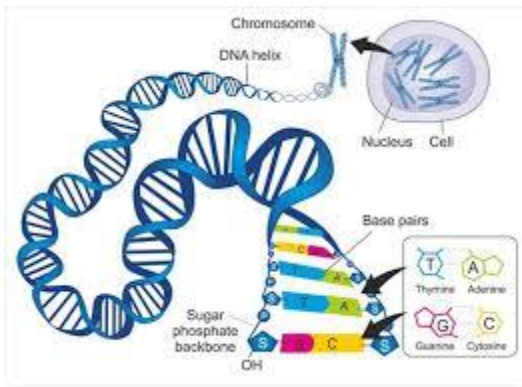




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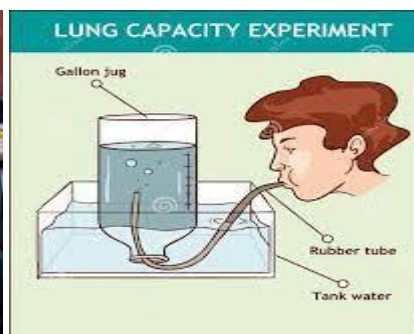
UMGUNGUNDLOVU DISTRICT



LIFE SCIENCES - GRADE 10 - 12

TERM 2 ASSESSMENT TASKS EXEMPLARS

2023



CONTENTS

No.	TASKS
1.	GRADE 10 ASSIGNMENTS
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3.	GRADE 11 ASSIGNMENTS
4.	GRADE 11 TOPIC TESTS
5.	GRADE 12 PRACTICAL TASKS
6.	GRADE 12 TOPIC TESTS

GRADE 10 TASKS

1. Assignments
2. Topic Tests



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UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

Grade: 11

DATE:

DURATION: 60 minutes

TASK: ASSIGNMENT

TOTAL MARKS: 50

TOPIC/S: PLANT AND ANIMAL TISSUES, LEAF STRUCTURE

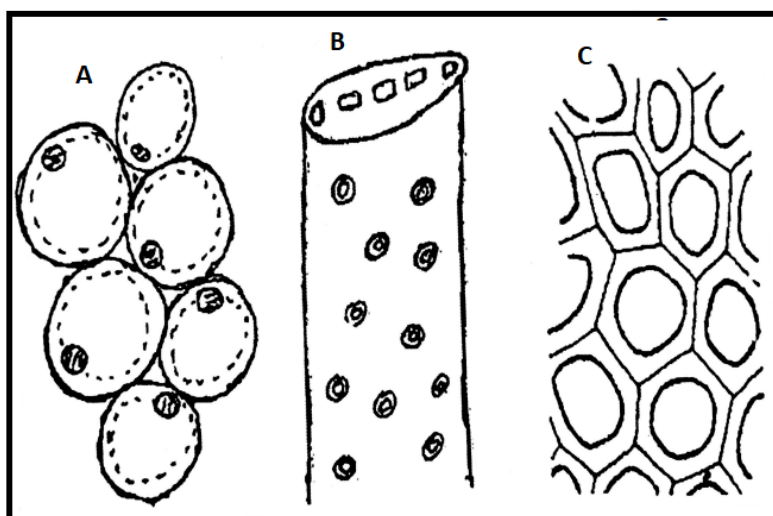
INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This is a formal SBA task and needs to be done under supervised conditions in the classroom.
2. Each learner completes this task on his/her own (under test conditions).
3. Answer **ALL** the questions.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Draw **ALL** diagrams in pencil and label in blue or black ink.
6. Write neatly and legibly

