<table>
<thead>
<tr>
<th>NAME</th>
<th>TEACHER’S COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>TEACHER</td>
<td></td>
</tr>
<tr>
<td>CLASS</td>
<td></td>
</tr>
<tr>
<td>MARK</td>
<td></td>
</tr>
<tr>
<td>PERCENTAGE</td>
<td></td>
</tr>
</tbody>
</table>

HERZLIA MIDDLE SCHOOL

NATURAL SCIENCES

GRADE 9

END OF YEAR EXAMINATION

PAPER 1 - BIOLOGY

19 NOVEMBER 2015

TIME: 60 Minutes

MARKS: 100
INSTRUCTIONS:

1. This paper consists of 13 pages. Check that you have them all.
2. Answer all the questions.
3. All diagrams and graphs should be done in pencil and labelled in ink.
4. Read each question carefully before answering it and pay attention to the mark allocation.
5. Write neatly and legibly.
6. After completing the examination, remove the front cover page and staple your answers between the front cover page and page 2.
SECTION A: SHORT QUESTIONS

QUESTION 1: MULTIPLE CHOICES

Various possibilities are given as answers to the following questions. Indicate the correct answer by writing only the appropriate letter for the correct question number. E.g. 1.1 A. [20]

1.1 A large structure found in cytoplasm that performs a specific function (2)

A organ  
B cell  
C organelle  
D tissue

1.2 The most important and distinguishing difference between cell A and B can be related to the parts labelled (2)

A 1, 2 and 4  
B 2, 3 and 8  
C 2, 8 and 17  
D 8 and 9

1.3 The nucleus of a cell (2)

A is the region of the cell where photosynthesis takes place  
B contains DNA and controls cell activities  
C provides a liquid medium for chemical reactions  
D is responsible for releasing energy from glucose

1.4 A substance used to indicate the presence of carbon dioxide is (2)

A limewater  
B iodine solution  
C carbon monoxide  
D there is no such substance
Question 1.5 is based on the schematic representation below of part of the human breathing system.

1.5 Which of the following is the correct sequence of air passages through which inhaled air flows until it reaches the air sacs in the lungs? (2)

A  3  5  4  2  1
B  3  5  4  1  2
C  3  4  5  1  2
D  3  4  5  2  1

1.6 Which of the following describes the term “breathing” most accurately? (2)

A  the transport of carbon dioxide and oxygen in the blood.
B  the process by which energy is formed in cells
C  the process of inhalation and exhalation
D  the exchange of carbon dioxide and oxygen in the alveoli

1.7 Which body system is responsible for receiving impulses and responding to stimuli? (2)
1.8 The function of the scrotum is to
   A control the temperature at which sperm occurs
   B act as storage space for mature sperm cells
   C produce testosterone
   D release fluids that contain food for the sperm

1.9 In Fig. 1 alongside, blood that enters part G
   A is deoxygenated
   B is oxygenated
   C has come from part D
   D will pass into blood vessel H

1.10 Ovulation can be described as
   A the series of changes that happen in the female reproductive system
   B the shedding of the uterus lining which results in bleeding
   C the follicle bursting open to release an ovum into the oviduct
   D egg and sperm brought together during intercourse
QUESTION 2: TERMINOLOGY

Write the correct biological term for each of the following statements. [6]

2.1 The stage in the human life cycle when sexual organs mature for reproduction.
2.2 Movement of molecules from an area of high concentration to an area of lower concentration.
2.3 The organelle in a cell responsible for respiration.
2.4 The heart chamber that receives deoxygenated blood from the body.
2.5 The part of the female reproductive system that carries the ovum from the ovary to the uterus.
2.6 The component of blood that is a yellow liquid containing blood cells, salts, digested foods and such.

MATCHING COLUMNS

QUESTION 3

Match the letter in Column B to the correct statement in Column A. Write only the correct letter. [6]

<table>
<thead>
<tr>
<th>COLUMN A</th>
<th>COLUMN B</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Pigment that absorbs light energy from the sun</td>
</tr>
<tr>
<td>3.2</td>
<td>Cells that are not specialised and can develop into any other type of cell</td>
</tr>
<tr>
<td>3.3</td>
<td>Tube that conducts urine to the outside of the body</td>
</tr>
<tr>
<td>3.4</td>
<td>Pigment that carries oxygen in red blood cells</td>
</tr>
<tr>
<td>3.5</td>
<td>Cells that have the ability to join during fertilisation to form a new individual</td>
</tr>
<tr>
<td>3.6</td>
<td>Organ responsible for filtering the blood</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
QUESTION 4

Each of the following questions consists of a statement in the first column and two items (A and B) in the second column. Decide which of the following options below relates best to the statement.

