Department of Education
Greenbury Secondary School
Final Examination 2017 Gr 10
Life Science Paper 3 – Practicals

Examiner: C . Jugdhaw
Moderators : S. Singh , K.Govender
Name : .....

Duration : 1hr
Marks : 60
Gr/ div : 10 .....

Instruction

1. This paper consist of 7 pages
2. Answer ALL the questions
3. Drawings must be done in pencil and labelled in ink

.....

QUESTION ONE ; HANDLING EQUIPMENT AND APPARATUS ; DRAWING SKILLS; FOLLOWING INSTRUCTIONS **15 minutes**

1.1 Observe the MICROSCOPE before you.

1.1.1 Provide labels for the parts marked :

A _____ B _____ (2)

1.1.2 State the function of the parts marked :

C._____

D._____ (2)

1.1.3 You are provided with the following : small piece of onion ; slide ; dropper cover slip ; iodine solution ; tweezer

Do the following : Put a small drop of iodine solution on a clean microscope slide

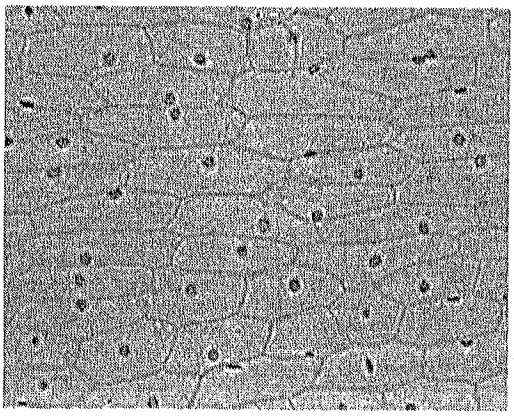
- Peel off the epidermis layer from the inner surface of an onion using a tweezer or your finger nail
- Immediately put the onion epidermis into the iodine solution
- Lower the cover slip slowly to avoid trapping air bubbles

a) Make a wet mount slide of onion epidermis.

☐ Correct technique used ☐ no /little air bubbles (2)

b) If you had to view this slide under the microscope using a 5x eyepiece and a 10x objective .What would the magnification be._____ (2)

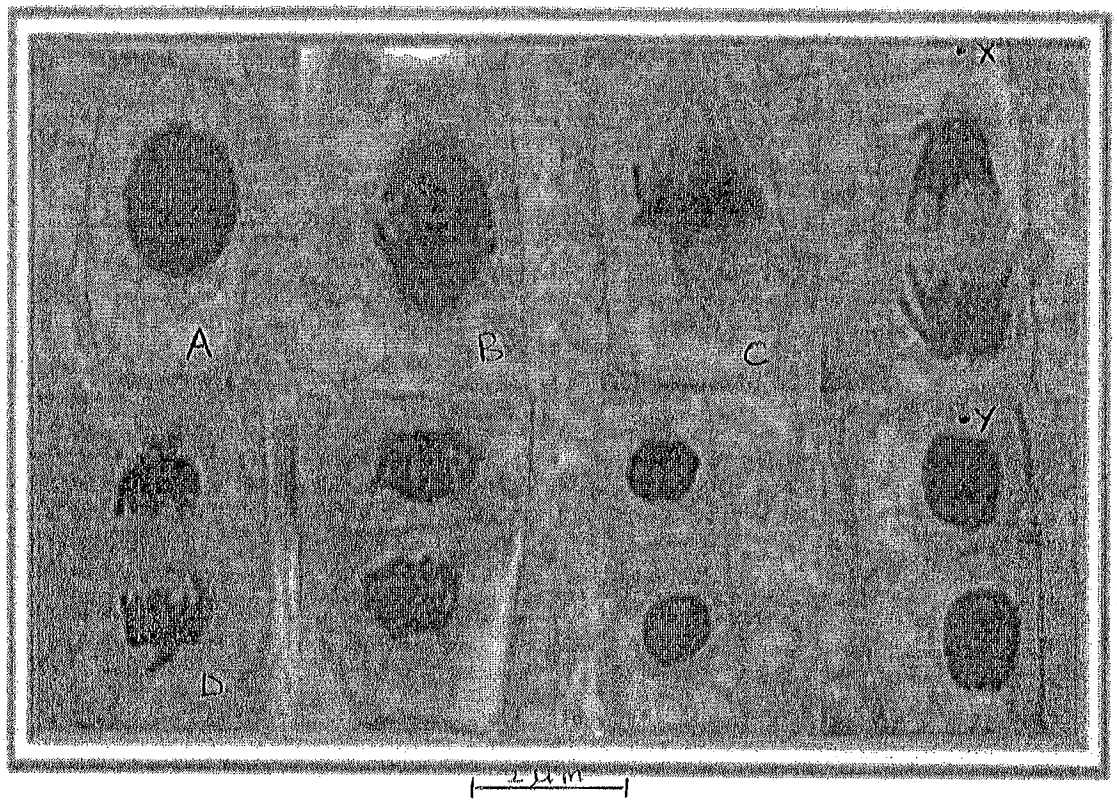
c) Study the micrograph below. Draw and label **3 cells** from the micrograph. (4)



