

**HILLCREST HIGH SCHOOL**  
**NATURAL SCIENCE**  
**GRADE 9**



**JUNE 2016**

**TIME: 2 HRS**

**EXAMINER: MRS GROBLER**

**MODERATORS: MR SIBIYA, MR MAHABEER**

**TOTAL 120**

Instructions

1. Answer ALL the questions.
  2. This question paper consists of FOUR sections:
  3. SECTION A (20)  
SECTION B (50)  
SECTION C (10)  
SECTION D (40)
  4. Answer SECTIONS A to D in the ANSWER BOOK.
  5. Non-programmable calculators may be used.
  6. Appropriate mathematical instruments may be used.
  7. Number the answers correctly according to the numbering system used in this question paper.
  8. A periodic table is attached for your use.
  9. Give brief motivations, discussions, et cetera where required.
- Numbers must be rounded off to **two decimal** places

**SECTION A: LIFE AND LIVING****QUESTION 1: MULTIPLE CHOICE QUESTIONS**

Four options are provided as possible answers to the following questions. Each question has only one correct answer. Write only the letter (A-D) next to the question number (1.1-1.10) in the answer book.

- 1.1 The rotating nosepiece in a microscope...
- A. Is used to locate the object being observed
  - B. Controls the amount of light passing through the specimen
  - C. Hold objectives with low and high power lenses
  - D. Focuses light rays onto the object
- 1.2 In which part of the alimentary canal is the most digested food absorbed?
- A. Colon
  - B. Mouth
  - C. Stomach
  - D. Small intestine
- 1.3 Which of the following is **not** part of the respiratory system?
- A. Heart
  - B. Lungs
  - C. Intercostals
  - D. Air passages
- 1.4 The pathway along which sperm cells move, is:
- A. Sperm duct → urethra → ureter
  - B. Testis → sperm duct → urethra
  - C. Ureter → urinary bladder → urethra
  - D. Testis → Sperm duct → prostate gland
- 1.5 The body cells of humans are in close contact with:
- A. Veins
  - B. Capillaries
  - C. Arteries
  - D. Heart

- 1.6 The outermost part of an animal cell is the...
- A. Vacuole
  - B. Nucleus
  - C. Cell wall
  - D. Cell membrane
- 1.7 Which of the following does **not** form part of the alimentary canal?
- A. Pancreas
  - B. Stomach
  - C. Rectum
  - D. Colon
- 1.8 The mechanism of taking oxygen from the external atmosphere into the lungs is called:
- A. Exhalation
  - B. Gaseous exchange
  - C. Inhalation
  - D. Cellular respiration
- 1.9 Fertilisation in humans normally occurs when the ovum is in the...
- A. Oviduct
  - B. Uterus
  - C. Vagina
  - D. Ovary
- 1.10 Which of the following constituents of blood is responsible for killing foreign cells?
- A. Blood platelets
  - B. Blood plasma
  - C. Red blood cells
  - D. White blood cells

[10]

## QUESTION 2: TERMINOLOGY

Give one word or term that best describes the following statements:

- 2.1 The material found in cells that carry the hereditary information of all organisms.
- 2.2 The structure found at the base of the brain that is responsible for making hormones.
- 2.3 Blood that is rich in carbon dioxide.
- 2.4 A condition where a person has more than five bowel movements or watery stools per day.
- 2.5 The muscular plate that divides the thorax (chest) from the abdomen. [5]

### QUESTION 3: TRUE OR FALSE STATEMENTS

Identify which of the following statements is true en which is false. You only need to write down TRUE or FALSE next to the question number on your answer sheet.

- 3.1 A human embryo is classified as a fetus after **six weeks** of development.
- 3.2 Chemical digestion is the breakdown of food by crushing and mashing the food.
- 3.3 Ulcers are sores in the lining of the mouth and intestines.
- 3.4 The atrium is the heart chamber which receives blood.
- 3.5 Vacuoles are **only** found in plant cells.

