HILLCREST HIGH SCHOOL

Natural Science **GRADE 8**

November Exam

TERM 4 2020

Examiner: Mrs Harmse **Moderator: Mrs L. Prior**

TIME: 2 hours **MARKS: 100**

Instructions:

Read the following instructions carefully before answering the questions.

1. Answer all the questions.
2. Number your answers exactly as the question numbers provided.
3. Non-programmable calculators may be used.
4. Write neatly and legibly in blue or black ink.

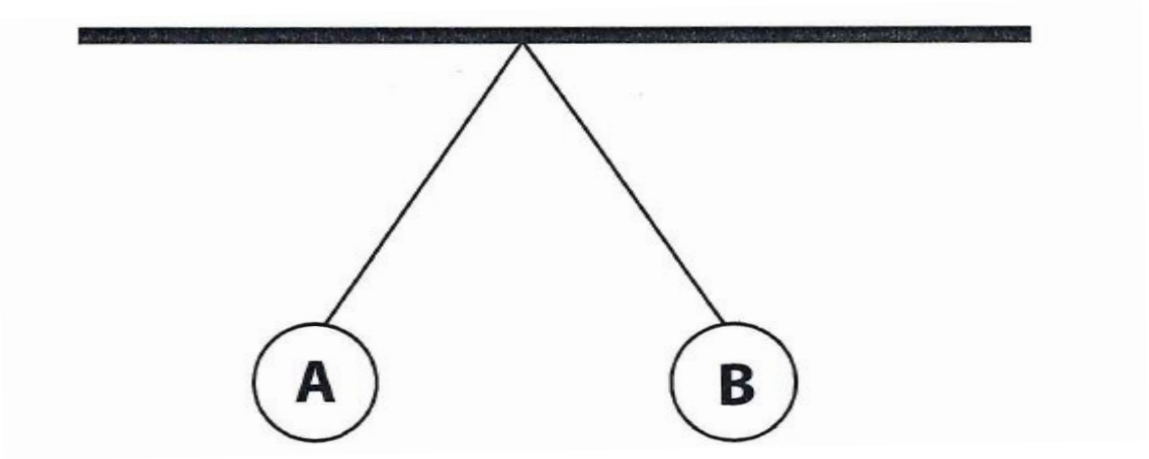
QUESTION 1

A number of answers are provided for each question.

Read the question and choose the most suitable answer from those provided.

Write only the letter that agrees with your answer next to the question number.

1.1 The diagram below shows two identical spheres hanging at the same length from a point. Sphere A has a positive charge and sphere B has a negative charge.



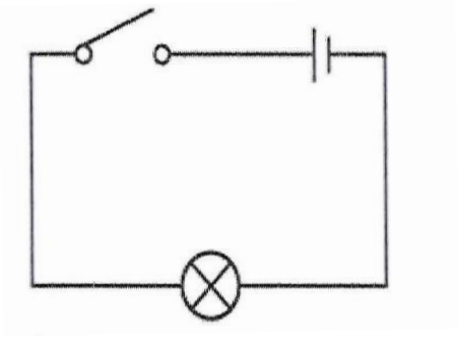
In which direction will each sphere move?

	Sphere A	**Sphere B**
A.	Away from sphere B	Away from sphere A
B.	Away from sphere B	Towards sphere A
C.	Towards sphere B	Towards sphere A
D.	Towards sphere B	Away from sphere A

1.2 When light passes through a prism, which coloured frequency bends the most and which coloured frequency bends the least?

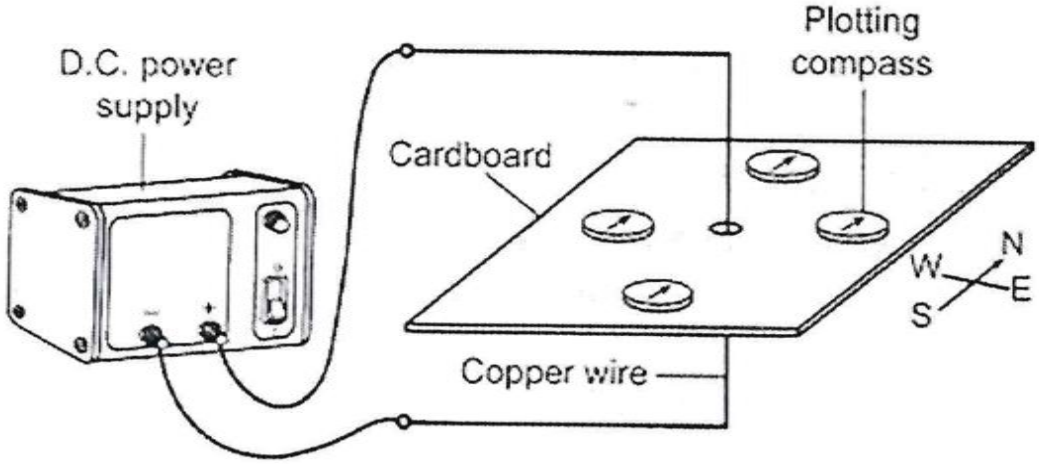
A. Red bends the most and violet bends the least.
B. Green bends the most and indigo bends the least.
C. Violet bends the most and red bends the least.
D. Red bends the most and indigo bends the least.

