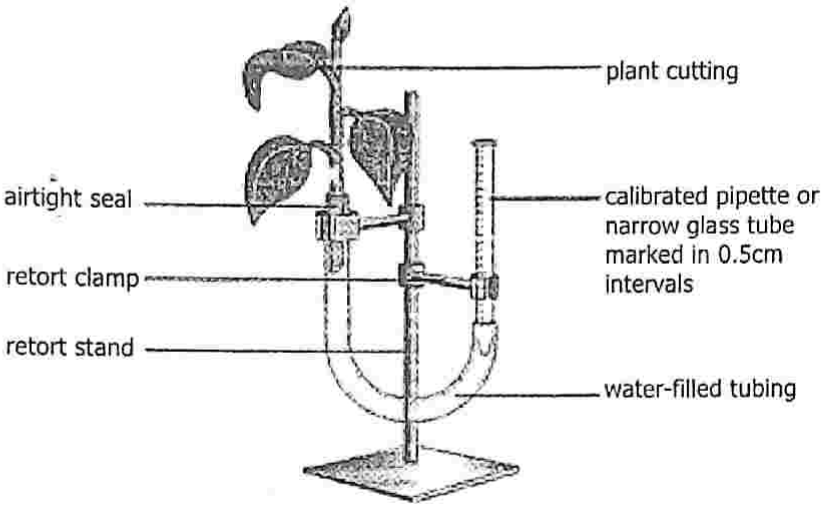
(e) What term is given to the sources of water shown in the diagram above? [1]

(f) Suggest **one** other source of fresh water for drinking. [1]

Total = 6 marks

8 PLANTS AND ANIMALS

The diagram below shows a simple potometer.



(a) Explain the importance of the air tight seal in the potometer. [1]

(b) State the function of the potometer. [1]

(c) What substance would you use to prove that water is being lost by the plant in the potometer? [1]

(d) Explain the colour changes the substance mentioned in question **(c)** above would undergo when testing the water from the potometer. [1]

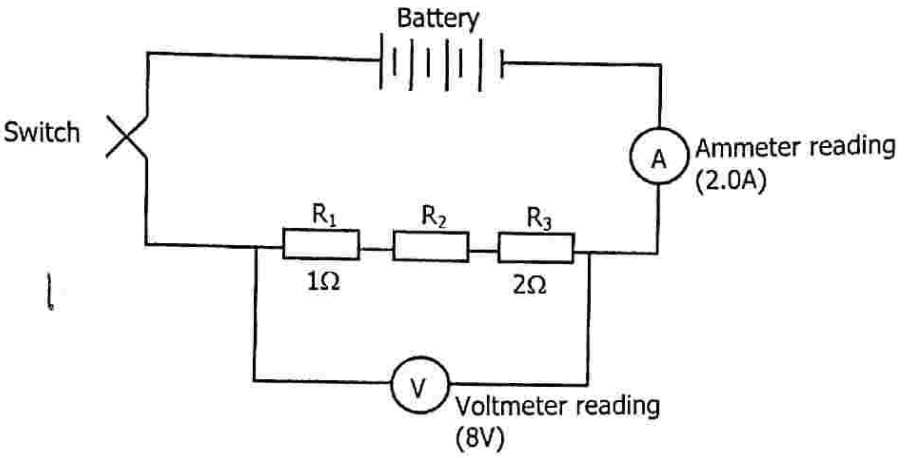
(e) Why is transpiration necessary in plants? [1]

(f) Suggest **one** way by which plants reduce water loss through transpiration. [1]

Total = 6 marks

9 ELECTRICITY

Carefully study the electric circuit diagram below.



(a) How many cells are in the battery? [1]

(b) Calculate the resistance of resistor R_2. (Show your working) [2]

(c) If the cells in the battery are of equal voltage, calculate the voltage of one cell. [1]

(d) If the resistor R_3 is removed and the circuit with the remaining resistors (R_1 and R_2) is completed by closing the switch, what will be the reading of the ammeter? [1]

(e) Calculate the total power with the remaining resistors R_1 and R_2 in the circuit when R_3 is not used. [1]

Total = 6 marks

10 MATERIALS AND ENERGY

The table below shows the chemical reactions and their products.

S/N	CHEMICAL REACTION	PRODUCTS
1	Copper heated with oxygen	Copper (II) oxide
2	Heating calcium carbonate	Calcium oxide and carbon dioxide
3	Calcium reacts with hydrochloric acid	Calcium chloride and hydrogen gas
4	Electrolysis of acidified water	Hydrogen and oxygen gases

(a) Define a chemical reaction. [1]

(b) Identify chemical reactions which can be classified as;

(i) Single replacement. [1]

(ii) Decompostion. [1]

(iii) Synthesis. [1]

(c) Suggest **two** endothermic reactions from the table. [2]

Total = 6 marks