<table>
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<tr>
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HERZLIA MIDDLE SCHOOL

GRADE 9
NATURAL SCIENCE MID-YEAR EXAMINATION
4 June 2015
TIME: 90 Minutes
MARKS: 170
SECTION A: SHORT QUESTIONS
(LIFE & LIVING and MATTER & MATERIALS)

INSTRUCTIONS

1. There are 26 pages including a cover page and a Periodic Table. Make sure you have all of them.

2. Answer all questions on the paper in blue or black ink.

3. Read each question carefully before answering it.

4. Pay attention to the mark allocation.

5. Plan your time carefully.

6. All the diagrams should be done in pencil and labelled in blue or black ink.

7. Write neatly and legibly.

8. Write in full sentences. No one word answer will be accepted.

9. You may use the small Periodic Table that you have been given by your Science teacher.
# MULTIPLE CHOICE ANSWER SHEET

**NAME:**

**Class:**

Multiple Choice (use pencil only)

Choose the answer, which you consider most appropriate and cross the corresponding letter on this Answer Sheet.

*Example:* If your answer to 1.3 is D, indicate your choice like this:

<table>
<thead>
<tr>
<th>1.3</th>
<th>A</th>
<th>B</th>
<th>C</th>
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If more than one cross appears in any line, the answer will be marked wrong.

<table>
<thead>
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QUESTION 1  MULTIPLE CHOICE

Four options are provided as possible answers to the following questions. Each question has only ONE correct answer. Circle the letter of the correct answer.

1.1 The symbol for sodium is.. (2)
A  So
B  S
C  K
D  Na

1.2 How many different types of elements are present in the compound ammonium nitrate? (2)
A  2
B  3
C  4
D  5

1.3 The name of the compound FeS is… (2)
A  Iron sulfate
B  Iron (I)sulfide
C  Iron (II) sulfide
D  Iron (II) sulfate

1.4 The element which has 12 neutrons is … (2)
A  Carbon
B  Copper
C  Magnesium
D  Nitrogen
1.5 In a neutral atom the number of protons is equal to … (2)
   A number of electrons
   B mass number
   C number of orbits
   D number of electron shells

1.6 How many neutrons does the following element have? (2)

\[
\begin{array}{c}
\text{11} \\
\text{23} \\
\text{Na}
\end{array}
\]
   A 11
   B 23
   C 12
   D 10

1.7 The name given to gases that are unreactive is… (2)
   A Common gases
   B Noble gases
   C Alkaline elements
   D Transitional elements

1.8 What causes an atom to become an ion? (2)
   A When the atomic number is equal to mass number.
   B When the atomic number is equal to the number of protons.
   C When the atomic number is more than mass number.
   D When the atomic number is more or less than number of electrons.
1.9 The electrons that are responsible for the chemical reaction that takes place when forming ionic compounds and give atoms the ability to combine is the…

A Valency number
B Ionic number
C Atomic number
D Mass number

1.10 Give another name for an ionic bond:

A Covalent bond
B Electrovalent bond
C Compound bond
D Atomic bond

1.11 The organelle of the cell that produces energy:

A mitochondria
B chloroplast
C vacuole
D nucleus

1.12 The part(s) of the plant cell which surrounds the contents of the cell is called the…

A nucleus
B cytoplasm
C cell membrane
D cell wall and cell membrane
1.13 Which of the following structures were not seen in the onion cell that you viewed through a light microscope?

A chloroplast  
B cell wall  
C cytoplasm  
D nucleus

1.14 Which part of the male gamete contains more mitochondria?

A middle piece  
B head  
C tail  
D the nucleus

1.15 A cell biologist compared the cell contents of two types of cells. Which statement is true for Cell 1 and Cell 2?

[Graph showing cell contents of Cell 1 and Cell 2]

A Cell 1 is a plant cell and Cell 2 is an onion cell  
B Cell 1 and Cell 2 are both plant cells.  
C Cell 1 is a plant cell and Cell 2 is an animal cell.  
D Cell 1 is a plant cell and Cell 2 is a relatively inactive animal cell.
1.16 The part labelled X is the …
   A chloroplast
   B mitochondria
   C vacuole
   D cytoplasm

1.17 Nina used a microscope which magnified an object x60. If a x10 eyepiece is used, what is the power of the objective lens used?
   A 60x
   B 600x
   C 6x
   D 70x

1.18 Which equation represents the process of respiration?
   A carbon dioxide + water + energy → food + oxygen
   B carbon dioxide + water → food + oxygen + energy
   C food + oxygen → carbon dioxide + water + energy
   D food + oxygen + energy → carbon dioxide + water

1.19 The correct sequence from the simplest to the most complex is:
   A organ → organism → tissue → system
   B tissue → organ → system → organism
   C system → tissue → organism → organ
   D organ → tissue → system → organism
1.20 Which structures are found in a generalised human cell? (2)

i) nucleus
ii) cytoplasm
iii) mitochondria
iv) cell membrane

A  i) only
B  i), ii) and iv)
C  i), ii), iii) and iv)
D  i) and ii)

Refer to the following photograph for questions 1.21 – 1.26.

