HILLCREST HIGH SCHOOL

NATURAL SCIENCE EXAMINATION

Grade 9 **June 2014**
Time: 2 hours **Marks: 150**

Instructions:

1. READ ALL INFORMATION CAREFULLY!
2. Answer ALL the questions.
3. Work neatly and clearly.
4. A periodic table is provided at the back of this examination paper.

LIFE AND LIVING

Question 1

Answer the following questions by choosing the most correct answer. Only write the number and the correct answer in your answer booklet. E.g. 1.1 D

1.1 The order from the simplest to the most complex levels of a multicellular organism is:
- A Organs, tissues, specialized cells, organ systems
- B Specialized cells, tissues, organs, organ systems
- C Organ systems, tissues, specialized cells, organs
- D Tissues, organs, specialized cells, organ systems

1.2 Which of the following is NOT a function of the musculoskeletal system?
- A to protect the body
- B to produce red blood cells
- C to provide support to the body
- D to enable movement

1.3 Which of the following cell organelles is found in the plant cell but not in the animal cell?
- A Chloroplast
- B Mitochondrion
- C Endoplasmic Reticulum
- D Ribosome

1.4 _____ are known as the "power houses of the cell"
- A secretory granules
- B ribosomes
- C fat droplets
- D mitochondria

1.5 The reproduction of the cell is controlled by the _____.
- A mitochondrion
- B endoplasmic reticulum
- C nucleus
- D centrosome

1.6 _____ filter the blood to excrete harmful substances in the form of urine.
- A Lungs
- B Urinary bladder
- C Endocrine Glands
- D Kidneys

1.7 _____ is a disease that causes the softening and weakening of the bones.
A arthritis
B rickets
C osteoporosis
D scurvy

1.8 What is the name of the sac-like structure that stores urine?
A ureter
B bladder
C kidney
D stomach

1.9 Elastic fibres that connect the ends of bones at movable joints are known as
A tendons
B nervous tissue
C ligaments
D cartilage

1.10 The main components of the nervous system include
A the brain and spinal cord
B nerves
C ears, nose, skin, eyes and tongue
D all of the above

[10]

Question 2

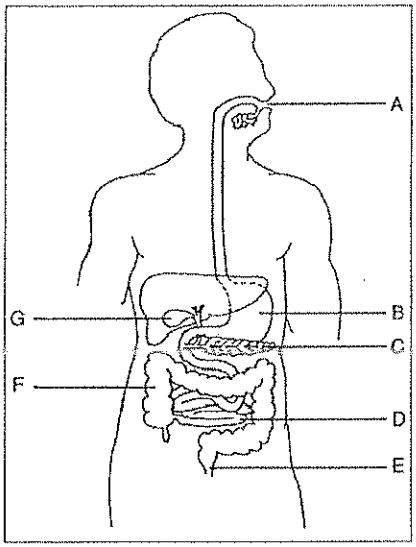
Match the words in Column A with their correct definition in Column B. Write only the question number and the letter of the correct answer.

Column A		Column B	
2.1	Vacuole	A	Cells in sense organs that detect stimuli from the environment
2.2	Neuron	B	How the water content of the body is kept constant
2.3	Receptors	C	Chemical reactions that take place in the body
2.4	Osmoregulation	D	Impulses travel along these to and from the brain
2.5	Metabolism	E	Stores substances that can be used by the cell

[5]

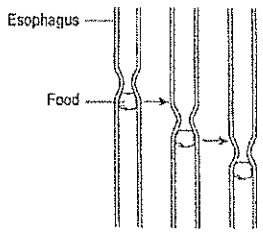
Question 3

3.1 Use the diagram below to answer questions 3.1 – 3.5. For each of the descriptions, give the letter and name of the organ. Write only the question number, and the letter and name of the correct answer.



3.1.1 The organ that secretes hydrochloric acid.
3.1.2 The organ that absorbs water back into the blood.
3.1.3 The structure where digestion begins.
3.1.4 The structure where bile is stored.
3.1.5 The structure where faeces is stored until it can be expelled from the body. (5)

3.2 The diagram on the right shows a particle of food being moved along the oesophagus by alternate waves of relaxation and contraction of the muscular walls. What is the name of this process? (1)



3.3 Name the two types of digestion and give one example of each. (4)

3.4 Match the nutrient in Column A with its function in Column B. Write only the question number and the letter of the correct answer. Each letter may only be used once.