[5]

TOTAL SECTION A: [20]

### SECTION B

#### INSTRUCTIONS

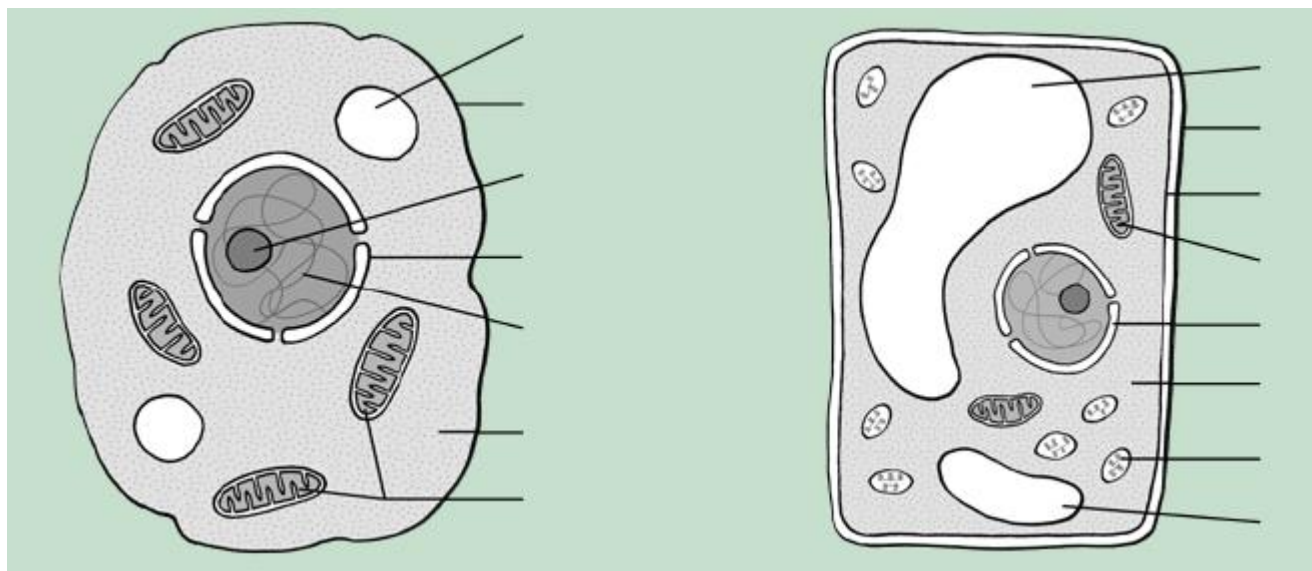
1. Leave one line between two sub questions, for example between QUESTION 4.1 and QUESTION 4.2.
2. ALL biological drawing rules apply for this section.
3. Carefully follow all instruction given when answering the questions.

### QUESTION 4

Study the diagrams below and answer the questions that follow:

CELL 1

CELL 2



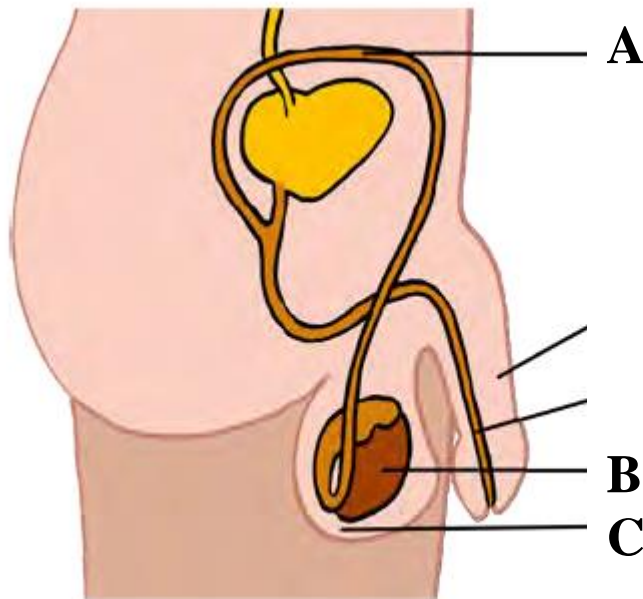
- 4.1 Write down an appropriate heading for the diagram labeled CELL 2. (1)
- 4.2 Write down the name of a cell structures that CELL 1 and CELL 2 have in common. (1)
- 4.3 What is the name of the apparatus that could be used to view these two cells? (1)
- 4.4 Write down the name of the organelle where cellular respiration takes place. (1)
- 4.5 What is the name given to the green pigment found in plant cells? Also explain its function. (2)
- 4.6 What is the function of the nuclear membrane? (1)
- 4.7 Complete the following paragraph by writing down the missing words on your answer sheet. Only write down the missing word next to the question number.

