HILLCREST HIGH SCHOOL

NATURAL SCIENCE EXAMINATION

Grade 8 **November 2015**
Time: 2 hours **Marks: 150**

Instructions:
1. READ ALL INFORMATION CAREFULLY!
2. Answer ALL the questions.
3. Number your answers exactly as they are numbered in this question paper.
4. Answer all multiple choice questions by choosing the most correct answer. Only write the number and the correct answer in your answer booklet. E.g. 1.1 D
5. Work neatly and clearly.

Question 1 - multiple choice

1.1 Two objects have the same charge. What would the objects do if placed near each other?
- A repel
- B attract
- C nothing
- D stick together

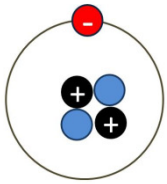
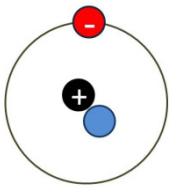
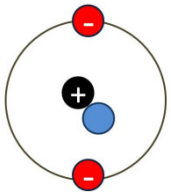
1.2 Which form of electric discharge appears in nature?
- A rain
- B ocean currents
- C lightning
- D volcanoes

1.3 Why does static electricity move from you to a metal object after you have walked over new carpet?
- A It is attracted to the metal.
- B It is attracted to you.
- C It is attracted to the carpet
- D It is made in your shoes.

(6)

Question 2

Look at the diagrams of atoms below and state the charge on each one.

2.1	2.2	2.3
		

(3)

Question 3

Bob is trying to comb his hair, but it keeps standing up. Explain how this happens.

(4)

Question 4 – multiple choice

4.1 Which one of the following is not a source of light?

A sun
B moon
C candle
D torch

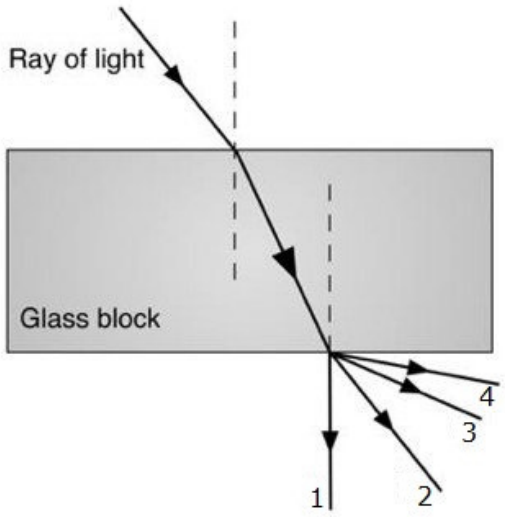
4.2 When white light strikes Peter's shirt, the shirt looks blue. Which of the following best explains the reason for this?

A It absorbs all the white light and turns most of it into blue light.
B It reflects the blue part of the light and absorbs the rest.
C It absorbs only the blue part of the light.
D It gives off its own blue light.

4.3 A ray of light strikes a mirror at an angle. If the angle between the ray of light and the normal is 40°, what will the angle of reflection be?

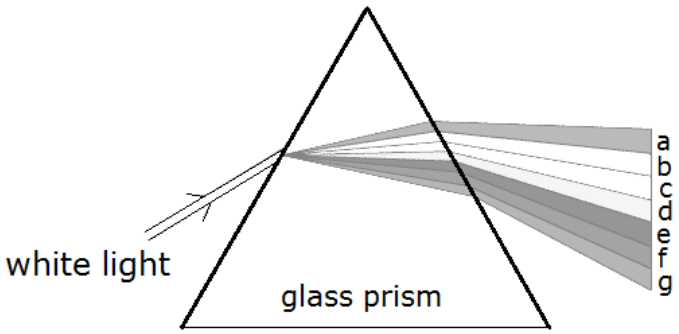
A 40 °
B 50 °
C 140 °
D 20 °

4.4 A ray of light passes through a glass block as shown. In the glass block it changes direction. Which one of the rays is most likely to leave the glass block?



