Hillcrest High School

Life Science Exam

Grade 10 | Paper 1

November 2014 | Examiner: Mrs Harmse

Time: 2½ hours | 150 Marks

Instructions

1. Write your Life Science teachers name on all booklets.
2. Number the answers exactly as the questions are numbered.
3. Write neatly and legibly
4. Do all drawings in pencil and label them in ink.
5. Only draw diagrams and flow charts when requested to do so.
6. The diagrams in the question paper may not necessarily be drawn to scale.
7. Non-programmable calculators, protractors and compasses may be used.

SECTION A

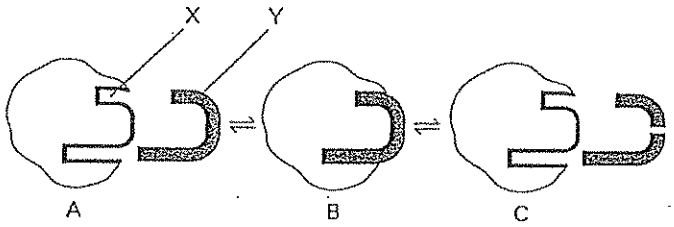
Question 1

1.1 Various possible options are provided as answers to the following questions. Choose the correct answer and write only the letter (A-D) next to the question number(1.1.1-1.1.10) in your answer book, for e.g. 1.1.6 C

1.1.1 Proteins are made up of:

A- Monosaccharides
B- Amino acids
C- Nucleic acids
D- Nucleotides

1.1.2 Which property of enzymes is illustrated by the diagram.



A- Enzymes act only on one substrate.
B- Enzymes are sensitive to temperature
C- Enzymes are sensitive to pH
D- Enzymes are protein in nature.

1.1.3 The part of the plant cell responsible for providing support is...

A- The cell wall only
B- The vacuole only
C- The cell wall and the nucleus
D- The cell wall and the vacuole

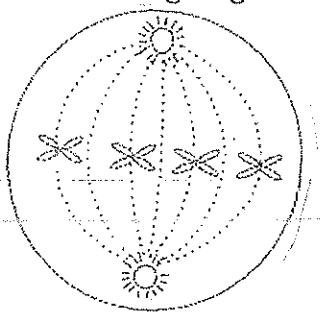
1.1.4 Which of the following does NOT play a role in plant support..

A. Collenchyma
B. Schlerenchyma
C. Parenchyma
D. Xylem

1.1.5 The correct term for the loss of water from the leaf surface is...

A- Translocation
B- Evaporation
C- Transparency
D- Transpiration

1.1.6 Study the following diagram.



The chromosome number of the cell is..

A- 2
B- 4
C- 6
D- 8

1.1.7 In a cell nucleus, the thread like structure are called..

A- Centrioles
B- Centrosomes
C- Centromeres
D- Chromosomes

1.1.8 Each new cell produced by mitosis will have...

A- Half the number of chromosomes
B- A full set of chromosomes
C- Twice the number of chromosomes
D- Two new nuclei

1.1.9 Which of the following is not a function of mitosis?

A- Growth
B- Repair
C- Asexual reproduction in unicellular organisms
D- The formation of sex cells

1.1.10 If a cell divides by mitosis, how many cells will there be after three divisions:

A- 3 cells
B- 4 cells
C- 8 cells
D- 16 cells

(Total 20)

1.2 Give the correct biological term for each of the following descriptions.

1.2.1 The chemical indicator used to test the presence of starch.
1.2.2 A collection of similar cells that perform a specific function.
1.2.3 The jelly-like fluid inside the nucleus.
1.2.4 Muscles that are connected to the skeleton
1.2.5 The thin waxy layer that prevents water loss from the leaf surface.
1.2.6 Specialised epidermal cells that surround the stomata of plants.
1.2.7 The substance which an enzyme acts upon.
1.2.8 The growth or tumour that forms as a result of uncontrolled mitosis.
1.2.9 Blood corpuscles that play a role in blood clotting.
1.2.10 Plant tissue with unevenly thickened cell walls.