Question 1

1.1 The diagrams below represent plant tissues.



1.1.1 Identify the tissue (A, B or C) that...

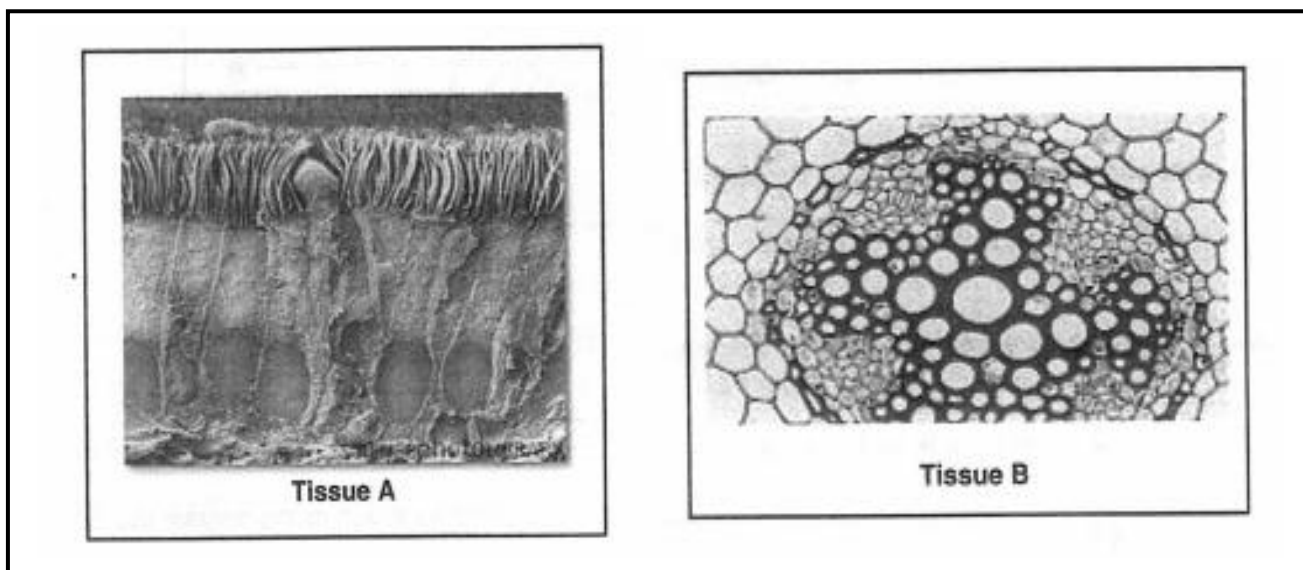
(a) transports water and mineral up a plant ' (1)

(b) provides mechanical support to the plant. (1)

1.1.2 Tabulate TWO visible structural differences between cells A and cells C. (5)

(7)

1.2 The diagrams below represent micrographs of animal tissue and plant tissue.



1.2.1 Identify the following:

(a) Tissue A (1)

(b) Tissue B (1)

- 1.2.2 Explain **TWO** structural adaptations of tissue **B** for its function. (4)
- 1.2.3 Identify the part of the human respiratory system in which tissue **A** is found. (1)
- 1.2.4 Draw **ONE** fully labelled cell from tissue **A**. (4)
- (11)**

TOTAL QUESTION 1: (18)

Question 2

- 2.1 Read the passage below and answer the questions that follow.