1.2 INTERPRET INFORMATION

10 Minutes

Refer to the micrograph below, showing MITOSIS cell division , and answer the questions that follow:



1.2.1 State ONE significance of mitosis .

_____ (1)

1.2.2 Calculate the actual size of the cell marked **X-Y.**

_____

_____

_____ (3)

1.2.3 How many cells will form after cell A undergoes this division?_____ (1)

1.2.4 If the cells in this MICROGRAPH have 10 chromatin threads each during interphase (ie before cell division begins), then, how many…….

(i) **chromatids** will there be in phase marked B?_____

(ii) **centromeres** will there be in phase marked C?_____

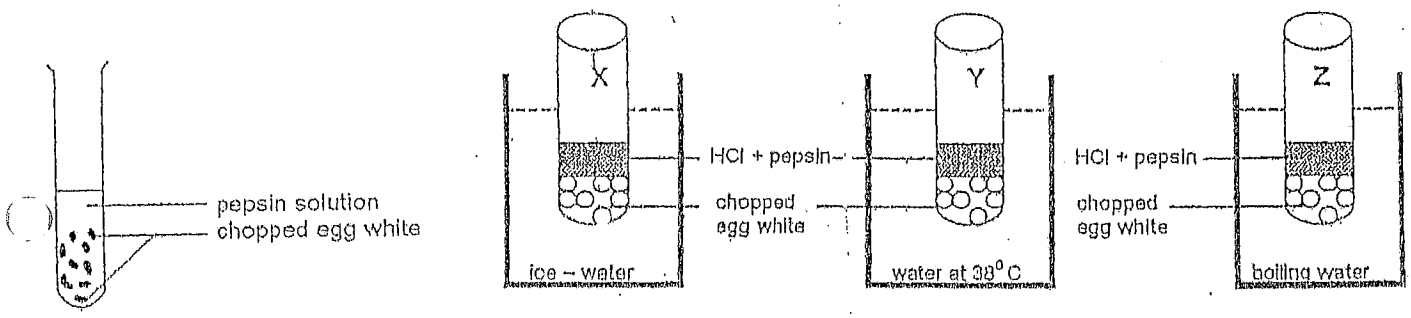
(iii) **daughter chromosomes** will there be in phase marked D?_____ (3)

QUESTION TWO : 12 minutes

The diagram below represents apparatus used in an investigation . In each of three test tubes (**X, Y** and **Z)** the following substances were added :

- Chopped egg white
- Pepsin (an enzyme)
- Hydrochloric acid (HCl)

Each of these test tubes was then placed in a bath of different temperatures and set aside for a day.



2.1 State the hypothesis for the above investigation. _____

_____ (2)

2.2 State the aim of this investigation. _____

_____ (1)

2.3 What was the purpose of HCl in each test tube ? _____

_____ (2)

2.4 State the following variables in the above investigation

2.4.1 dependent variable _____ (1)

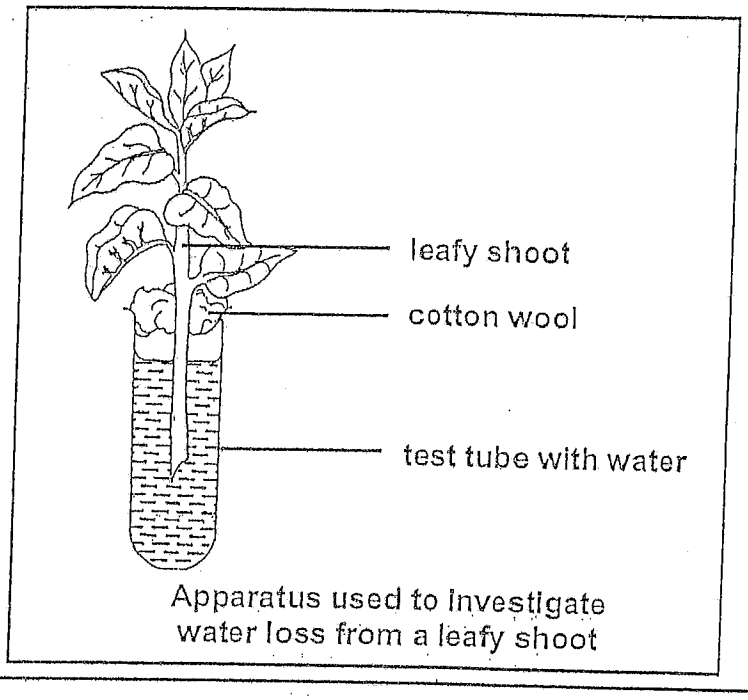
2.4.2 independent variable _____ (1)