1.21 Label X on the microscope points to the… (2)

A  tube
B  objective
C  lens
D  eyepiece or ocular
1.22 The part labelled Z on the microscope is the…
   A condenser
   B diaphragm
   C revolving nosepiece
   D objective lens

1.23 The function of the part labelled Y on the microscope is to…
   A control the amount of light
   B control the quality of light
   C finely focus the image
   D move the stage

1.24 The part labelled Y on the microscope is the…
   A lens
   B ocular
   C fine adjustment screw
   D medium power objective

1.25 The function of carbohydrates to our bodies is for…
   A growth
   B energy
   C building muscles
   D insulation

1.26 Weak immune system may be a result of ________________ deficiency.
   A Vitamin A
   B Vitamin B
   C Vitamin C
   D Vitamin D
1.27 Which substance is used to test whether a food contains starch?  
A   chlorine  
B   iodine  
C   ethanol  
D   water  

1.28 Where does implantation of a human embryo usually occur?  
A   cervix  
B   ovary  
C   oviduct  
D   uterus  

1.29 The hormone (s) that is/are responsible for the development of the male secondary sexual characteristics in puberty is called..  
A   oestrogen  
B   testosterone  
C   progesterone  
D   testosterone and oestrogen  

1.30 Mandy started her period on 7 January. She has a regular cycle of 28 days and menstruates for 6 days. On what day of January is Mandy likely to ovulate?  
A   12 January  
B   6 January  
C   20 January  
D   28 January
QUESTION 2  ONE WORD ANSWER

Give ONE word/term for each of the following descriptions. Write only the word/term on the line below the statement. Do not give examples.

2.1 A sex cell

2.2 The release of semen from the penis

2.3 The release of a ripe egg from the ovary

2.4 The breaking down and shedding of the lining of the uterus from the vagina

2.5 The joining of the egg and sperm to form a single cell

2.6 Representation of a compound with symbols

2.7 A row in the Periodic Table.

2.8 The movement of electrons around the nucleus

2.9 The same element that can have different valency numbers.

2.10 A charged compound

(10x 1)=10
Choose a word or phrase from COLUMN B that matches a word or phrase in COLUMN A. Write only the letter (A – E) next to the question number (3.1 – 3.5).

<table>
<thead>
<tr>
<th>COLUMN A</th>
<th>COLUMN B</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1….. Unreactive</td>
<td>A Burning</td>
</tr>
<tr>
<td>3.2….. White flame</td>
<td>B Helium</td>
</tr>
<tr>
<td>3.3….. Combustion</td>
<td>C Zinc</td>
</tr>
<tr>
<td>3.4….. Oxygen</td>
<td>D Sodium</td>
</tr>
<tr>
<td>3.5….. Bright yellow flame</td>
<td>E Odourless</td>
</tr>
</tbody>
</table>

(5X1=5)
SECTION B: CHEMISTRY

QUESTION 1: Chemical Reactions

1.1 Balance the following chemical equations

1.1.1 Pb(OH)$_2$ + HCl $\rightarrow$ PbCl$_2$ + H$_2$O

1.1.2 CaCO$_3$ + HCl $\rightarrow$ CaCl$_2$ + CO$_2$ + H$_2$O

1.1.3 C$_3$H$_8$ + O$_2$ $\rightarrow$ CO$_2$ + H$_2$O
1.2 Write down the word (sentence) equations below as chemical equations and balance them.

1.2.1 Potassium metal and chlorine gas react to form potassium chloride.

\[ \text{K} + \text{Cl}_2 \rightarrow \text{KCl} \]  

(5)

1.2.2 Aluminum and hydrogen chloride react to form aluminum chloride and hydrogen gas.

\[ \text{Al} + 3\text{HCl} \rightarrow \text{AlCl}_3 + 3\text{H}_2 \]  

(8)

1.2.3 Calcium carbonate react with hydrogen chloride to form calcium chloride, water and carbon dioxide.

\[ \text{CaCO}_3 + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2 \]  

(6)
1.3 Draw the Bohr diagrams for the following elements. The diagram must include the proton number, neutron number & electron configuration of the atom or ion.