1.3 The following circuit diagram is made of connecting wires…



A. An open switch, a cell and a lamp connected in series.
B. An open switch, a cell and an ammeter connected in series.
C. A closed switch, a cell and a rheostat connected in parallel.
D. An open switch, a cell and a buzzer connected in series.

1.4 The diagram below shows an investigation into…

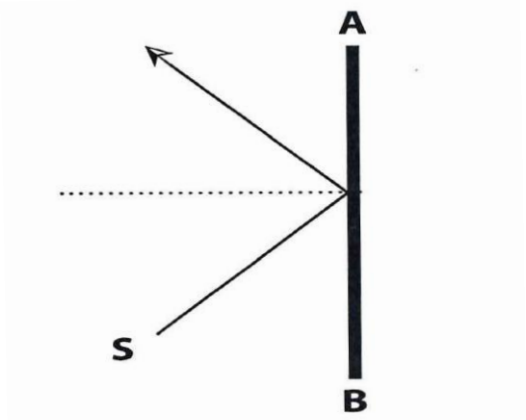


A. The heating effect of an electric current.
B. The magnetic effect of an electric current.
C. The chemical effect of an electric current.
D. The mechanical effect of an electric current.

1.5 A red object appears red as it…

A. Absorbs the red frequency of light.
B. Absorbs all frequencies of light except red light.
C. Reflects all frequencies of light.
D. Absorbs all frequencies of light.

1.6 A single beam of white light is shone from a source S against a smooth, shiny surface AB as seen in the diagram below.



If the angle of incidence is 20^{o} then the angle of reflection will be…

A. 18^{o}
B. 20^{o}
C. 22^{o}
D. 24^{o}

1.7 The apparent depth of an object seen in water is shallower than the actual depth of the object. This phenomenon is caused by the…

A. Reflection of light.
B. Colour of light.
C. Rarefaction of light.
D. Refraction of light.

1.8 Atoms consist of…

A. Elements and compounds.
B. Neutrons, electrons and compounds.
C. Protons, electrons and neutrons.
D. Elements, compounds, neutrons, electrons and protons

1.9 Jade wants to test whether the gas produced during an experiment is carbon dioxide gas. Which of the following reactants can Jade use to test for the presence of carbon dioxide gas?

A. Copper hydroxide.
B. Milky white lime water.
C. Clear lime water.
D. Iodine solution.

1.10 Which one of the following is NOT an example of a compound?

A. H_20
B. O_2
C. $CuCl_2$
D. CO_2

[1x10 = 10]

QUESTION 2

State whether each of the phrases in COLUMN I applies to A only, B only, both A and B or none in COLUMN II.

Write down A only, B only, both A and B or none, next to the question number.

For example: 2.11 None

COLUMN I	**COLUMN II**
2.1 Unlike charges	A. Attract B. Repel
2.2 Conductor	A. Graphite B. Copper
2.3 Potential energy	A. Lamp B. Cell
2.4 Compound	A. Copper B. Chlorine
2.5 Opaque	A. Clay B. Glass

[5x1=5]

QUESTION 3

3.1 An investigation is conducted to find out which substance can conduct electricity. An electrical circuit was set up using a cell, copper connecting wires, a light bulb, crocodile clips and a switch as shown below.

Different substances are tested by placing them between the crocodile clips and closing the switch to complete the circuit.

The different substances tested are: steel wool, nichrome wire, cotton thread, rubber band and string. The results of the experiment are provided in the table below.