The use of stem cells

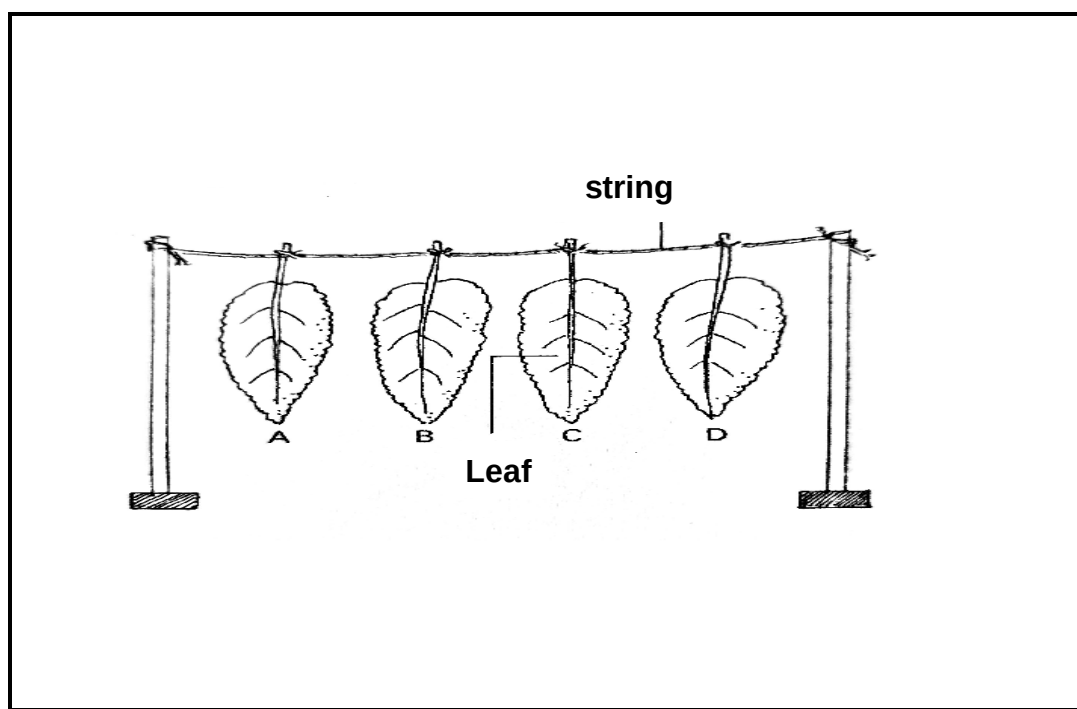
A patient at King Edward Hospital has been injected with human embryonic stem cells in an attempt to help him walk again. A group of doctors from Mandela University hope stem cells will help the nerves in the damaged spinal cord regenerate before the patient becomes permanently disabled.

The experiment uses cells obtained from five-day-old embryos. The treatment offers hope to patients suffering from spinal injuries. Researchers want to unlock the potential of stem cells for new ways of treating cancer and other illnesses.

- 2.1.1 Explain what stem cells are. (2)
- 2.1.2 Name ONE possible result of damage to the spinal nerves. (1)
- 2.1.3 Describe why some people support the use of stem cells. (2)
- 2.1.4 Describe TWO reasons why most doctors are against the use of embryonic stem cells. (2)
- (7)**

2.2 The following investigation was done to determine which leaf surface, the upper or the lower surface, had the greatest number of stomata. This affects the rate of transpiration.

Four freshly picked herbaceous broad leaves were weighed separately and then hung up as shown in the figure below.



The leaves were treated in the following ways:

- **Leaf A:** Vaseline was rubbed on both the upper surface and lower surface.
- **Leaf B:** Vaseline was rubbed on the upper surface.
- **Leaf C:** Vaseline was rubbed on the lower surface.
- **Leaf D:** Vaseline was rubbed on neither surface.

The leaves were hung outside in a warm, windy place. After two hours, the leaves were weighed again and the change in their weight was calculated.

2.2.1 Identify the:

- (a) independent variable (1)
- (b) dependent variable (1)

2.2.2 Describe the function of Vaseline in this investigation. (1)

2.2.3 Identify the leaf that is used as the control. (1)

2.2.4 Give ONE reason why a control needed in an investigation. (1)

2.2.5 Explain the observation in Leaf A.

(2)

(7)

TOTAL QUESTION 2:

(14)

Question 3

3.1 The table below shows the results on the ability of tendons and ligaments to stretch.

One sample is a tendon and the other sample is a ligament.

Amount of stretch measured in nm						
	Test 1	Test 2	Test 3	Test 4	Test 5	Average
Sample A	0.04	0.08	0.1	0.06	0.9	1.18
Sample B	2.1	1.9	1.8	2.0	1.8	9.6

3.1.1 Identify a sample that is most likely to be a tendon.

(1)

3.1.2 Explain your answer to QUESTION 3.1.1.

(2)

3.1.3 State ONE function of ligaments.

(1)

3.1.4 Explain ONE feature of ligaments that make them well suited for their function.

(2)

3.1.5 State ONE reason for performing the investigation five times.

(1)

3.1.6 Calculate the difference in the amount of stretch in sample A between tests 2 and 4.
Show all workings.

(2)

(9)

3.2 An investigation was carried out to determine the shortage of blood type 'O' that faces South Africa in three different blood banks (A, B and C). Blood from a person with blood type 'O' can be used safely in transfusions, into patients of any other blood type.

