# Hillcrest High School

Grade 8 Natural Sciences Examination June 2019

Examiners: Mrs Harmse and Mrs Salomon

Time: 2Hrs Marks: 120

---

**INSTRUCTIONS:**

1. **ALL ANSWERS** are to be written in the **SEPARATE ANSWER BOOKLET** provided.
2. **Write your name on the answer sheets.**
3. If you make a mistake, cross it out and rewrite it neatly
4. All answers are to be in **blue** or **black** ink.

## SECTION A

1. Choose the most correct answer. ***Write down the number of the question and the letter you choose only. E.g. 1. A***

1.1 Electrons are

A. Negatively charged particles
B. Neutral particles
C. Found in the nucleus
D. Are positively charged particles

1.2 The green pigment found in a leaf is called

A. Stroma
B. Chloroplast
C. Chlorophyll
D. Starch

1.3 Micro-organisms that have hyphae

A. Viruses
B. Protists
C. Bacteria
D. Fungi

1.4 A diatomic molecule

A. Is still considered to be an element
B. Can be found on the Periodic Table
C. Is an impure substance formed by a chemical reaction
D. Is a mixture

1.5 A Hypothesis

A. Lists the apparatus to be used in an investigation
B. Is an educated guess at the outcome of an investigation
C. Sums up the final outcome
D. Is always correct

1.6 The elements on the Periodic Table were arranged by:

A. Antoine Lavoisier
B. Democritus
C. James Chadwick
D. Dmitri Mendeleev

1.7 The collective name for the lithosphere, hydrosphere and atmosphere is

A. an ecosystem
B. all biotic factors on earth
C. the biosphere
D. all the non-living factors on earth

1.8 The following variable is under the control of the experimenter

A. Independent
B. Constant
C. Dependent
D. None of the above

1.9 The mosquito is responsible for carrying:

A. The Malaria parasite
B. HIV
C. TB Bacteria
D. Cholera

1.10 The gas required for the process of photosynthesis is:

A. Oxygen
B. Hydrogen
C. Carbon dioxide
D. Nitrogen

[10x1=10]

**2 Give the correct scientific name or term for the following:**

2.1 Organisms that are able to make their own food

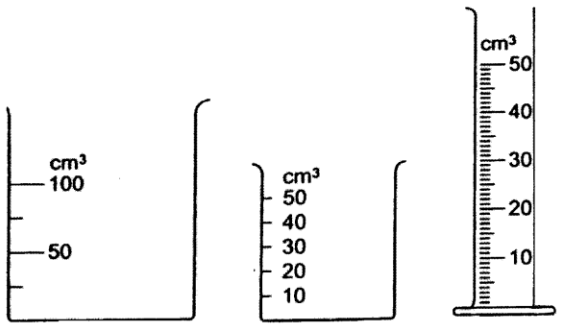
2.2 The spontaneous spreading of particles from an area of high concentration to an area of low concentration.

2.3 Phase of Matter that is held together by very strong forces of attraction between them.

2.4 The non-living aspects of an ecosystem

2.5 Organisms that feed on dead organic matter (5)

**3. Study the diagrams below and answer all the questions:**




**A** **B** **C**

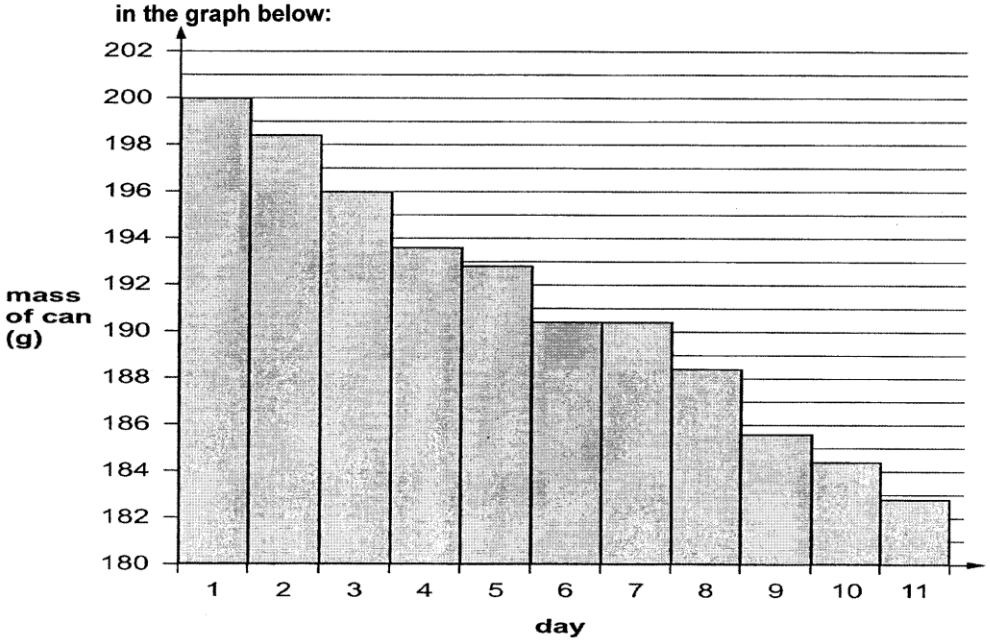
3.1 Provide names for the apparatus A and C. (2)