2.4.3 constant variables _____ (2)

2.5 Record your results in a table in the space provided,below (6) **(15)**

QUESTION THREE : DRAWING A GRAPH /INTERPRETING DATA 15MINUTES

Set up the apparatus as shown in the diagram below.



Apparatus used to investigate water loss from a leafy shoot

The apparatus above was set up to investigate water loss from a leafy shoot. The total mass of the apparatus at the beginning of the investigation was 150 g.

The apparatus was then weighed at 10-minute intervals over the next 50 minutes. After 50 minutes, the apparatus was taken outdoors and weighed every 10 minutes for another 50 minutes.

The table below shows the decrease in mass of the apparatus over time in relation to the original mass of 150 g.

	INSIDE						OUTSIDE				
Time (minutes)	0	10	20	30	40	50	60	70	80	90	100
Decrease in mass (g)	0	1	3	4	5	9	11	21	24	33	39

3.1 Name TWO environmental factors that could have caused the greater decrease in mass after 50minutes . _____

_____ (2)

3.2 State ONE way in which the reliability of the results could have been improved .

_____ (1)

3.3 Calculate the mass of the apparatus after 80 minutes. Show your working. _____

_____

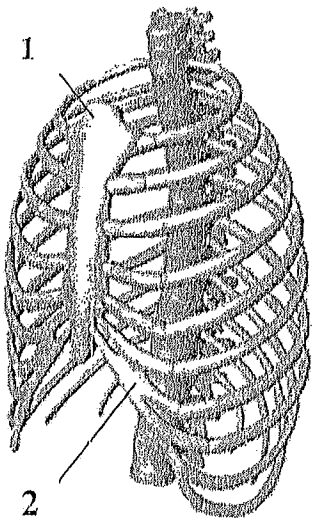
_____ (2)

3.4 Plot a line graph of the above results.

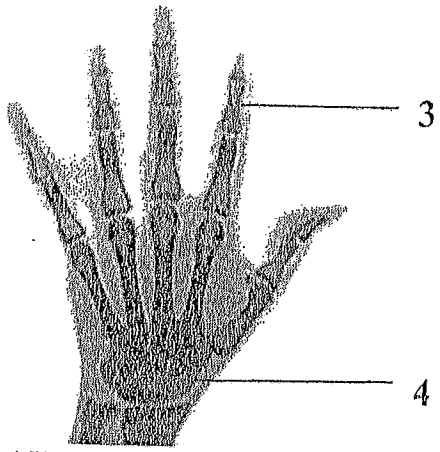
(8)