Column A	Column B
3.4.1 Fat	A Builds strong bones and teeth and assists in blood clotting.
3.4.2 Vitamin A	B Needed for the production of red blood cells and transporting oxygen
3.4.3 Iron	C Important for good eyesight
3.4.4 Calcium	D Protect internal organs and helps to insulate your body.

(4)

3.1 Read the following extract about healthy eating before answering the question that follows.

Creating a healthier tuck-shop

Children's eating habits have changed dramatically over the last 20 to 30 years. The increased availability of high fat and sugary foods and children's tendency to like these foods are contributing to the increased incidence of behavioural problems and childhood obesity.

In South Africa we are faced with the following problems:

- A very small percentage of school aged children meet the recommended intake of the various food groups every day.
- The majority of school aged children eat too much fat.
- Many children eat less than one serving of fruit a day.
- There has been a move away from drinking milk and milk products to having more fizzy drinks.
- Added sugar and high-sugar foods contribute towards an excessive kilojoule intake in children's diets.
- High fibre, unprocessed foods are being replaced by low fibre alternatives and daily fibre recommendations are not being met.

Empowering a child to choose to eat healthily is possible with good nutrition education in the classroom. Children need to learn about how to plan their diet with a variety of nutritious foods, and these principles should be reinforced by the provision of healthy foods in the school tuck-shop.

(http://www.picknpay.co.za/eat-well-for-your-age/creating-a-healthier-tuckshop Accessed on 20 May 2014)

Suggest a healthy meal that could be sold at your school tuckshop. The meal should include all the important parts of a healthy diet, and should be suitable for eating at school. For each part of the meal, you need to state which nutrient it is providing. Set your answer out in the form of a table, as follows:

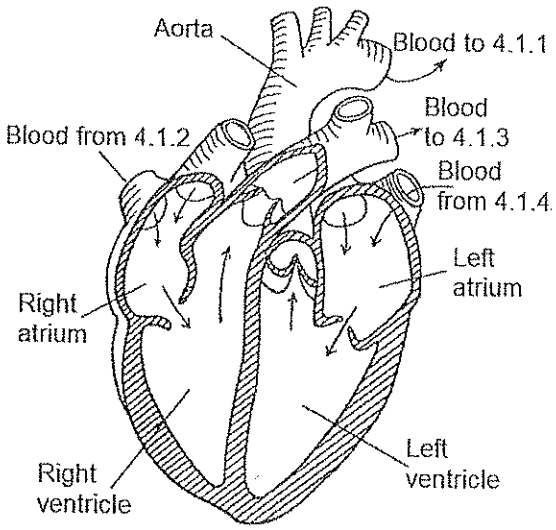
Part of meal	Nutrient
E.g. Bread roll	

(6)

[20]

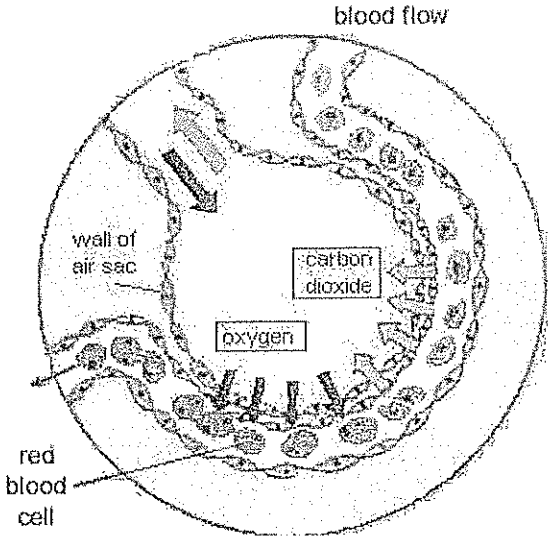
Question 4

4.1 Look carefully at the diagram of the heart below. For each of 4.1.1. to 4.1.4, state where the blood is going to or coming from. Write only the question number and the answer.



(4)

4.2 Look carefully at the diagram of gaseous exchange in the alveoli below. Use keywords from the diagram to give a step by step description of the process of gaseous exchange.



(6)

4.3 Respiration takes place in the mitochondria of all body cells. The mitochondria use "fuels" provided by the body to produce energy.