All living organisms are made up of 4.7.1. A group of cells that all have the same structure and perform the same function is called a/an 4.7.2. A 4.7.3 consists of a group of different organs that work together to perform a bodily function for an organism. (3)

**[10]**

### QUESTION 5

Study the diagram of the MALE REPRODUCTIVE SYSTEM below and answer the questions that follow.



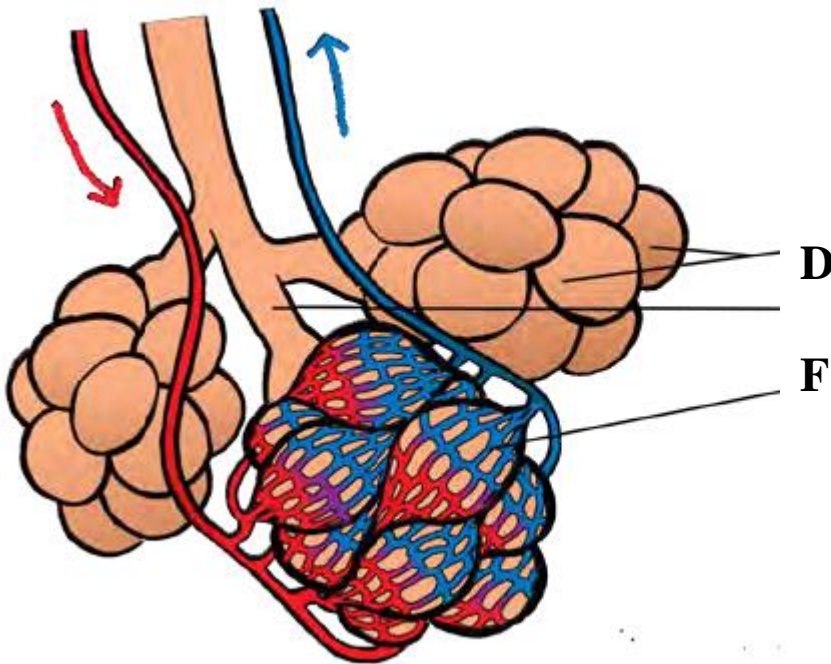
- 5.1 Identify the part labeled A. (1)
- 5.2 Name two substances that are produced by the part labeled B? (2)
- 5.3 Write down the main function for the part labeled C. (1)

Question 5.4 - 5.6 are related to the female reproductive system.

- 5.4 Write down the two functions of the female reproductive system. (2)
- 5.5 Define the following terms:
- 5.5.1 Ovulation (1)
- 5.5.1 Menstruation (1)
- 5.6 Draw a neatly labeled diagram of the **frontal view** of the female reproductive system. (5)
- 5.7 Name any two methods of contraception. (2)
- [15]**