The table below shows the blood units available, and the blood units required by each blood bank.

Blood bank	Units of total blood in 2016 (litres)	
	Units of food available	Units of blood required
A	20	35
B	122	550
C	181	510

3.2.1 Draw a bar graph to represent the units of blood available in each of the three different blood banks.

(6)

- 3.2.2 State ONE reason why blood type 'O' is the most important blood type. (1)
- 3.2.3 Calculate how many blood units are needed in Blood Bank C to reach the maximum units required. (2)
Show ALL working. (9)
- TOTAL QUESTION 3: (18)**
- GRAND TOTAL: (50)**



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Department:
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UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

Grade: 10

DATE:

DURATION: 60 minutes

TASK: ASSIGNMENT

TOTAL MARKS: 50

TOPIC/S: SUPPORT AND TRANSPORT IN PLANTS AND SUPPORT IN ANIMALS

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This is a formal SBA task and needs to be done under supervised conditions in the classroom.
2. Each learner completes this task on his/her own (under test conditions).
3. Answer **ALL** the questions.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Draw **ALL** diagrams in pencil and label in blue or black ink.
6. Write neatly and legibly

Question 1

1. Read the extract and data provided below and answer the questions that follow.

A type of skeleton possessed by some Arthropods is known as an exoskeleton. The exoskeleton is a chitinous or calcareous hard covering on the outside of a body that supports and protects the internal tissues. The exoskeleton is a limiting factor for growth because they are hard and heavy. They also need to be shed when the organism grows and a new exoskeleton regrow.

A zoology student did a study on the size, mass, and the average time it takes for the regrowth of the exoskeletons of a variety of Beetle species. The study was conducted over a period of two years, studying a large sample of each of the beetle species.

Some of the results are shown in the table below:

Beetle name	Hercules	Scarab	Ground	Dung	Stag	Rhino
Average mass (g)	115	55	25	75	145	85
Average size (cm)	6.6	1.5	2.5	3.2	4.5	6.7
Average regrowth time (hours)	76	39	43	64	82	71

- 1.1

Name organic substance is the beetle’s exoskeleton made from.

(1)
- 1.2

Use the data in the table to draw a bar graph of the average mass(g) of the different Beetle species.

(6)
- 1.3

The Goliath beetle (not listed) is known to be the heaviest beetle in the world and can grow up to 10 cm long.

Explain:

(a)

why the growth of the Goliath beetles is limited to this size.

(2)

(b)

why the growth periods are dangerous times for animals with exoskeletons.

(2)
- 1.4

Use the data in the table and calculate the length (cm) of the Rhino beetle’s exoskeleton which will regrow per hour.

Show your working and round of to 2 decimal places.