QUESTION FOUR: INTERPRET INFORMATION

4.1 Study the model representing the human rib cage and the x-ray of the human.



MODEL OF HUMAN RIB CAGE



X-RAY OF HUMAN HAND

4.1.1 Name the parts labelled: 1- _____

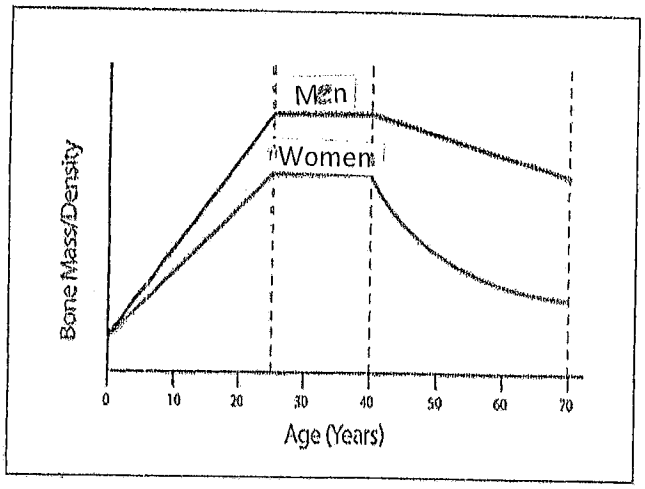
2- _____

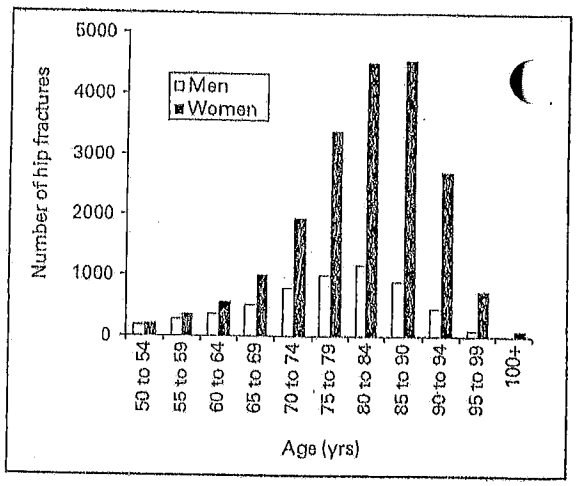
3- _____

4- _____(4)

4.1.2 Name an important mineral that strengthens bone. _____(1)

4.1.3 Fractures in human are more common in one gender than the other. Study the data below and answer the questions set on them.





a) Which age group in males have:

- The highest mass/density in bone? _____
- The highest number of hip fractures? _____(2)

b) What is the relationship between age and bone mass/density in humans? _____

_____(3)

c) What is the relationship between bone mass/density and fractures? _____

_____(1)

d) What is the relationship between fractures and gender in humans? _____

_____(1)

4.2 Use the DICHOTOMOUS KEY below, and the leaves (A, B and C) provided, to determine the plant to which EACH leaf belong.

1. a. narrow leaf b. broad leaf	go to 2 go to 3
2. a. hairs on lamina b. no hairs on lamina	*Panicum* (Switch grass) *Callistemon* (bottle brush tree)
3. a. net veined b. parallel veined	go to 4 *Lilioceris*(Lily)
4. a. serrated margin 5. b. smooth margin	*Hibiscus* *Bougainvillea*

A. _____

B. _____

C. _____(3)

[15]

the end

GREENBURY SECONDARY SCHOOL
DEPARTMENT OF MATHS & SCIENCES
H.O.D. MR L. PILLAY
31/08/2017

P7

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QUESTION ONE ; HANDLING EQUIPMENT AND APPARATUS ; DRAWING SKILLS; FOLLOWING INSTRUCTIONS **15 minutes**

1.1 Observe the MICROSCOPE before you.

1.1.1 Provide labels for the parts marked :

A body tube ✓ B arm ✓ (2)

1.1.2 State the function of the parts marked :

C. objective – magnifies specimen ✓

D. Coarse adjustment knob – bring specimen into focus (2) ✓

1.1.3 You are provided with the following : small piece of onion ; slide ; dropper cover slip ; iodine solution ; tweezer

Do the following : Put a small drop of iodine solution on a clean microscope slide

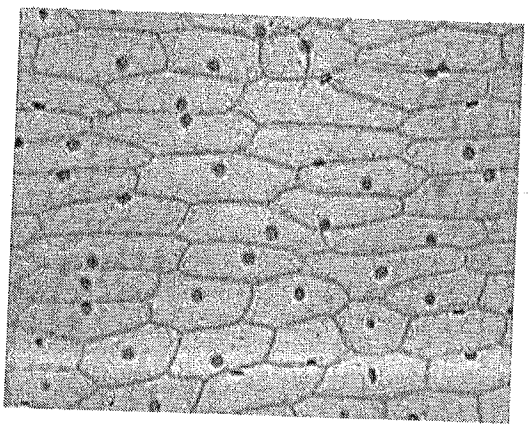
- Peel off the epidermis layer from the inner surface of an onion using a tweezer or your finger nail
- Immediately put the onion epidermis into the iodine solution
- Lower the cover slip slowly to avoid trapping air bubbles

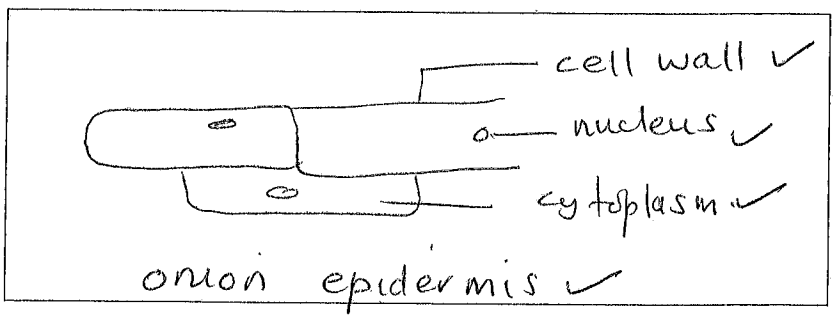
a) Make a wet mount slide of onion epidermis .