(Total 10)

1.3 For each of the following statements in column one, state whether it applies to A only, B only,both A and B, or neither A nor B

	COLUMN A	COLUMN B
1.3.1	Component of phloem tissue	A. Sieve tubes B. Companion cells
1.3.2	Responsible for protein synthesis	A. Ribosomes B. Lysosomes
1.3.3	Plant cells without nuclei	A. Sieve tube B. Xylem vessels
1.3.4	The first vertebra of the human vertebral column	A. Axis B. Atlas
1.3.5	Joins ribs to the sternum	A. Bone B. Cartilage
1.3.6	Deficiency disease that develops due to a shortage of fresh fruit and vegetables in the diet	A. Kwashiorkor B. Beri beri
1.3.7	The type of lipids that form part of the cell membrane	A. Phospholipid B. Saturated lipid
1.3.8	Controls slow involuntary movement in the human body	A. Striated muscle tissue B. Smooth muscle tissue
1.3.9	Actively dividing tissue	A. Epidermal B. Epithelial
1.3.10	Location of cuboidal epithelium	A. Salivary glands B. Sweat gland

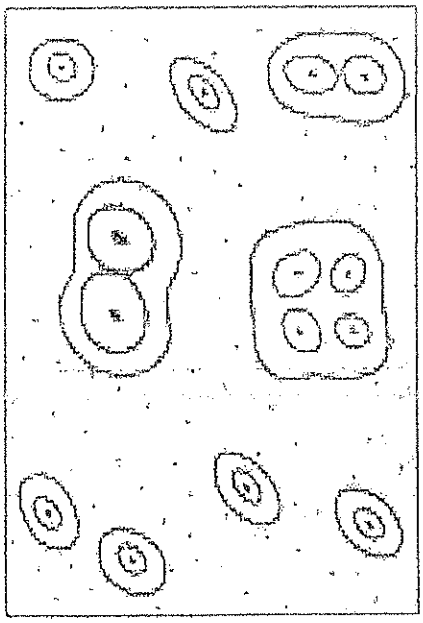
(Total 20)

(Total Section A: 50)

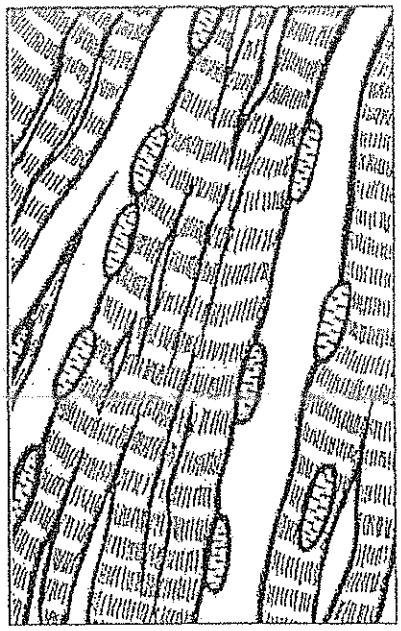
SECTION B

2.1 The diagram below represents different types of animal tissue.

A



B



C

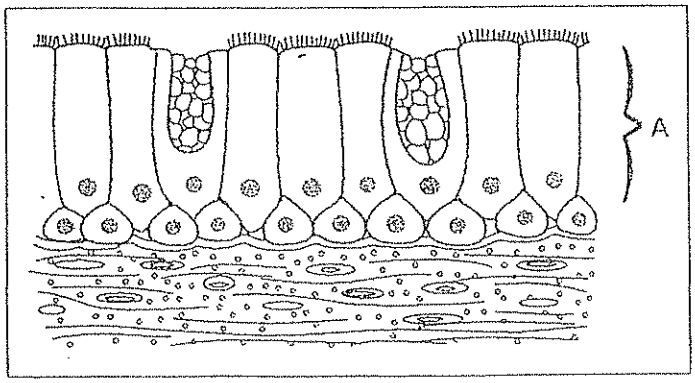
2.1.1 Provide labels for the tissues, A, B and C. (3)