A 1
B 2
C 3
D 4

4.5 The diagram shows the band of colours that white light is separated into when it passes through a triangular prism. The colour of the band marked "**b**" is:



A red
B orange
C blue
D indigo (10)

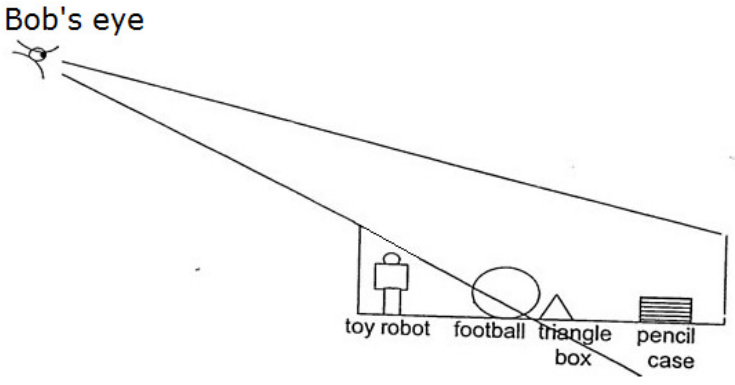
Look carefully at the table below. Match the statement in Column A with the correct term in Column B. Write only the question number and the letter of the correct term.

Column A		Column B	
4.6	matter that allows all visible light to pass through	A	translucent
4.7	separation of white light into different colours	B	transmission
4.8	matter that does not allow visible light to pass through it	C	dispersion
4.9	matter that transmits but scatters visible light	D	transparent
4.10	passage of light through matter	E	opaque

(5)

Question 5

Bob looks into a box from a distance. A football, a toy robot, a triangle box and a pencil case are placed in the box.

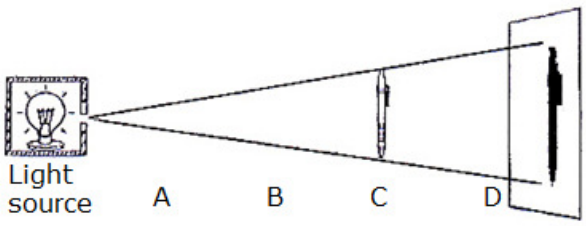


5.1 Which object(s) is he not able to see at all? (1)

5.2 Give a reason for your answer above. (1)

Question 6

Jane wanted to find out how the distance between a light source and a pen would affect the size of the shadow cast by the pen. She used a light source and placed the pen at position C as shown in the diagram below. She then observed the shadow formed on a screen fixed on a wall.

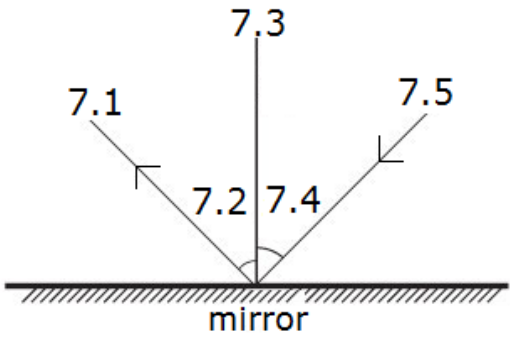


6.1 How would the size of the shadow change if Jane moved the pen from position C to position D? (2)

6.2 How would the size of the shadow change if Jane moved the pen from position C to position A? (2)

Question 8

Look at the diagram of a ray of light being reflected by a mirror. Provide names for the parts labelled 8.1 to 8.5. Write only the question number and the name as your answer.



(5)

Question 9 – multiple choice

9.1 What will happen if you add more batteries to an electrical circuit containing light bulbs?

A There is no change.
B The bulbs will become dim.
C The bulbs will be brighter.
D The bulbs will last longer.

9.2 Which material acts as a conductor of electricity?

A wooden ice cream stick
B rubber glove
C plastic button
D paper clip

9.3 Ken wanted to make a light bulb glow. Which set of materials would he need?
A paper cup, paper clip, and a wooden ice cream stick
B battery, wire, and a light bulb
C button, battery, and a rubber glove
D battery, paper, and a bulb

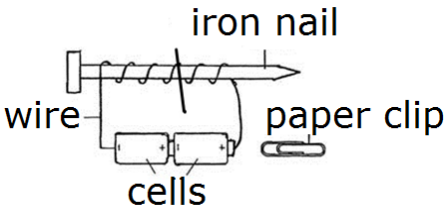
9.4 When performing an experiment with electricity, which material would act as an insulator?
A staple
B wooden ice cream stick
C wire
D paper clip

9.5 Which type of electricity moves along a pathway to turn on a light?
A static electricity
B lightning
C turbine electricity
D current electricity

(10)

Question 11

Mbali made an electromagnet with 2 cells, an iron nail and a piece of wire. The set-up is shown below.



She tested her electromagnet and recorded the results in the table below.