☐ Correct technique used ☐ no /little air bubbles (2)

b) If you had to view this slide under the microscope using a 5x eyepiece and a 10x objective .What would the magnification be. 5 X 10 = 50 X ✓ (2)

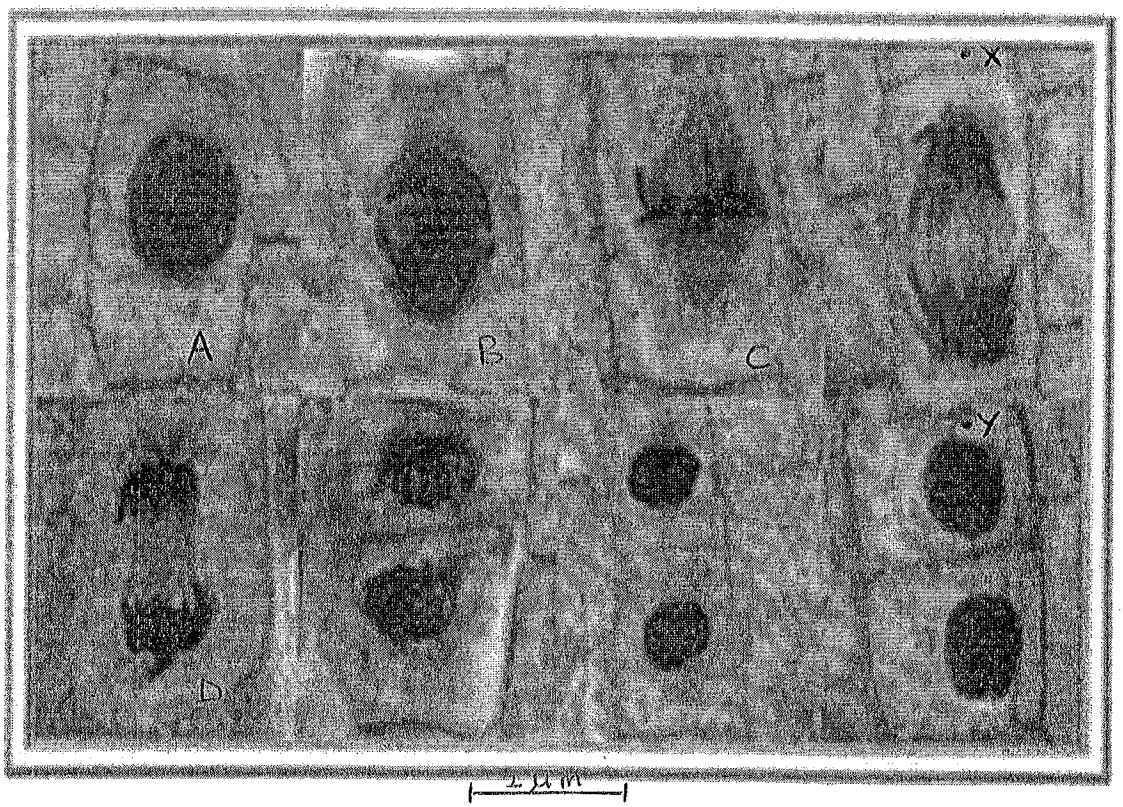
c) Study the micrograph below. Draw and label 3 cells from the micrograph. (4)





1.2 INTERPRET INFORMATION 10 Minutes

Refer to the micrograph below, showing a type of cell division, and answer the questions that follow:



1.2.1 State ONE significance of this cell division to plants.

growth / reproduction in simple organisms / repair / replace (1)

1.2.2 Calculate the actual size of the cell marked **X-Y.**

$= \frac{50}{20} \times 2\ \mu m$

$= 5\ cm$

(3)

1.2.3 How many cells will form after cell A undergoes this division? 2 (1)

1.2.4 If the cells in this MICROGRAPH have 10 chromarin threads each during interphase (ie before cell division begins), then, how many.....