Substance tested	**Appearance of light bulb**
Steel wool	Bright
Nichrome wire	Bright
Cotton thread	No light
Rubber band	No light
string	No light

3.1.1 State the aim of the experiment. (1)

3.1.2 Name the independent variable in the experiment. (1)

3.1.3 Name the dependent variable in the experiment. (1)

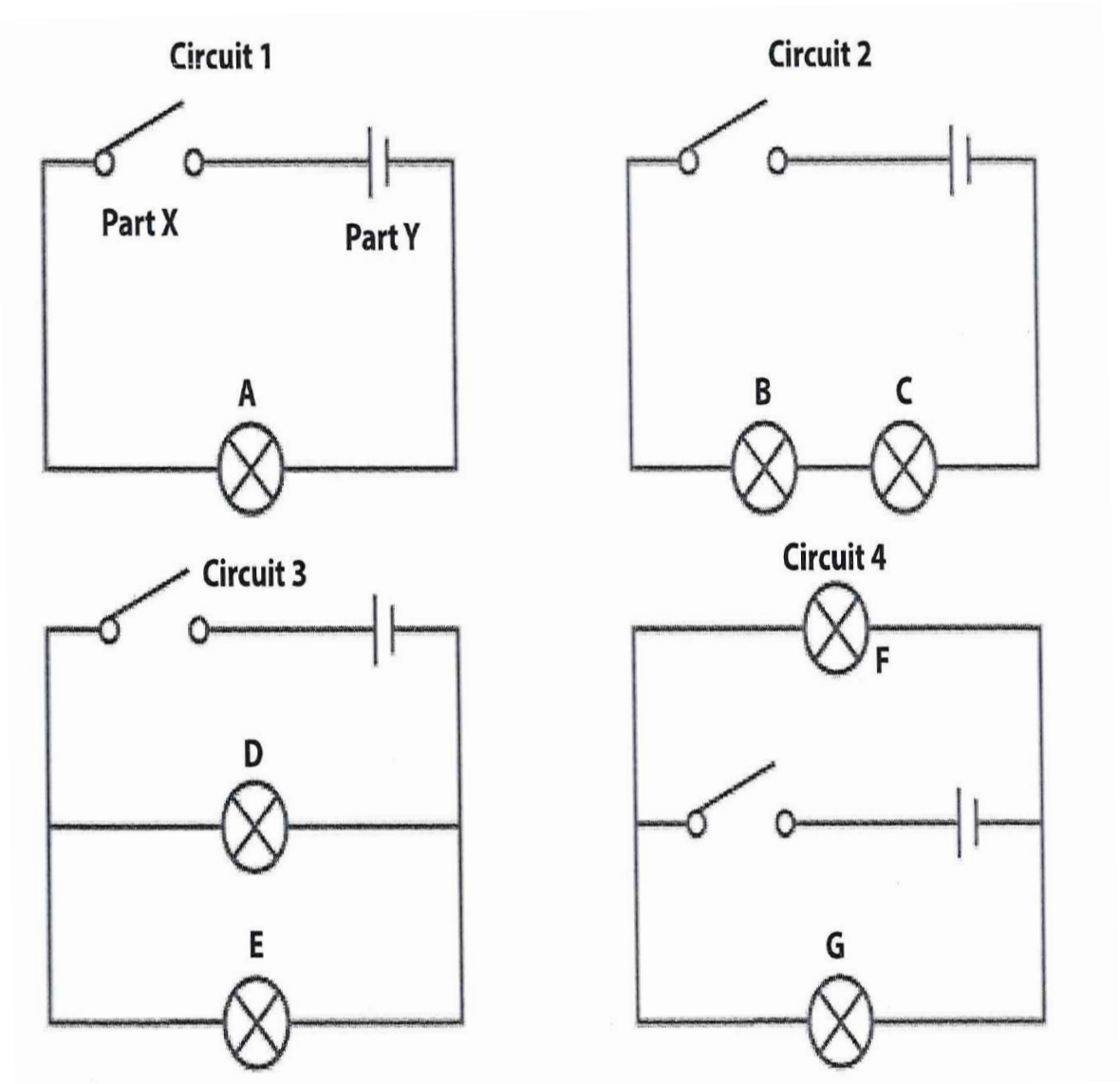
3.1.4 Give TWO fixed (controlled) variables for the experiment. (2)

3.1.5 How will you know if a substance you test is a conductor or an insulator? (2)

3.1.6 Provide a conclusion to the investigation. (2)

3.1.7 How can you improve the investigation in terms of measuring the actual amount of current flowing in the circuit? (1)

3.2 Study the diagram of four circuits used in an investigation into the effect of connecting light bulbs in series and in parallel.