3.2 Which piece of apparatus would be best to use for measuring 15ml of liquid? Give a reason for your answer. (2)

3.3 When heating liquids in apparatus A we need to use a Tripod Stand. Give the correct name of the wire netting that is placed on top of the Tripod Stand. (1)

**[5]**

**4. Anna has a can of deodorant that she uses once a day. Before she uses the deodorant she measures the mass of the can. Her results are shown in the graph below:**



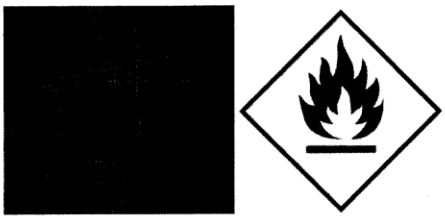
4.1 Tabulate the results. (4)

4.2 Name the constant variable. (1)

4.3 Which two days show an anomaly in the results? Explain your answer. (2)

4.4 When Anna sprays the deodorant one can soon smell it all over her bedroom. Explain what has happened in terms of your knowledge of the particle model of matter. (3)

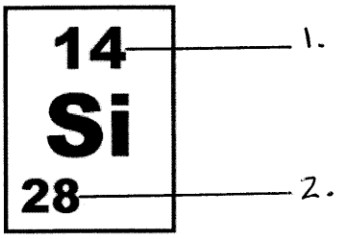
4.5 This hazard symbol appears on the can.



4.5.1 What does it mean? (1)

**[11]**

**5. Study the diagram below and answer the questions that follow.**




5.1 Provide labels for numbers **1 and 2** (2)

5.2 How many electrons are there in this atom? (1)

5.3 If the mass number for this atom is 28, calculate the number of neutrons it will have. Show all working. (2)

5.4 Name this element and state in which group it is found? (2)

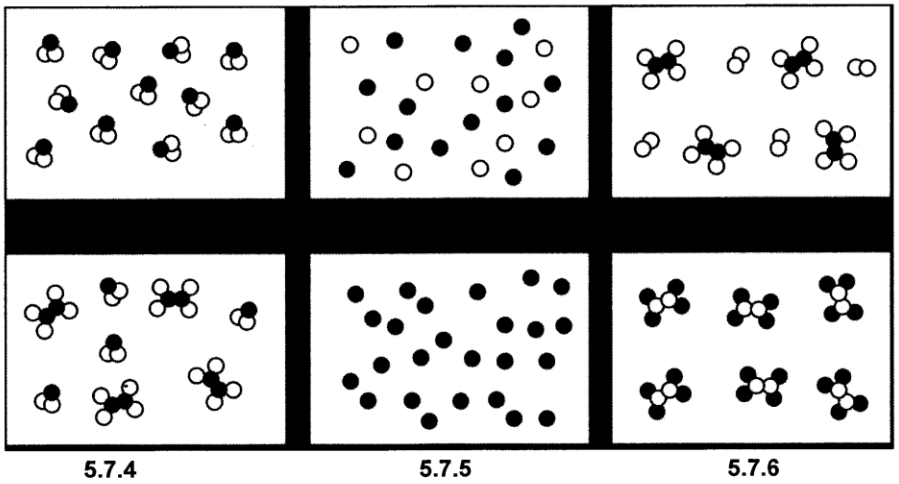
5.5 Potassium Permanganate ( $KMnO_4$ ) was used in an experiment in the Laboratory. State how many elements can be found in Potassium Permanganate. (1)