### QUESTION 6

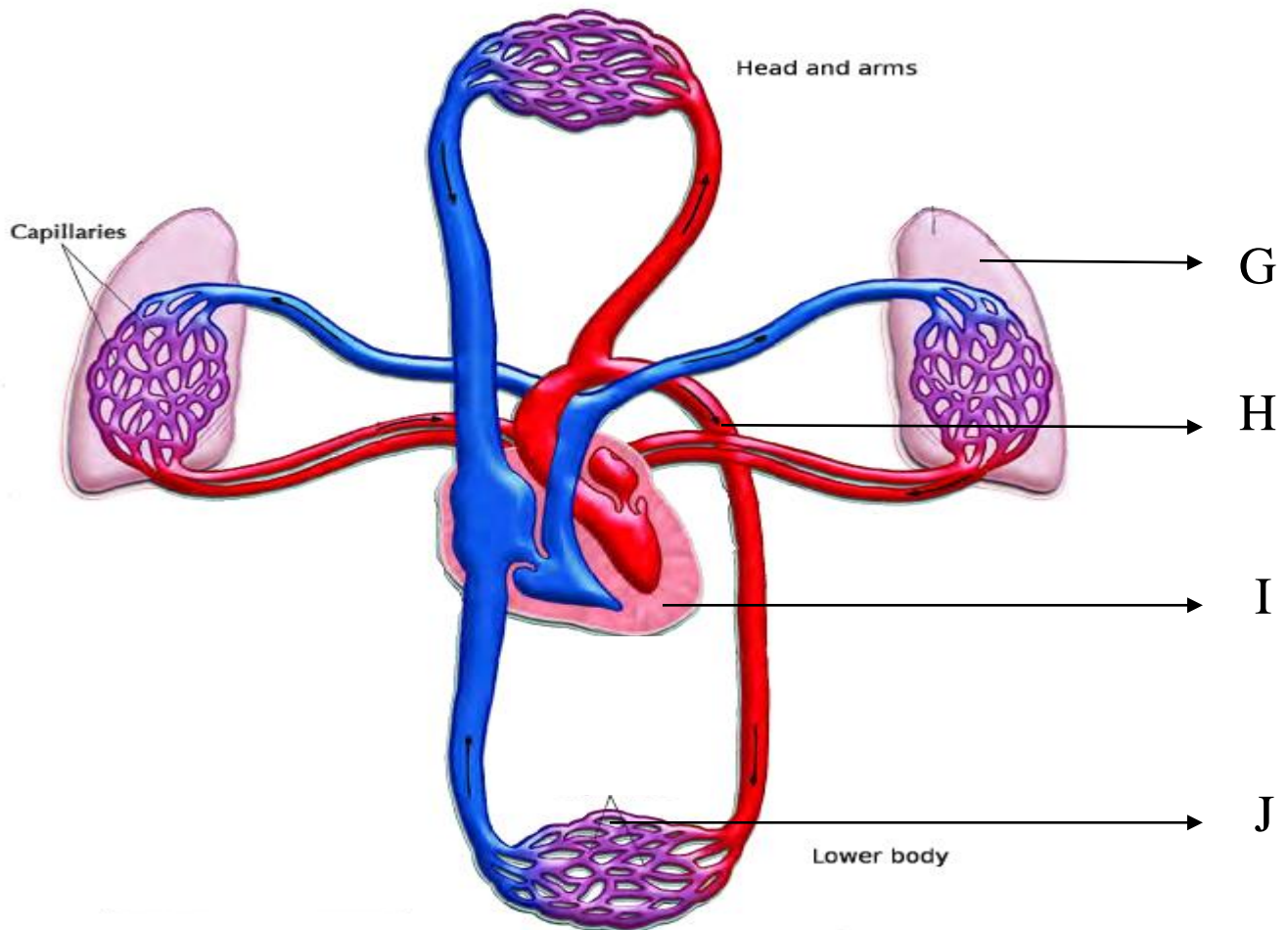
The diagram below forms part of the respiratory system. Study the diagram and answer the questions that follow.



- 6.1 Inside which organ of the human body would you find the structure above? (1)
- 6.2 Name the process that takes place inside the cells at the part labeled D. (1)
- 6.3 Draw a neatly labeled diagram to illustrate the exchange of gases that takes place inside the part labeled D. (6)
- 6.4 Identify the part labeled F. (1)
- [9]**

### QUESTION 7

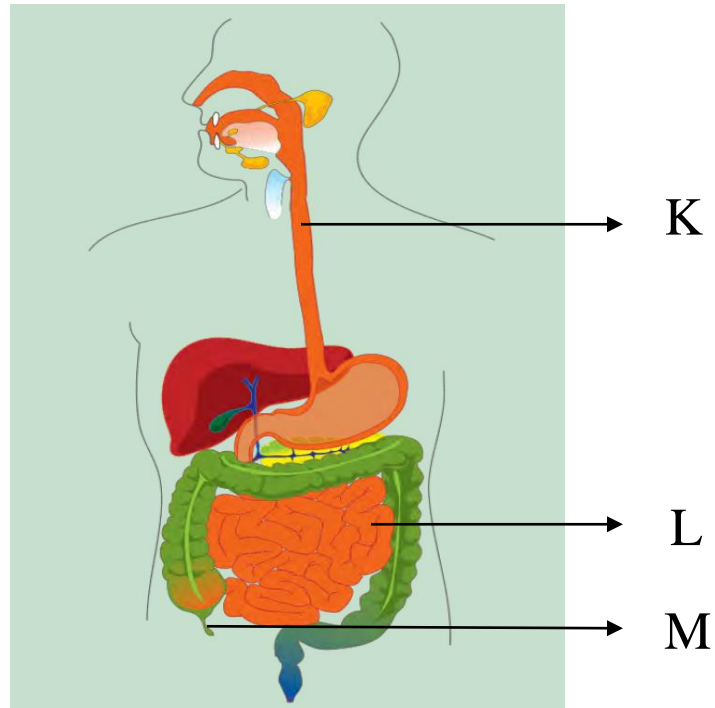
Study the diagram below and answer the questions.