4.3.1 What are the two "fuels" that cells need to produce energy? (2)

4.3.2 Which body systems provide each of these "fuels" you named in 4.3.1? (2)

4.3.3 When energy is produced in the cell, what are the two waste products? (2)

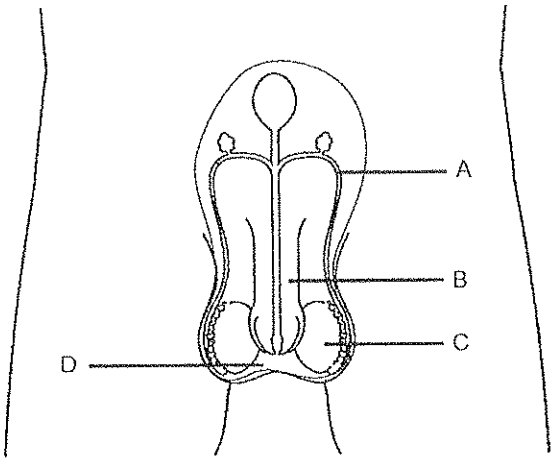
4.3.4 How are these two waste products removed from the body? (2)

4.3.5 Name two body processes that are fuelled by the energy produced. (2)

[20]

Question 5

5.1 Look at the diagram of the male reproductive system below. Provide labels for the parts labelled A – D. Write the letters A – D and then the name of each part.



(4)

Question 8

NaF	FeO_3	$CaCl_2$
A	B	C

8.1 Give the **NAME** of the elements which combined to form:

8.1.1 Compound A (2)

8.1.2 Compound B (2)

8.1.3 Compound C (2)

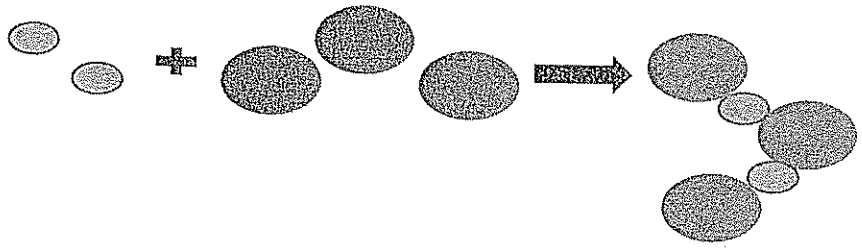
8.2 Give the **NAME** of:

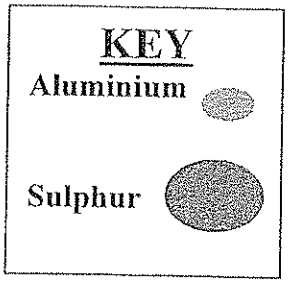
8.2.1 Compound A (2)

8.2.2 Compound B (2)

8.2.3 Compound C (2)

8.3





For the above models of reaction:

8.3.1 Write down the balanced chemical equation for the reaction. (3)

8.3.2 Write down the word equation for the reaction. (3)

8.4 Look at the chemical equation below and complete the sentences below by filling in the missing words. Write only the number and the correct word in your answer book.

$$4Na + O_2 \rightarrow 2Na_2O$$

The subscript number indicates the number of __8.4.1__ of an element found in the formula. There are __8.4.2__ oxygen atoms joined together in one __8.4.3__ . The numbers in front of the compounds indicate the __8.4.4__ in which the molecules react. __8.4.5__ sodium atoms react with __8.4.6__ oxygen molecule to form two sodium oxides.

8.5 Rewrite and complete the following chemical equations and balance them:

8.5.1 $Ca + O_2 \rightarrow$ (2)

8.5.2 $N_2 +$ _____ $\rightarrow NH_3$ (2)

[28]

Question 9

9.1 What is meant by the term pH? (2)

9.2 Look at the table below and answer the questions that follow:

SUBSTANCE	pH
Bleach	9
Lime juice	2
Milk of magnesia	10
Water	7
Black coffee	5
Dishwashing detergent	12
Milk	6

9.2.1 Which substance is the strongest acid? (1)

9.2.2 Which substance is neutral? (1)

9.2.3 What colour change will be seen if litmus paper is placed in dishwashing detergent? (2)

9.2.4 What colour change will be seen if bromothymol blue is placed in milk? (2)

9.2.5 Explain why it is not a good idea to treat indigestion by drinking milk.

From the substances in the table above what would you suggest a person uses to treat indigestion? (3)

9.2.6 What is the name for the type of reaction which takes places between an acid and a base? (1)

[12]

THE PERIODIC TABLE OF ELEMENTS