A  if only item A relates to the statement

B  If only item B relates to the statement

A and B  If both items, A and B relate to the statement

NONE  If neither of the items relate to the statement

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>ITEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Blood vessels that carry blood to the heart</td>
<td>A arteries</td>
</tr>
<tr>
<td></td>
<td>B veins</td>
</tr>
<tr>
<td>4.2 Process in which soluble nutrients are taken up by the blood stream</td>
<td>A ingestion</td>
</tr>
<tr>
<td></td>
<td>B digestion</td>
</tr>
<tr>
<td>4.3 Components of the skeletal system that join bone to bone</td>
<td>A ligaments</td>
</tr>
<tr>
<td></td>
<td>B tendons</td>
</tr>
<tr>
<td>4.4 Consists of one layer of cells</td>
<td>A alveolus</td>
</tr>
<tr>
<td></td>
<td>B capillary</td>
</tr>
</tbody>
</table>

[SECTION A TOTAL: 40]
SECTION B: LONG QUESTIONS

QUESTION 1: CIRCULATORY SYSTEM

1.1 Study the diagram of the internal structure of the heart and answer the questions.

1.1.1 Identify the parts numbered 2 and 9.  (2)

1.1.2 Is the blood in part numbered 2 oxygenated or deoxygenated?  (1)

1.1.3 Parts numbered 5, 6, 11 and 13 are valves. What is the function of a valve?  (2)

1.1.4 Explain why the ventricle walls of the left side of the heart are much thicker than the right ventricular walls of the heart.  (2)
1.2 Examine the micrograph of a section through an artery and a vein shown below and answer the questions that follow.

[Source: http://www.columbia.edu/itc/hs/medical/sbpm_histology_old/slides/slide_113.jpg]

1.2.1 Identify the blood vessel labelled A and give a reason for your answer. (2)

1.2.2 Which blood vessel, A or B, will transport blood under a low pressure? (1)

1.3 A group of Grade 9 learners conducted an investigation into the effects of different types of exercise on heart rate. They measured the heart rate of 5 learners after each of the following activities:

- Rest
- after brisk walking for two minutes
- after jogging for two minutes
- after jumping with a skip rope for two minutes

The results are recorded in the table below.

<table>
<thead>
<tr>
<th>Heart rate (beats per minute) after each activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rest</td>
</tr>
<tr>
<td>Learner 1</td>
</tr>
<tr>
<td>Learner 2</td>
</tr>
<tr>
<td>Learner 3</td>
</tr>
<tr>
<td>Learner 4</td>
</tr>
<tr>
<td>Learner 5</td>
</tr>
<tr>
<td>AVERAGE</td>
</tr>
</tbody>
</table>
1.3.1 Explain how the heart rate could be determined. (2)

1.3.2 Calculate the value for X in the table (average heart rate for jumping). (2)

1.3.3 Draw a bar graph of the average results. (9)

1.3.4 Suggest a reason why a person's heart rate changes during exercise. (2)

**QUESTION 2: RESPIRATORY SYSTEM**

2.1 The diagrams below show some structures associated with breathing and gaseous exchange.

2.1.1 Name structures labelled 2 and 4. (2)

2.1.2 Identify the gases A and B in Diagram 2. (2)

2.1.3 Describe how any TWO features in either Diagram 1 or 2 make for an effective respiratory/gaseous exchange system. (4)

2.1.4 The structures in Diagram 2 would look very different in a person who suffers from emphysema in comparison to a normal healthy person. Describe how different these structures would look in a person with emphysema. (2)
2.2 The graph below shows the results from a spirometer which is an instrument used to determine the volume of air in the lungs of a person. The graph represents normal breathing with a period of deep breathing.

![Graph showing normal and deep breathing]

2.2.1 What is the volume of air breathed out during deep breathing? (2)

2.2.2 How many times did deep exhalation take place in this experiment? (2)

2.2.3 Use your knowledge of the respiratory system and the following words below to explain in a paragraph what happens during inhalation (breathing in). (4)

*diaphragm, intercostal muscles, pressure inside chest cavity, volume of chest cavity.*
QUESTION 3: HUMAN REPRODUCTION

3.1 Study the diagram below of the female reproductive system and answer the questions that follow.

![Female Reproductive System Diagram]

3.1.1 Identify part numbered 3 and give its function. (2)

3.1.2 Part numbered two produces eggs and female reproductive hormones. Identify one hormone that is produced by part numbered 2. (1)

3.1.3 A condom is a popular contraceptive that is promoted by the government and often available freely for the population. Explain fully why the government would promote condoms above other contraceptives. (2)

3.2 Draw a labelled diagram of a sperm cell. (5)
QUESTION 4: BODY SYSTEMS

Read the information below and answer the questions

CROHN'S DISEASE

Crohn's disease is a chronic (ongoing) disorder that causes inflammation of the digestive tract. It can affect any part of the gut but most commonly affects the small and large intestines. The disease tends to run in families (there is a genetic link) and affects mainly people between 15 and 35, although older people can also get it.

Researchers believe that, in people with Crohn's disease, the immune system (which normally protects the body from infection) reacts against bacteria that live in the intestine and attacks these using white blood cells. These white blood cells move into the intestine lining and produce inflammation. The inflamed cells release products that injure the intestines. Substances in the environment are also believed to cause the disease. Crohn's disease is more common in the developed world, particularly in the United States of America and Europe.

(Source = http://www.ccfa.org/info/about/crohns)

4.1 Identify the body system that is affected when someone suffers from Crohn’s disease. (1)

4.2 Researchers believe that there are three main causes of this disease. Describe two of these causes. (2)

4.3 Look at the diagram of the figure above. Write down the numbers of the parts usually affected. (2)

4.4 Suggest a reason why Crohn’s disease occurs mostly in the “developed world”? (2)

[SECTION B TOTAL: 60]

[PAPER 1 TOTAL: 100]