(i) **chromatids** will there be in phase marked B? 20

(ii) **centromeres** will there be in phase marked C? 10

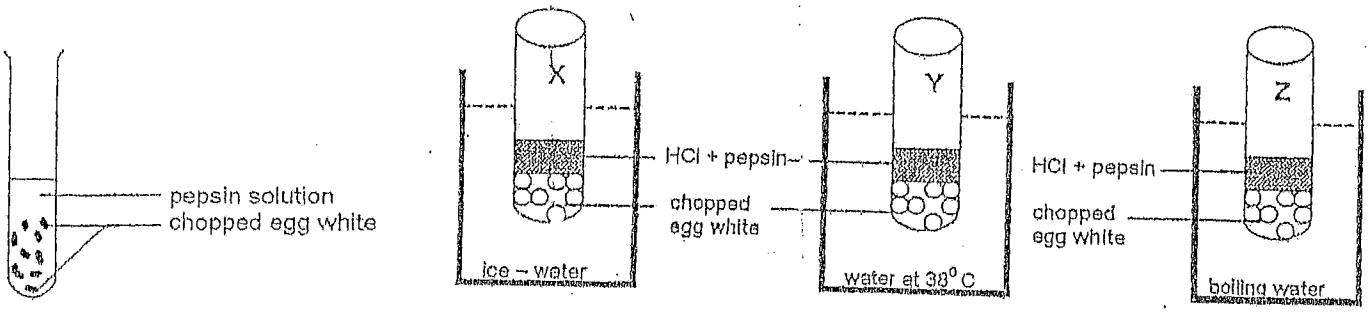
(iii) **chromosomes** will there be in phase marked D? 20 (3)

QUESTION TWO : 12 minutes

The diagram below represents apparatus used in an investigation . In each of three test tubes the following substances were added :

- Chopped egg white
- Pepsin (an enzyme)
- Hydrochloric acid (HCl)

Each of these test tubes was then placed in a bath of different temperatures and set aside for a day.



2.1 State the hypothesis for the above practical. Enzyme pepsin work best at optimum temp of 38°C ✓✓. Temp too low. enzyme inactive ✓ (2)

2.2 State the aim of this investigation. To investigate the effect of temp on enzyme / Enzyme sensativity / temp that enzymes are best active. (1)

2.3 What was the purpose of HCl in each test tube ? To provide an acid medium ✓ for pepsin to function ✓ (2)

2.4 State the following variables in the above investigation

2.4.1 dependent variable enzyme activity / digestion of egg white (1)

2.4.2 independent variable Temperature (1)

2.4.3 constant variables amount of enzyme (pepsin), substrate, pH, duration (2)

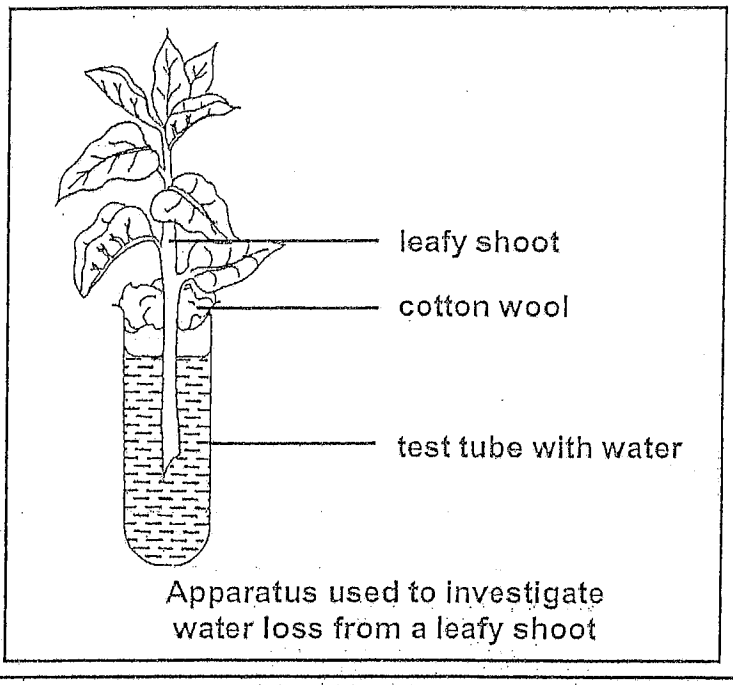
2.5 Record your results in a table in the space provided,below (6) **(15)**

TEST TUBE	TEMPERATURE	OBSERVATION EGG WHITE / RESULTS
X	ICE WATER	✓ NOT DIGESTED — DECREASE / INACTIVE
Y	38°C	✓ DIGESTED — INCREASE most active.
Z	BOILING WATER	✓ NOT DIGESTED — decrease denature.

✓ 1st dep. 2nd ✓

QUESTION THREE : DRAWING A GRAPH /INTERPRETING DATA 15MINUTES

Set up the apparatus as shown in the diagram below.



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The apparatus was then weighed at 10-minute intervals over the next 50 minutes. After 50 minutes, the apparatus was taken outdoors and weighed every 10 minutes for another 50 minutes.