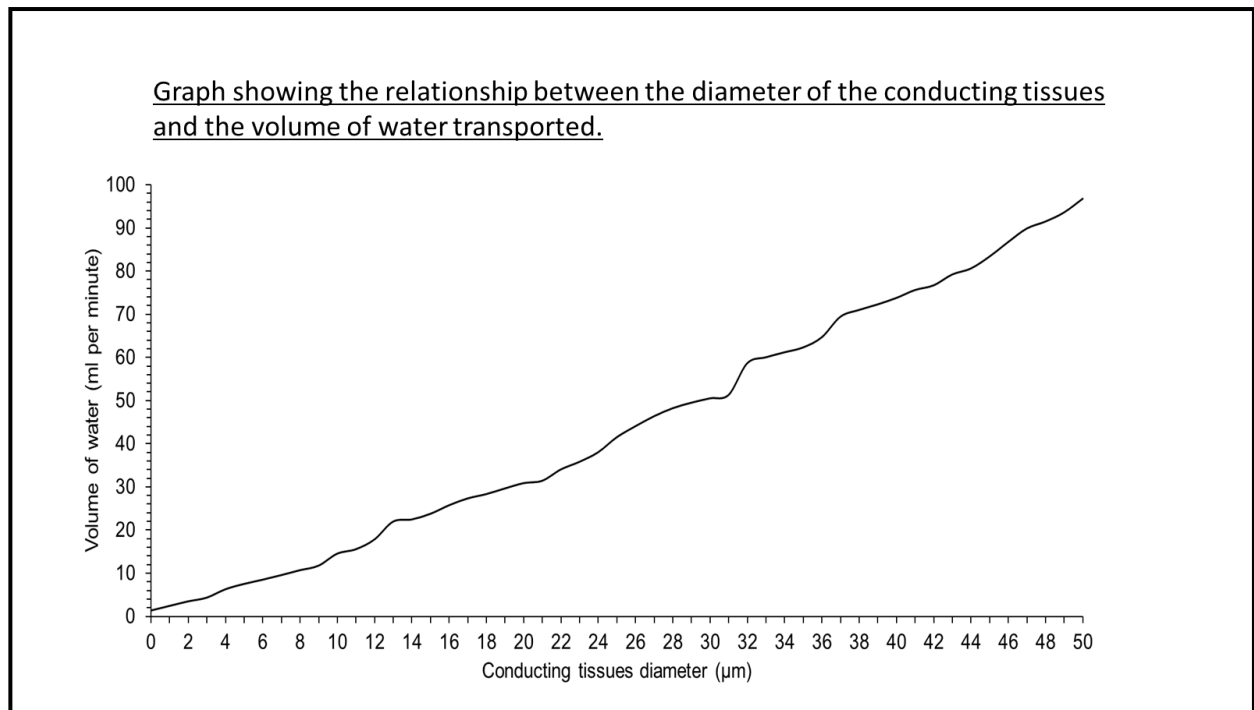
(3)

TOTAL QUESTION 1: (14)

Question 2

2. Plants require water, dissolved minerals, sunlight, chlorophyll, and carbon dioxide to photosynthesise and grow. Conducting tissues are responsible for transporting important substances around the plant to enable it to grow.

The graph below shows the diameter of the conducting tissues and the volume of water transported.



- 2.1 Identify AND provide the units of:
- (a) the independent variable (2)
 - (b) the dependent variable (2)
- 2.2 State the rate of water transported through the plant when the conducting tissue diameter is 25 µm. (1)
- 2.3 Describe the relationship between the diameter of the conducting tissues and the volume of water transported (2)
- 2.4 The measurements above were taken from a single tree.
- (a) Are the results of the investigation reliable? (1)
 - (b) State TWO ways in which the experiment could be improved. (2)
- 2.5
- (a) Identify the conductive tissues transports water in the plant. (1)
 - (b) Explain TWO adaptations of the conductive tissues mentioned in QUESTION 2.5 (a) to its function. (4)

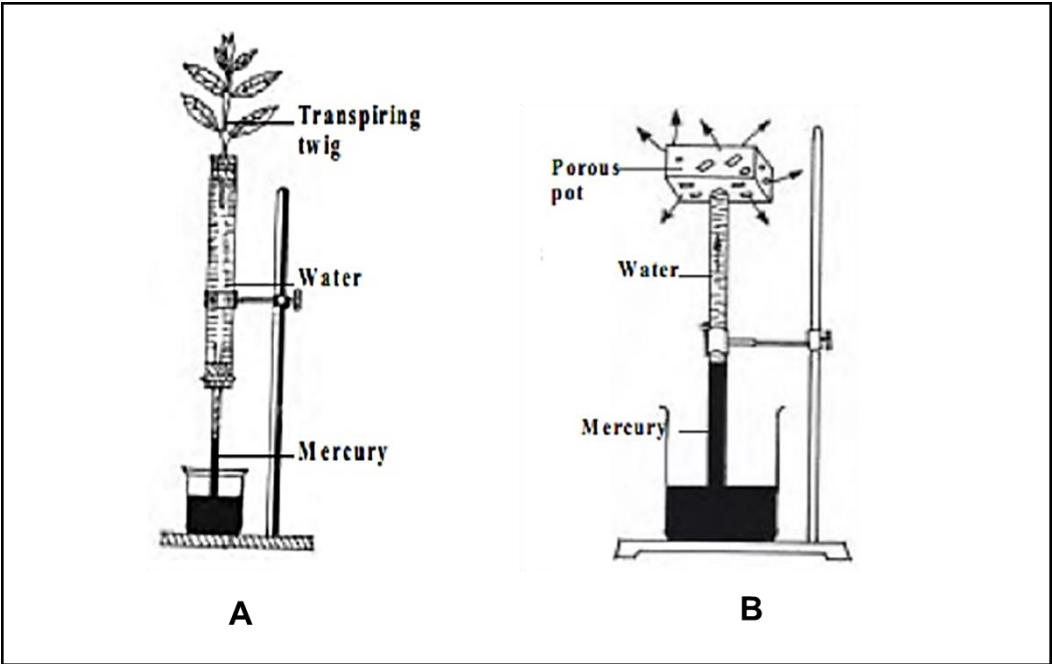
TOTAL QUESTION 2: (15)