2.1.2 State TWO functions of tissue A. (2)

2.1.3 Name TWO locations in the body where tissue B occurs? (2)

2.1.4 Describe the structure and function of tissue C (3)

2.2 The diagram below represents tissue that is found in the Respiratory system.



2.2.1 Identify the tissue labelled A. (1)

2.2.2 Which parts of the respiratory system does this tissue line? (2)

2.2.3 State the function of this tissue. (1)

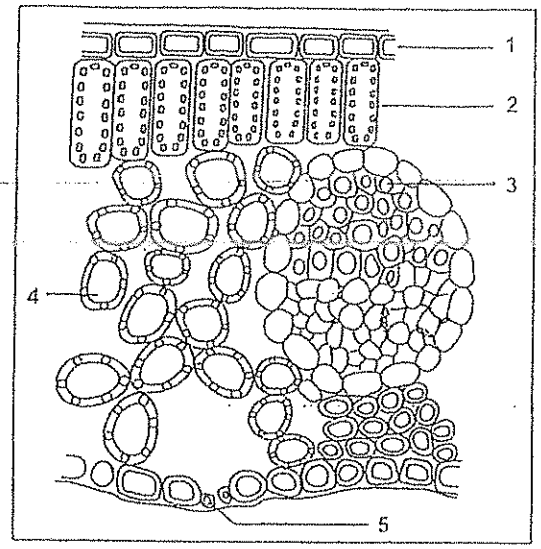
2.2.4 Name the specialised cells in this tissue that secrete mucus. (1)

2.2 Which parts of the respiratory system does this tissue line? (2)

2.3 State the function of this tissue. (1)

2.4 Name the specialized cells in this tissue that secrete mucus. (1)

23 Study the diagram and answer the questions which follow.



2.3.1 Provide labels for parts numbered1, 2, 3 and 4. (4)

2.3.2 Explain ONE functional difference between part 2 and part 4. (2)

2.4 Read the following extract.

> Cancer is a disease in which the body's cells display uncontrolled division. Cancer cells may invade nearby tissue and may spread throughout the bloodstream or lymphatic system to other parts of the body.
>
> Nearly all cancers are caused by abnormalities in the genetic material of transformed cells. These abnormalities may be caused by carcinogens.
>
> Diagnosis usually requires the histologic examination of a tissue biopsy specimen by a pathologist. Most cancers can be treated and some can be cured, depending on the specific type, location and stage of the cancer.

2.4.1 Define the term cancer. (2)

2.4.2 Give the term for:
"The spread of cancer to other locations in the body through the blood stream" (1)

2.4.3 Name ONE carcinogen (1)

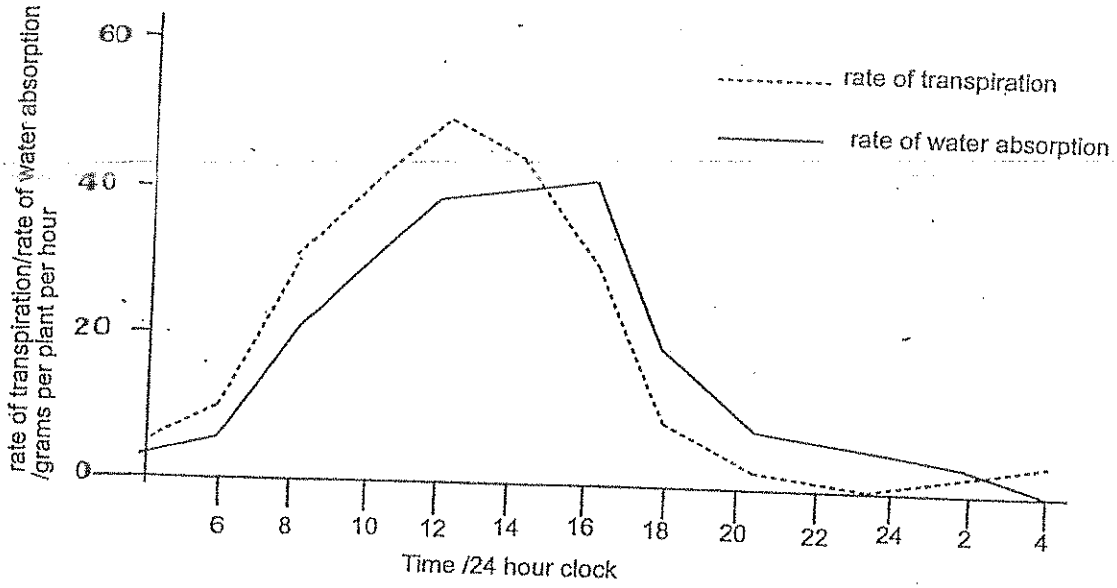
2.4.4 Define the following terms:

a) Histologic examination (1)

b) Biopsy. (1)