The table below shows the decrease in mass of the apparatus over time in relation to the original mass of 150 g.

	INSIDE						OUTSIDE				
Time (minutes)	0	10	20	30	40	50	60	70	80	90	100
Decrease in mass (g)	0	1	3	4	5	9	11	21	24	33	39

3.1 Name TWO environmental factors that could have caused the greater decrease in mass after 50minutes . high light intensity / high temp / increased wind / low humidity (mark first 2) (2)

3.2 State ONE way in which the reliability of the results could have been improved . Repeat the investigation several times (1) mark first one.

3.3 Calculate the mass of the apparatus after 80 minutes. Show your working.

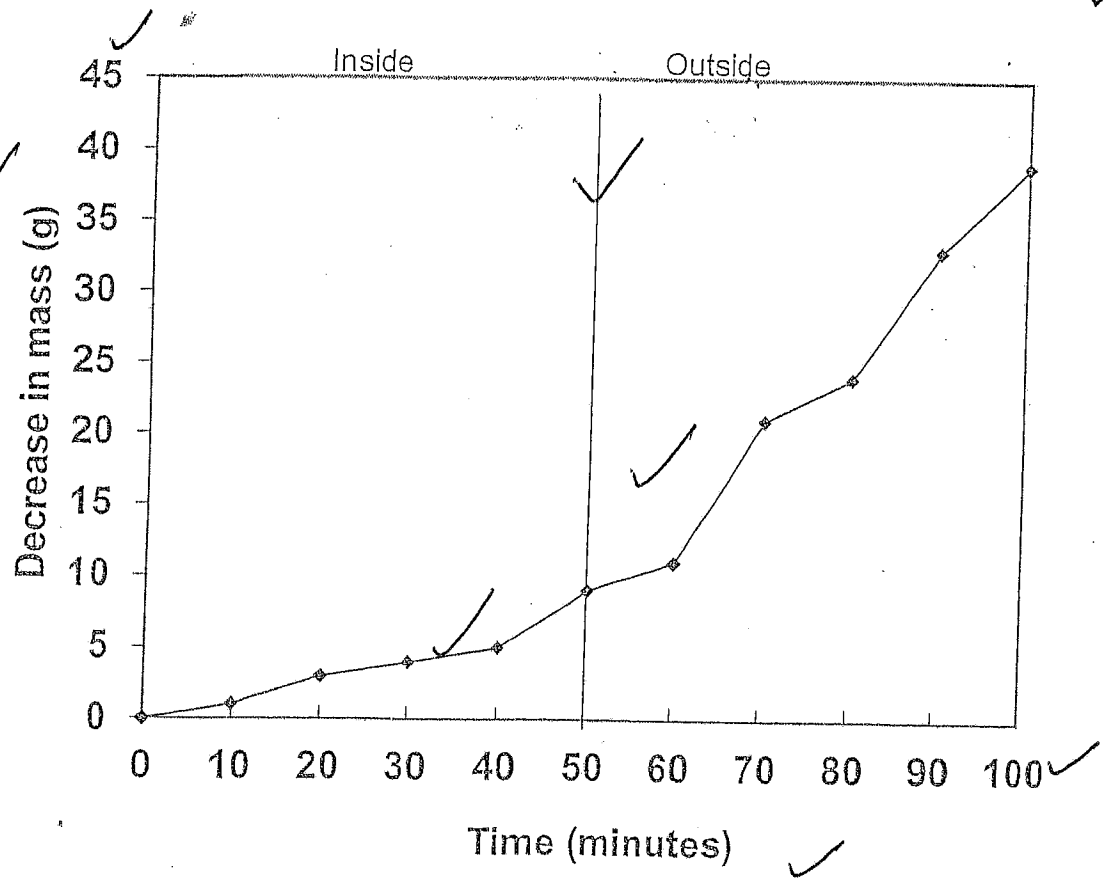
mass of apparatus after 80 minutes

(150 - 24) ✓ = 126 g ✓

(2)

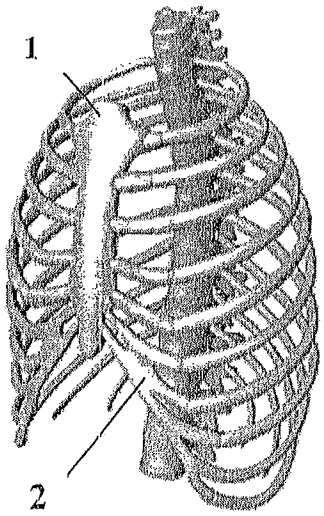
3.4 Plot a line graph of the above results. (8)