5.6 Name the element that can be found in Period 3, Group 2. (1)

5.7. Observe the matter below. You must classify the matter in each block using only the letters A to E to identify the categories:

- A = element
- B = compound
- C = mixture of elements
- D = mixture of compounds
- E = mixture of elements and compounds

Only write the question no. and the letter in your answer booklet (e.g. 5.7.1. A)

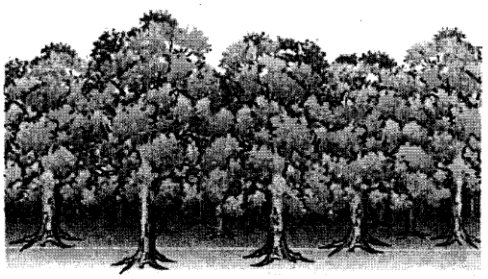



(6)

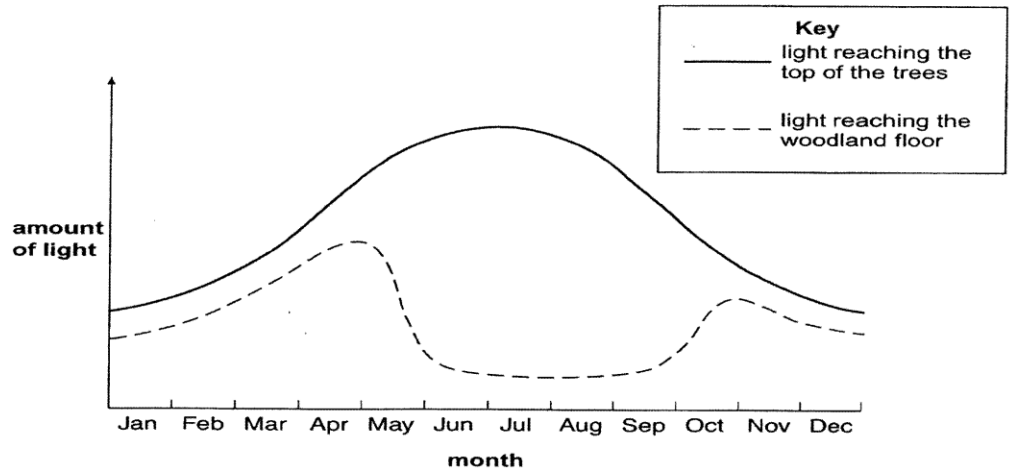
**[15]**

**6. Study the diagrams below showing a woodland in England and a graph showing the amount of light on the woodland and answer the questions that follow:**

**beginning of May**



**end of May**




6.1 During which month/s does the amount of light reach its highest intensity? (1)

6.2 Study the trend in the two graphs. What do you notice about the amount of light reaching the top of the trees and the ground? (2)

6.3 In between the trees on the ground, small plants grow e.g. ferns. Why would there be so little light reaching the floor plants during May to August? (2)