3.2.1 Identify parts X and Y. (2)

3.2.2 State a hypothesis for this investigation. (2)

3.2.3 Compare the brightness of bulbs A, B and C when both circuits 1 and 2 are closed at the same time for the same length of time. (3)

3.2.4 Compare the brightness of bulbs D, E, F and G when both circuits 3 and 4 are closed at the same time for the same length of time. Provide TWO reasons for your answer. (3)

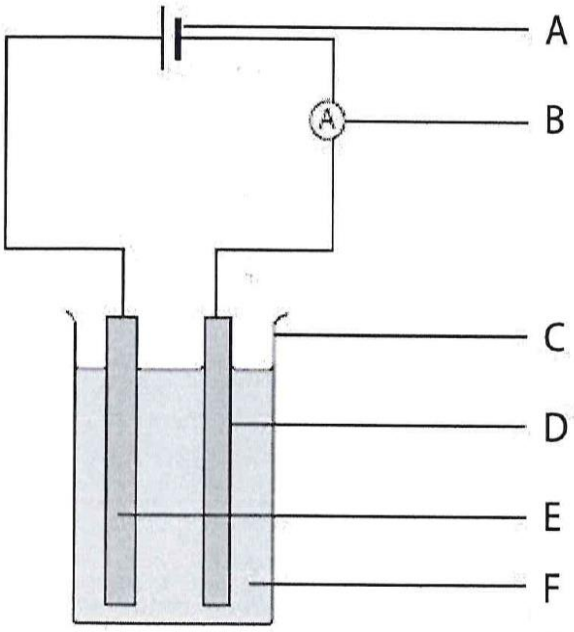
[20]

QUESTION 4

4.1 The diagram shows a woman combing her hair.

Explain how combing hair causes the hair to stand on end and crackle when the air is very dry. (2)

4.2 The diagram below shows an effect of an electric current in a copper chloride solution.



4.2.1 Name the chemical process occurring in the diagram. (1)

4.2.2 Which part changes potential chemical energy into electrical energy? (2)

4.2.3 What substance is part D and E made of? (1)

4.2.4 Which part is known as the anode? (1)

4.2.5 Which part is coated with copper after a few minutes? (1)

4.2.6 Which is an electrode? (1)

4.2.7 At which part is chlorine gas made? How do you know? (2)

4.3 Which substance is the electrolyte in this investigation? (1)

4.4 What precautions need to be taken when carrying out this investigation? (1)

4.5 Name THREE effects of an electric current. (3)

[16]

QUESTION 5

5.1 Mass is measured in the following unit.

A. cm
B. g
C. g.cm
D. m

5.2 The unit for volume is

A. cm
B. g/cm^3
C. kg
D. cm^3

5.3 The formula for determining the volume of a rectangular block is

A. l x b
B. l + b + h
C. l x l x l
D. l x b x h

5.4 The density of silver is 10,5g/cm^3. Which one of the following statements is true?

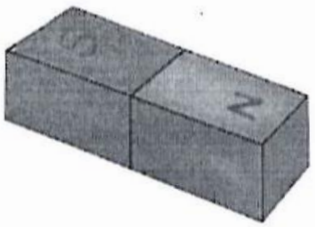
A. The mass of 2cm^3 of silver is 5,25g
B. 105g of silver occupies a volume of 100cm^3
C. 1000cm^3 of silver has a mass of 10,5kg
D. 1cm^3 of silver has a mass of 1,05kg

[8]

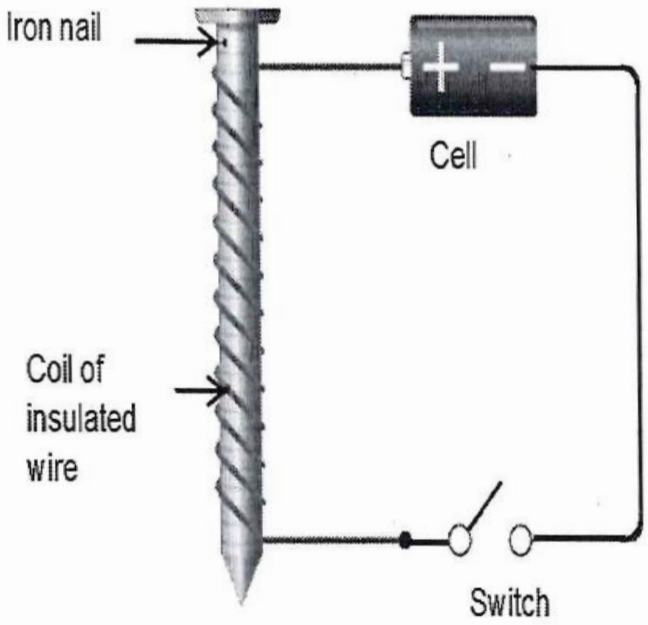
QUESTION 6

Study the diagrams of a bar magnet and of an electromagnet. Answer the questions that follow.