- 7.1 Write down the name of the part labeled G. (1)
- 7.2 Give the general name of the blood vessel illustrated by the part labeled H. (1)
- 7.3 Write down the function of the part labeled I. (2)
- 7.4 Write down the name of the process that takes place inside the cells at the part labeled J. (1)
- 7.5 Write down the chemical equation for the process that takes place at part J. (5)
- [10]**

**QUESTION 8**

Study the diagram below and answer the questions that follow.



- 8.1 Name the system that is illustrated in the above diagram. (1)
- 8.2 Give (i) the name of the part labeled K and (ii) write down the name of the process that pushes the food toward the next part of the alimentary canal. (2)
- 8.3 Write down the process occurring at the part labeled L. (1)
- 8.4 Give the name of the part labeled M. (1)
- 8.5 Define the term 'egestion'. (1)
- [6]**

**TOTAL SECTION B = 50**

**TOTAL SECTION A & SECTION B = 70**

**SECTION C: MATTER AND MATERIALS****INSTRUCTIONS**

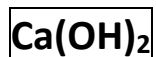
1. Start this section on a new page.

**QUESTION 9: MULTIPLE CHOICE QUESTIONS**

Four options are provided as possible answers to the following questions. Each question has only one correct answer. Write only the letter (A-D) next to the question number (9.1-9.10) in the answer book.

- 9.1 A pure substance that is made up of only one type of atom that cannot be split up into simpler substances.
- A. Compound
  - B. Element
  - C. Molecule
  - D. Rock
- 9.2 The name of the element found in group 3, period 2 on the periodic table of elements is:
- A. Scandium
  - B. Aluminium
  - C. Boron
  - D. Fluorine
- 9.3 The atomic number for the element found in group 7, period 4 is:
- A. 35
  - B. 80
  - C. 43
  - D. 98

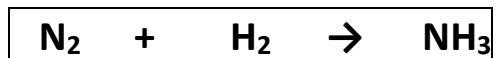
9.4



The name of the above compound is:

- A. Calcium dihydroxide
- B. Calcium (II) hydrogen oxide
- C. Calcium peroxide
- D. Calcium hydroxide

9.5



The correct balancing numbers for the chemical reaction above is:

- A. 2, 3, 2
- B. 1, 3, 2
- C. 1, 3, 3
- D. 2, 6, 4

9.6

The process of covering steel or iron with a layer of a more reactive metal such as Zinc is known as:

- A. Rusting
- B. Electroplating
- C. Oxidation
- D. Galvanising

9.7

A compound that forms when a metal burns in oxygen...

- A. Metal oxide
- B. Metal hydroxide
- C. Non-metal oxide
- D. Non-metal hydroxide

9.8

A substance with a pH between 1 and 7 is:

- A. Acidic
- B. Basic
- C. Alkali
- D. Neutral

9.9 An example of a natural indicator:

- A. Leather
- B. Red cabbage
- C. White onions
- D. Peaches

9.10 An example of a weak acid:

- A. Vinegar
- B. Sunlight liquid
- C. Oven cleaner
- D. Handy Andy

**TOTAL SECTION C =[10]**

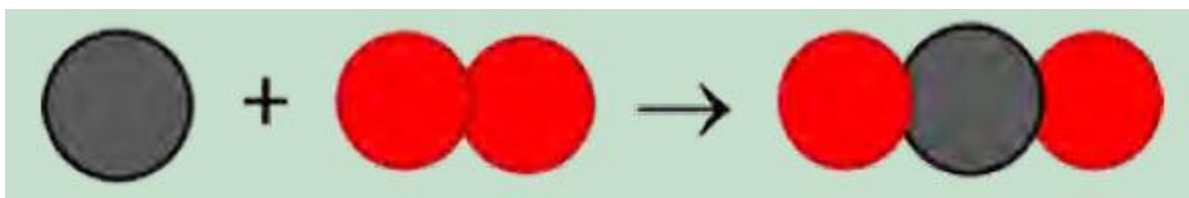
## SECTION D

### INSTRUCTIONS

1. Leave ONE line between two sub questions, for example between QUESTION 10.1 and QUESTION 10.2.

### QUESTION 10

The following diagram shows how carbon and oxygen react to form carbon dioxide:



- 10.1 Write down the chemical reaction (in symbol form) that is represented above. (3)
- 10.2 Explain why the oxygen is represented as two circles together. (1)
- 10.3 Magnesium chloride has the formula  $\text{MgCl}_2$ . What does this ratio tell us about the atoms in the compound? (2)
- 10.4 Write down the chemical formula for the compound that forms between Lithium and sulphur. (1)
- 10.5 Re-write and balance the following chemical reactions:
  - 10.5.1  $\text{CaCO}_3 + \text{HCl} \rightarrow \text{CaCl}_2 + \text{CO}_2 + \text{H}_2\text{O}$  (1)
  - 10.5.2  $\text{Be} + \text{F}_2 \rightarrow \text{BeF}_2$  (1)
  - 10.5.3  $\text{C} + \text{H}_2 \rightarrow \text{CH}_4$  (1)

**[10]**

**QUESTION 11**


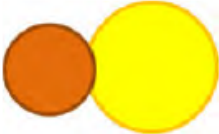

The following information is available for an element:



- 11.1 Write down the name of the element represented above. (1)  
 11.2 How many protons does this element have in its nucleus? (1)  
 11.3 Write down the atomic mass number for the element. (1)  
 11.4 Calculate how many neutrons the element will have in its nucleus. Show all calculations. (3)  
 11.5 What is the name of the group in which this element is found? (1)  
 11.6 Draw the atomic structure for this element. Label all the subatomic particles. (3)
- [10]**

**QUESTION 12**

Redraw and complete the table below on your answer sheet. Only complete the parts next to the question numbers from 12.1 to 12.4.

Formula	Consists of	Name	Picture of one formula unit of the compound
Example: NaCl	Sodium and chlorine	Sodium chloride	
FeS	Iron and sulfur	12.1 (1)	
MgO	12.2 (2)	Magnesium oxide	12.3 (1)
12.4 (1)	Lithium and fluorine	Lithium fluoride	

[5]

**QUESTION 13**

Complete the following sentences by filling in the missing words. Only write the word down next to the question number on your answer sheet.

- 13.1 To know if something is an acid or a base, we measure its \_\_\_\_\_. (1)
- 13.2 The formula for the laboratory acid name nitric acid is \_\_\_\_\_. (1)
- 13.3 When a metal oxide reacts with a /an \_\_\_\_\_, a metal salt and water is formed. (1)
- 13.4 When a metal carbonate reacts with an acid, a metal salt, 13.4.1 and 13.4.2 is formed. (2)
- 13.5 Metal oxides and metal hydroxides dissolve in water to form 13.5.1 solutions. This means that the solutions will have pH values 13.5.2 higher/lower (choose the correct answer) than seven. (2)
- 13.6 The reaction between an acid and a base is called a \_\_\_\_\_ reaction. (1)
- 13.7 Bases are generally 13.7.1 in color and 13.7.2 solids/liquids/gases (choose the correct answer) at room temperature. (2)
- [10]**

**QUESTION 14**

Re-write the following word equation into the symbol equation and balance the reaction.

- 14.1 Potassium reacts with hydrogen nitrate to form potassium nitrate and hydrogen. [5]

**TOTAL SECTION D: [40]**

**TOTAL SECTION C & SECTION D = 50**

**GRAND TOTAL = 120**