6.4 Name the chemical process that occurs in plants which requires light. (1)

6.5 Write out the chemical equation for this process in **words.** (3)

6.6 Explain how plants that grow on the floor of the woodland have adapted to survive. (1)

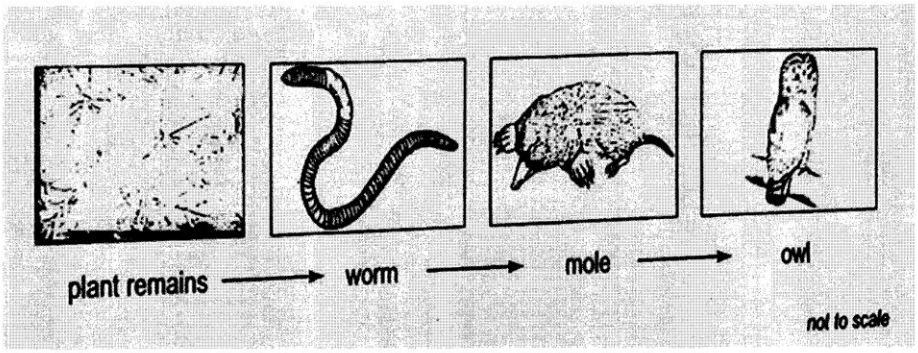
**[10]**

**7. The drawing below shows a mole. Moles dig tunnels through the soil.**

7.1 Give one observable way in which a mole is suited for digging through soil. (1)

7.2 One type of mole, the Golden Mole does not have any eyes. Why is this? (1)

7.3 Moles form part of the Food Chain. Study the Food Chain below:




a) Which organism would be eaten by the worm? (1)
b) Name the Secondary Consumer in the Food Chain. (1)
c) Which other term can be used for the Producer? (1)
d) If the moles were all killed and lost from the Food Chain, what effect would it have on the other organisms? (2)
e) Give one example of a decomposer from the Food Chain above and explain why decomposers are so important in ecosystems. (2)
f) What do the arrows represent in a Food Chain? (1)
g) Draw an Energy/Ecological Pyramid using the Food Chain above. Remember to label the Trophic Levels and the different Consumer Levels (4)
h) Approximately what percentage of energy is lost between each Trophic Level? (1)

**[15]**

**8. Read the passage below and answer the questions that follow:**

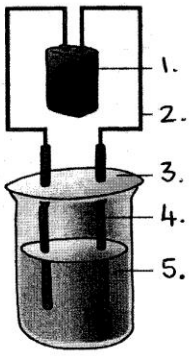
*Thando and Sipho are twins and they share the same bedroom at home. They are 5 years old and go to a pre-school in the neighbourhood. Last week, both came home from pre-school feeling sick, but they did not have the same symptoms. Sipho had a runny nose and was sneezing a bit but he still managed to enjoy his dinner. Thando went straight to bed after coming home and lay there shivering with a fever. His body was aching, and he did not eat his dinner.*

8.1 Redraw the below table into your answer booklets and complete using your knowledge of viral and bacterial diseases. Please provide a **Heading** for your table.

| | SIPHO | THANDO |
|---|---|---|
| SYMPTOMS: | | |
| IS IT A BACTERIAL OR VIRAL INFECTION | | |
| TREATMENT | | |
| POSSIBLE ILLNESS | | |

**[10]**

**Question 9 – observe the diagram below which shows the decomposition of copper chloride and answer the following questions:**

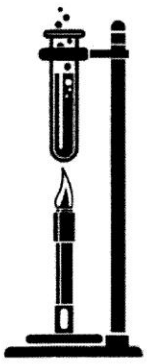



9.1 Provide labels for 1, 4 and 5. (3)

9.2 Give the term used when decomposition of a compound occurs with the use of electricity. (1)

9.3 Copper Chloride is broken down when an electric current is passed through it. Explain in detail the process and state what happens at each electrode (anode and cathode). (3)

9.4 In the science laboratory another decomposition experiment was conducted using a test-tube, a test-tube holder, a Bunsen burner, a wooden splint and a chemical called Potassium Permanganate.

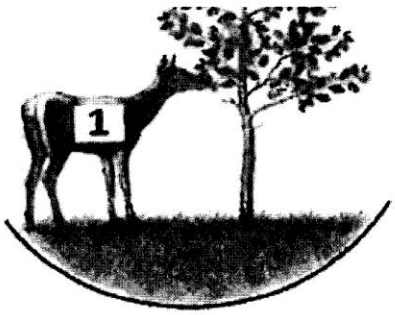


9.4.1 The students noticed that a gas was being released when the chemical was heated up. Name the gas being released and state the test for this gas. (2)

9.4.2 Name TWO safety precautions that need to be followed during this experiment. (2)

**[11]**

**Question 10 – study the diagram below and answer the following questions:**




10.1 Name the process that takes place in the cells of the organism labelled 1. (1)

10.2 The equation for this process is:

$$\text{glucose} + \text{oxygen} \longrightarrow \text{carbon dioxide} + \text{water} + \text{energy}$$

10.2.1 Describe where each reactant for this process comes from. (2)

10.2.2 Energy is seen at the end of this process. What is the energy needed for? Give an example. (2)

**[5]**

**Question 11 – Read the Case Study below and answer the following questions:**

## *1877 to 1887 (Pasteur As a Microbiologist)*

### *Germ Theory of Disease*

*The discovery of the germ theory of disease remains the pinnacle of Louis Pasteur's scientific career. With his use of microbiology for medicine and surgery he proved that many diseases were caused by the presence of foreign micro-organisms. In that connection, he carefully studied and discovered various infectious diseases such as staphylococcus, streptococcus and pneumococcus. He followed his discovery of germ theory with the utilization of vaccines to prevent diseased like cholera, anthrax and swine erysipelas.*