2.4.5 Name TWO ways in which cancer can be treated. (2)

2.5 Study the graph below, which shows the rate of transpiration and water absorption in a plant.



2.5.1 Name THRE environmental factors which could directly influence the rate of transpiration from the leaves of the plant. (3)

2.5.2 Choose ONE factor that you have mentioned in questions 2.5.1 and explain why it could cause the rapid decrease in the rate of transpiration after 16h00. (3)

2.5.3 Describe what the plant might look like at 14h00, and explain why. (3)

2.5.4 Name the:

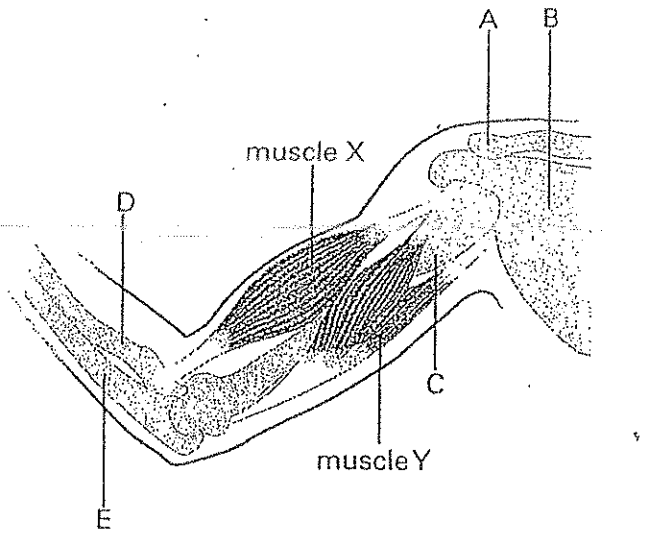
a) Dependent variable

b) Independent variable. (2)

(Total 40)

Question 3

3.1 Refer to the diagram and answer the questions that follow.



3.1.1 Describe what will happen to the arm when muscle X contracts (2)

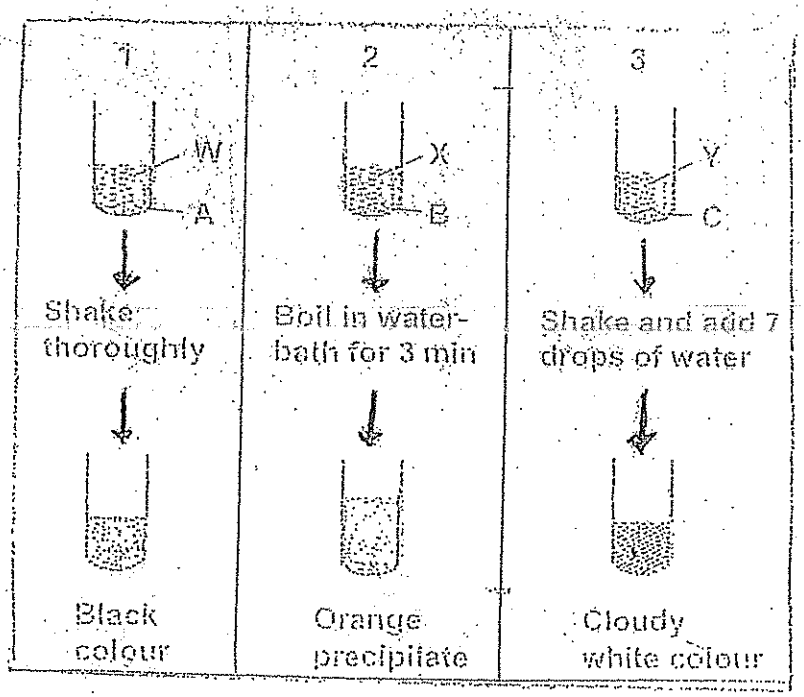
3.1.2 Muscle Y reverses the effect produced by muscle X. why is a second muscle needed. (2)

3.1.3 Label the bones A-E on the diagram. (5)

3.1.4 What joins muscle X to the bone? (1)

3.1.5 identify TWO types of joints in this diagram and explain the type of movement each type provides. (6)

3.2 The diagram below shows how three different food tests (1, 2 and 3) were carried out. A, B and C indicate the food sample and W, X and Y the reagent that was added to the food sample. Each gave a positive result.