Number of wire coils around the nail	10	20	30	40
Number of paper clips attracted by the nail	1	1	2	2

11.1 What is the energy source in Mbali's experiment? (1)

11.2 What will happen to the iron nail when the switch is closed? (1)

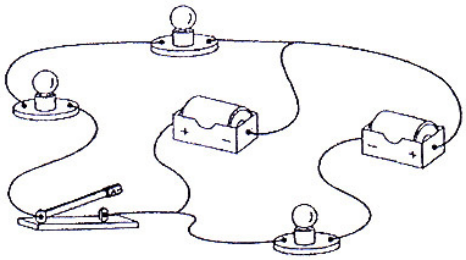
11.3 How did Mbali increase the strength of the electromagnet in her experiment? (1)

11.4 Suggest another thing that Mbali could do to increase the strength of her electromagnet. (1)

11.5 Describe one other use for electromagnets in everyday life. (1)

Question 12

12.1 Draw a circuit diagram of the circuit pictured below.

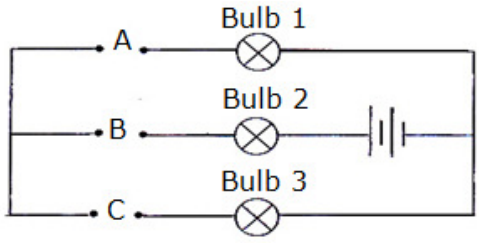


(5)

12.2 Is the circuit in the diagram a series circuit or a parallel circuit? Explain your answer. (2)

Question 13

A Grade 8 class conducted an experiment to test conductors and insulators. They set up a circuit as shown in the diagram below.



If a toothpick is placed at A, a magnet is placed at B and a glass rod is placed at C, which of the bulb/s in the circuit will light up? Give a reason for your answer. (2)

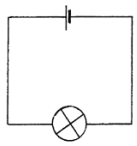
Question 14

A buzzer is a type of output device in an electric circuit. Draw an energy conversion flow diagram for a buzzer.

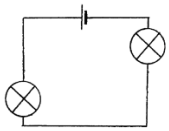
(2)

Question 15
Look carefully at each of the circuit diagrams below before answering the questions that follow.

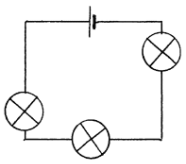
A



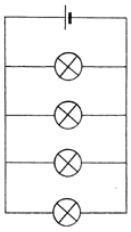
B



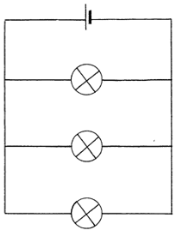
C



D



E



15.1 If one of the bulbs in circuit C breaks, will the other lights continue to shine? Give a reason for your answer. (2)

15.2 In which of circuits A, B or C would the bulbs shine more brightly? Give a reason for your answer. (2)

15.3 In which of circuits D or E would the bulbs shine more brightly? Give a reason for your answer. (2)

Formula: Density = Mass/Volume

Question 16 – multiple choice

16.1 The particles in a liquid cannot support the particles of a solid unless …...
- A The liquid is less dense
- B The liquid particles have less attractive forces between them.
- C The solid particles have more attractive forces between them
- D The solid is less dense

16.2 The following statement "All liquids are less dense than all solids and more dense than all gases" was made by a Gr. 8 student. Which of the following substances proves this student's statement to be incorrect?
- A Mercury
- B Granite
- C Iron
- D Helium

16.3 If a substance has a volume of 100cm3 and has a mass of 1932 grams, what is the density of the substance?
- A 193.20 g/cm
- B 19.32 g/cm
- C 1.932 g/cm
- D 0.1932 g/cm

16.4 Which of the following is a good definition of mass?
A How much stuff in an area.
B The amount of matter in an object.
C The weight of an object.
D The density of a volume.

16.5 What is the first thing you must do if a fire breaks out during an experiment that you are working on in the school's laboratory?
A Quickly run out the laboratory
B Start screaming to draw attention to the fire
C Throw your school blazer over the flames to kill the fire
D Tell your teacher immediately

16.6 What should one do quickly if some liquid splashed into your eyes in a laboratory?
A Put safety glasses on.
B Wash your eyes out with lots of water.
C Rub your eyes with a circular motion of the index finger.
D Get some tissue paper and dab your eyes.

16.7 Which of the following instruments could ***best*** be used to separate the components of sand mixed in water?
A filter paper and funnel
B fractionating column
C separating funnel
D centrifuge

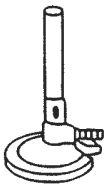
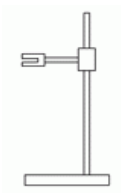
16.8 Which list of apparatus would a learner use in order to determine the density of an irregularly shaped glass object?
A a measuring cylinder, a pipette and a spring balance
B a triple beam balance, a eureka cup and a measuring cylinder
C a spring balance, a eureka cup and a pipette
D a pipette, a triple beam balance and a measuring cylinder

16.9 You are heating a substance in a test tube. Always point the open end of the tube
A toward yourself.
B toward your partner.
C. toward another classmate.
D away from all people.