*With his analysis and treatment methods for infectious diseases, Pasteur established the immunology branch of science.*

### *Rabies*

*Development of vaccine against rabies was the last and the most famous success in the long career of Pasteur's research. Rabies attacked the nervous system and it was considered a dreadful disease for its symptoms and treatment. At first, even Pasteur failed to find and isolate the germ, but with his excellent experimental method he eventually succeeded. Then, for the first time on July 6th, 1885 he treated 9-years old Joseph Meister with his anti-rabies vaccine and the kid recovered perfectly. This milestone transformed Pasteur into a legend. In 1888, Pasteur Institute was inaugurated in Paris for treatment of rabies and other diseases. Louis Pasteur - the French National hero died in 1895 at Marnes la Coquette.*

11.1 What does a microbiologist do? (1)

11.2 What did the 'germ theory' prove? (1)

11.3 Streptococcus is a bacterium that is round in shape, name TWO other shapes of bacteria. (2)

11.4 Name two vaccines other than the rabies vaccine that prevent diseases. (2)

11.5 How does rabies damage a person's body? (1)

11.6 Why was it important for Pasteur to isolate the rabies germ? (1)

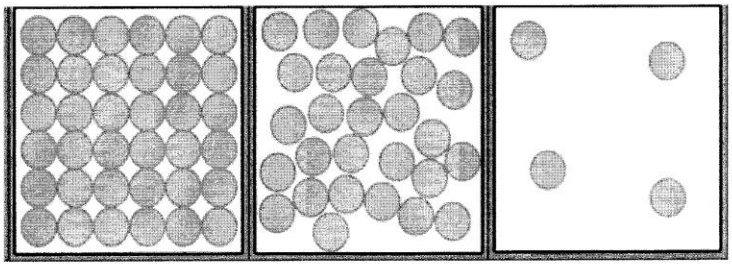
11.7 Name the type of micro-organism that rabies falls under. (1)

11.8 What nationality was Louis Pasteur? (1)

11.9 Micro-organisms can be used for the benefit of humans. Name THREE beneficial ways that we use micro-organisms in our everyday lives. (3)

**[13]**

**Question 12 – The diagram below shows the 3 different phases of matter. In the answer booklet ONLY write the question number and the answer e.g. 12.1 Large spaces**



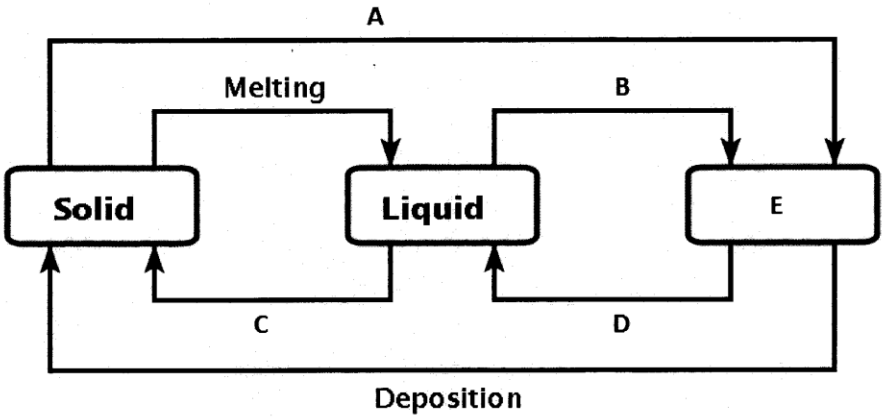
A B C

| | | | |
|---|---|---|---|
| Arrangement of particles | 12.1 | | 12.2 |
| Movement of Particles | 12.3 | | |
| Forces between particles | | | 12.4 |
| Spaces between particles | | 12.5 | |

(5)

**12.6 Study the diagram below showing how matter changes phase and fill in the missing terms. In your answer booklet write only the Letter and the Answer.**

**Example: 12.6 H – melting**




(5)

**Total: 120 marks**