3.2.1 Identify reagents W, X and Y respectively. (3)

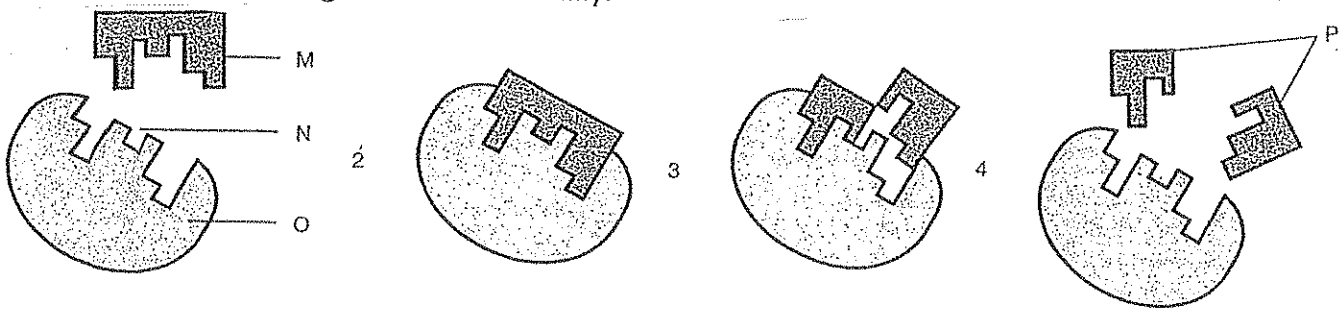
3.2.2 Name the nutrients tested in samples 1, 2 and 3. (3)

3.2.3 What do we call

a) Test 1 (1)

b) Test 2 (1)

3.2 Examine the diagram below carefully.



3.3.1 Provide labels for the parts labeled M, N, O and P. (4)

3.3.2 Give one function of enzymes. (1)

3.3.3 If enzymes are heated too much, they become denatured. What does this mean? (2)

3.4 The average number of erythrocytes (red blood corpuscles) in the blood of humans living at different heights above sea level is shown in the following table. Each reading represents the average for ten adult males living at that height for least 4 months.

Table 1

Height (m)	Average number of erythrocytes (million/mm^3blood)
0	5.1
1500	5.3
3000	5.4
4500	5.6
6000	5.9
7500	6.2

The winning times for three different events at the Olympic Games, hoasted in three different cities of the world, are represented in the following table. Each city is located at different altitudes.

Table 2

City	Height (m)	Events		
		800m	5000m	10000m
Tokyo	200	1min 45.1sec	13min 44.8sec	28min 24.4sec
Mexico City	2240	1min 44.3sec	13min 28.4sec	29min 27.9sec
Munchen	52	1min 45.9sec	13min 26.4sec	27min 38.4sec

3.4.1 Draw a line graph to represent the average number of erythrocytes for 10 adult males living in different heights above sea level. As seen in table 1 (4)

3.4.2 State ONE generalization that can be made relating to the average number of erythrocytes and the altitude. (1)

3.4.3 Why are the averages of erythrocytes for ten individuals used rather than the average for one person? (1)

3.4.4 Describe the relationship between the athlete's performance and the altitude. (1)

3.4.5 Which events are most affected by altitude? (2)

(Total 40)

(Total section B= 80)

Section C

Question 4

Write an essay in which you compare the different skeletons found in living organisms. Your essay must include the advantages, disadvantages and an example of the skeleton types.

NOTE: No marks will be awarded for answers in the form of flow charts or diagrams.

Content: 17
Synthesis: 3

(Total Section C =20)

Grand total=150