16.10 When doing an experiment in the laboratory, a "control" needs to be set up. This is used to:
A compare the results with the other experiments.
B control the outcome of the experiment.
C control the constant variables.
D find out which is the dependent variable. **[20]**

Question 17

Study the pictures below and answer the following questions.

A	B	C	D
			

17.1 Provide the name for the apparatus
17.1.1 A
17.1.2 B
17.1.3 C
17.1.4 D (4)

17.2 Give the functions for the apparatus
17.2.1 A
17.2.2 C (2)

17.2 Draw a biological drawing of a measuring cylinder.
**** Remember your biological drawing rules*** (4)

17.3 Working in the laboratory with chemicals can be very dangerous.
Describe four safety precautions students need to remember when working in the school's laboratories. (4)

17.4 Study the hazard symbols below:

A	B	C	D
			

Name the hazard symbols:
17.4.1 A
17.4.2 B
17.4.3 C
17.4.4 D (4)

17.5 What does the word "corrosive" mean? (2)

Question 18

18.1 List the different steps to Scientific Method. (6)

18.2 For his Grade 8 science investigation, a student decided to investigate the effect of dissolved sucrose on the boiling point of water. He took 10 beakers and placed the following masses of sucrose into separate beakers: 0g, 10g, 20g, 30g, 40g, 50g, 60g, 70g, 80g and 90 g. He added sufficient water to each beaker to give each a total mass of 100 g, and measured the boiling point of each solution.

18.2.1 Write a hypothesis for the investigation. (2)

18.2.2 Write a suitable heading for the table below. (2)

18.2.3 What is the dependent variable? (1)

18.2.4 Control variables are kept constant during an investigation. Why is this necessary? (1)

18.2.5 Suggest two control variables for this investigation. (2)

The following results were obtained:

Mass of Sucrose (g)	Boiling Point (°C)
0	100,0
10	100,1
20	100,3
30	100,6
40	101,0
50	102,3
60	104,2
70	107,5
80	113,9
90	130,1

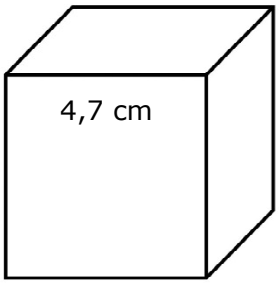
18.2.6 Plot a line graph showing these results on the graph paper provided at the back of this question paper. Remove the graph paper from the question paper. Write your name and class at the top and hand it in with your answer booklet.

(Hint - start the temperature axis at 100°C) (6)

Question 19

A regular cube made out of the plastic has sides that measure 4,7 cm and a mass of 53 g.

Density = mass / volume
Volume(of a cube) = l x b x h



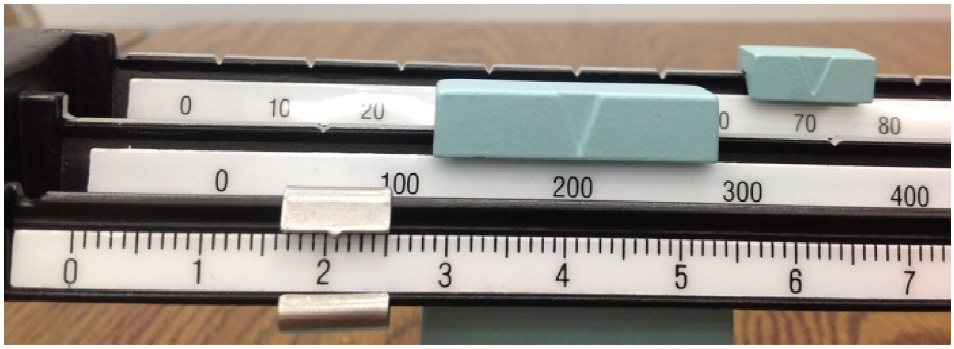
19.1 Calculate the volume of the cube. (3)

19.2 Calculate the density of the cube. (3)

19.3 Will the cube float on water? Explain your answer, stating the density of water. (3)

Question 20

A measuring cylinder containing 35ml of liquid was put on a triple beam balance. The following picture represents the mass of the cylinder and liquid.



20.1 What is the combined mass of the cylinder and liquid? (2)

20.2 If the mass of the empty cylinder is 258,55 g, calculate the mass of liquid. (2)

20.3 Calculate the density of the liquid. (3)

20.4 Define Density. (2)

20.5 Which has a higher density, a kilogram of a) aluminium or b) gold? (1)