Bar magnet



Electromagnet



6.1 Which of the two magnets is NOT a permanent magnet? Explain your answer. (2)

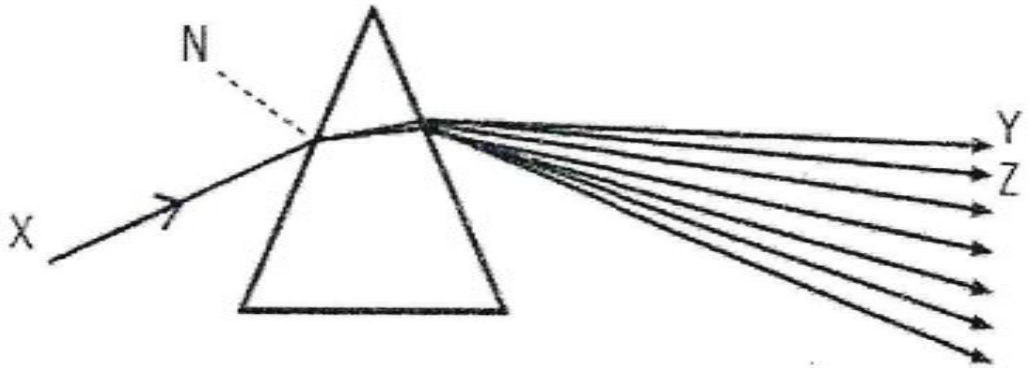
6.2 Name two ways in which you can increase the magnetic force of the electromagnet. (2)

6.3 Give one example of using an electromagnet in everyday life. (1)

[5]

QUESTION 7

When a beam of light falls onto a glass prism, it breaks up into seven different colours as shown in the diagram below. Answer the questions that follow.



7.1 Write down the colours of light, represented by X, Y and Z in the diagram. (3)

7.2 Name the dotted line in the diagram indicated by N. (1)

7.3 Give the scientific term for:

a) White light splitting up into seven colours when passing through a triangular glass prism. (1)

b) The range of seven different colours of light which is observed. (1)

7.4 Refer to light that is absorbed and reflected and explain why a leaf appears green when light shines on it. (4)

[10]

QUESTION 8

Study the periodic table which has been attached to your paper and answer the questions below.

8.1 Write down the symbol for Lithium. (1)

8.2 Give the following information about Lithium:

a) Atomic number
b) Mass number (2)

8.3 State whether the following elements listed are: Mg, He, H, Si

a) Metals
b) Non-metals
c) Semi metals (4)

8.4 Draw a bar graph showing the different atomic masses of the following elements. F, C, Be, O. (4)

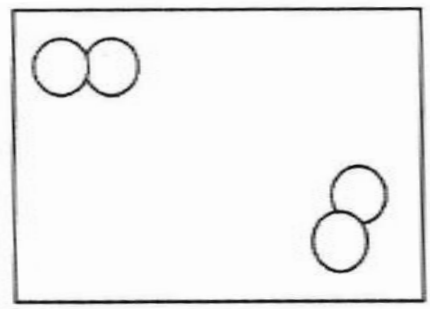
8.5 Study the atom of Na on your periodic table.

a) How many protons does it have? (1)
b) How many electrons does it have? (1)
c) What is the relationship between the number of electrons and protons in an atom? (1)
d) How many neutrons are there in this atom? (1)
e) Give the name for the compound NaCl? (1)

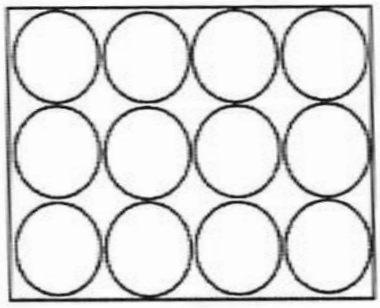
[16]

QUESTION 9

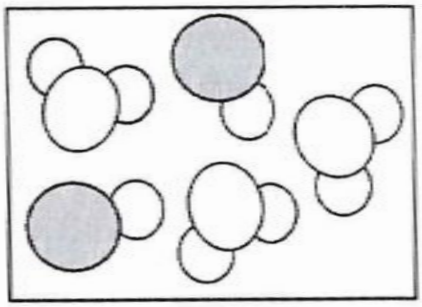
9.1 The particle model of matter can be used to represent different substances.



A



B



C

9.1.1 Which diagram A, B or C represents a diatomic molecule? Give a reason for your answer. (2)

9.1.2 Compare the three phases of matter in terms of the forces between the particles. (3)

9.1.3 How many types of molecules are found in diagram C? (1)

9.1.4 Which diagram represents particles with the highest average kinetic energy? Explain your answer in terms of the particle model of matter. (2)

9.1.5 Why does diffusion not take place in B? (2)

[10]

GRAND TOTAL: 100 marks