3.4 Graph showing the decrease in mass of the apparatus inside and outside the classroom.

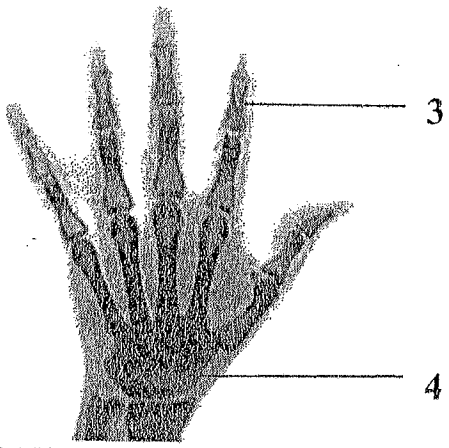


QUESTION FOUR: INTERPRET INFORMATION

4.1 Study the model representing the human rib cage and the x-ray of the human.



MODEL OF HUMAN RIB CAGE



X-RAY OF HUMAN HAND

4.1.1 Name the parts labelled: 1- sternum ✓

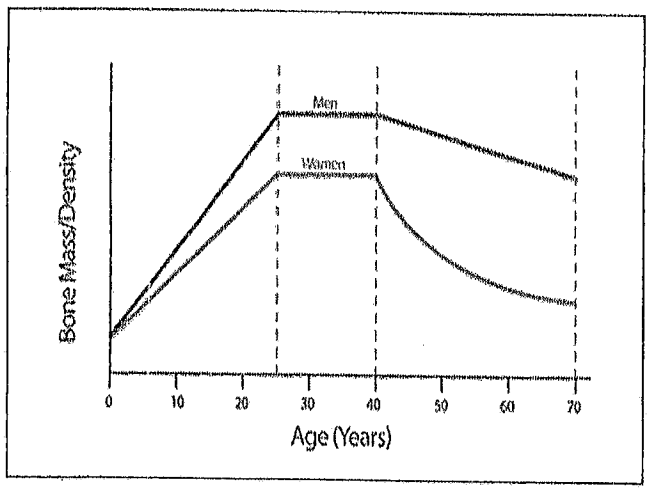
2- cartilage ✓

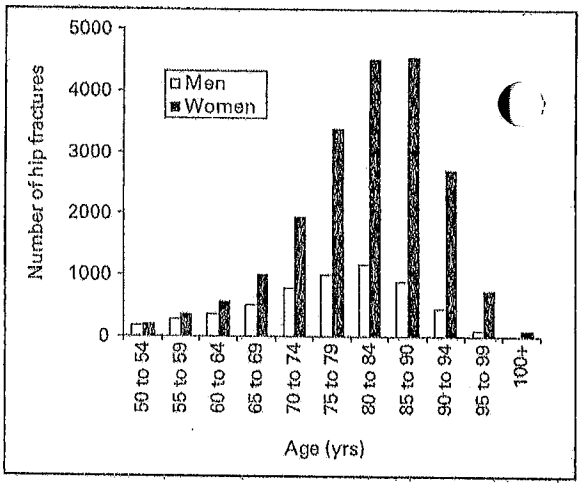
3- phalange ✓

4- carpel ✓ (4)

4.1.2 Name an important mineral that strengthens bone. calcium ✓ (1)

4.1.3 Fractures in human are more common in one gender than the other. Study the data below and answer the questions set on them.





a) Which age group in males have:

- The highest mass/density in bone? 25 - 40 years
- The highest number of hip fractures? 80 - 84 yrs (2)

b) What is the relationship between age and bone mass/density in humans? As age increases bone mass in humans increase until 25, then remain constant till 40 yrs, then decreases as you get older (3)

c) What is the relationship between bone mass/density and fractures? The lower the bone mass (in old age) the higher the incidence of fractures. (1)

d) What is the relationship between fractures and gender in humans? Women are more prone to fractures than males. (1)

4.2 Use the DICHOTOMOUS KEY below, and the leaves (A, B and C) provided, to determine the plant to which EACH leaf belong.

1. a. narrow leaf	go to 2
b. broad leaf	go to 3
2. a. hairs on lamina	*Panicum* (Switch grass)
b. no hairs on lamina	*Callistemon* (bottle brush tree)
3. a. net veined	go to 4
b. parallel veined	*Lilioceris*(Lily)
4. a. serrated margin	*Hibiscus*
5. b. smooth margin	*Bougainvillea*

A. Hibiscus

B. Bougainvillea

C. Callistemon. (3)

[15]

the end

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