1.3.1 Beryllium ion (4)

1.3.2 Carbon (4)

1.3.3 Fluorine ion (4)
QUESTION 2: FORMULAE

Write the formulae of the following compounds and show your working.

2.1 Sodium hydrogen carbonate

2.2 Iron (II) chloride

2.3 Aluminium hydroxide
SECTION C: CELL & MICROSCOPE; NATURAL SELECTION & REPRODUCTION

QUESTION 1: Natural Selection

1.1 The diagram below shows two forms of the same species of moth. One form is dark coloured and one is light coloured. You are not able to see the dark coloured moth as it is camouflaged against the bark of the tree. The tree is black due to the pollution in the city. The light colored lichens found on the surface of the trees have been died due to the pollution.

![Diagram of moth and tree]

Some scientists conducted an investigation on this moth in England during the mid-19th century. Equal numbers of both forms of moths were set free in a small park near the centre of a town. The numbers of each form of moth caught in traps were counted each day.

<table>
<thead>
<tr>
<th>Day</th>
<th>Number of dark moths</th>
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<tbody>
<tr>
<td>1</td>
<td>20</td>
<td>20</td>
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<td>2</td>
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<td>6</td>
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</table>

1.1.1 Compare the results of the dark and light moths from days one to six. (4)
1.1.2 What results would you expect if equal numbers of the two forms of the moth were released in an open countryside a long way from towns and cities? (1)


2.1 Examine the diagram below and answer the questions which follow:

2.1.1 Provide labels in the spaces above. (4)

2.1.2 This is a plant cell. Give two reasons from the diagram that provides evidence for this statement. (2)

2.1.3 Give one function of each of the parts labelled:
   B:

   C:

2.1.3 Give two similarities between plant and animal cells. (2)
2.2  Look at the diagram of cells which Richard in 9C examined under the microscope.

2.2.1  Name the cells

2.2.2  Name the stain that Richard used to make the cells visible.

2.2.3.1  Name the part labelled P

2.2.3.2  Give the function of the part labelled P.
QUESTION 3: Reproduction

3.1 Look at the diagram of the female reproductive system.

A ____________________  
B ____________________  
C ____________________  
D ____________________  
E ____________________  
F ____________________

3.1.1 Provide labels in the spaces above. (6)

3.1.2 Where on the diagram do each of the following take place? Write the letter from the diagram only. (4)

3.1.2.1 the release of the egg:

3.1.2.2 fertilization:

3.1.2.3 implantation:

3.1.2.4 area where the penis is inserted during intercourse:

3.1.3 What happens to the lining of the uterus: (2)

(i) before the release of an egg?

(ii) if no fertilization occurs?
3.2 Use the diagram below to describe the journey of a sperm cell from the point where it is made to when it leaves the man’s body. Ensure that you use the names of the parts labelled A – E in your explanation. Give the letter in brackets behind the words when you use them in the explanation.
3.3 Read the article and answer the questions.

**Government plans to give condoms to 10-year-olds**

2015-05-10

School children as young as 10 could be offered condoms as part of a government move to teach sex education in schools.

The proposals, gazetted this week, involve offering male and female pupils condoms from grades 7-12. Younger children in grades 4-6, who would be aged nine to 12, would be given condoms "where required".

There would also be mandatory sex education for primary and high school pupils.

Mobile clinics will visit schools so that teachers and pupils can be tested voluntarily for HIV, sexually transmitted diseases and TB.

Grade 6 children were on their "radar" for the offering of condoms because figures had shown younger girls were falling pregnant. Earlier this year, parliament was told 717 primary school pupils and 20116 high school pupils had fallen pregnant last year.

Condoms would be offered to younger pupils if the children were mature for their age. They would not just be dished out to everyone, he said. "It will be done in a dignified and private manner."

However, Stanley Makhitha, a child-rights activist, said one of the consequences of offering condoms to pupils was that children who were not sexually active "might be tempted to do so".


2.2.1 Give an argument to support the government giving condoms to children as young as 10 years old.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
2.2.2 Give an argument **against** the government giving condoms to children as young as 10 years old.  

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

2.2.3 Give your opinion on the government giving condoms to children as young as 10 years old  

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
## Periodic Table of Elements

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<th>Period</th>
<th>Group 1</th>
<th>Group 2</th>
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