Question 3

3. The rate of the loss of water from the leaves can be measured by determining the mass of the plant at one-hour intervals. An investigation was done to determine the effect of light intensity on the rate of water loss. The apparatus illustrated below was used for the investigation.

The procedure was as follows:

- Apparatus A was used to measure the rate of water loss from the leaves at several light intensities.
- Apparatus B was used to measure water loss through a porous pot during the same period.
- At each light intensity the apparatus was left for 15 minutes before starting the measurement.
- The water loss was calculated and recorded in the dark at four different light intensities.



The results are recorded in the following table.

Light intensities (kilolux)	Loss of water (g/hour)	
	Apparatus A	Apparatus B
0	1	0
10	15	0
20	20	0
30	22	0
40	22	0

3.1 Name the process by which a plant loses water as vapour as shown in apparatus A.

(1)

- 3.2 State ONE feature of a plant that assists it in reducing the process mentioned in QUESTION 3.1 above. (1)
- 3.3 Give ONE reason why it is necessary to cut the stems under the water when carrying out this investigation. (1)
- 3.4 Identify an apparatus (A or B) that represents the control in this investigation. (1)
- 3.5 Give ONE reason why it is recommended to set up a control in an investigation. (1)
- 3.6 Describe the relationship between water loss and light intensity as observed in the results of this investigation. (2)
- 3.7 At which light intensity would you expect the stomata to be fully open? (1)
- TOTAL QUESTION 3: (8)**

Question 4

4. The extract below discusses TWO diseases that can affect the human skeletal system.

Rickets is a deficiency disease where the bones become soft, bend and weaken the skeleton. This weakening leads to deformities and a high incidence of bone fractures. Rickets occurs in children, where bone development is still occurring. It is caused by a shortage of vitamin D.

Osteoporosis is a disease of the bones that is characterized by a decrease in bone density. Bones become porous and less dense due to a shortage of calcium. It leads to weakened bones, which greatly increases the risk of fracture of the hip, spine, and wrists. Osteoporosis is more common in older women. A curved back and decrease in height are visible signs of this disease.

The table shows the results of a study that measured 300 women's bone density between the age of 31 to 60 years of age. Each age range had 100 participants.

Bone mineral density (BMD) is a measurement of the amount of calcified tissue in grams per centimetre squared (g/cm²) of bone tissue. BMD can be thought of as the total amount of bone mass in a defined area. When BMD is high, bone strength will be great.

Results of bone density test are shown in the table below:

Age in years	Average bone density measured in BMD
31 – 40	3
41 – 50	1
51 – 60	- 4

- 4.1 According to the extract, name ONE cause of rickets. (1)
- 4.2 Suggest TWO ways that a person could prevent the development of rickets. (2)
- 4.3 State TWO visible signs mentioned in the extract that would suggest a person has osteoporosis. (2)
- 4.4 Name the disease/s mentioned in the extract that is/are more likely to lead to fractures in bones? (2)
- 4.5 (a) Identify the people that are most likely to develop osteoporosis. (1)
- (b) State the age in their life when they can develop osteoporosis. (1)
- 4.6 State the evidence in the study that supports your answer to QUESTION 4.5 above. (1)
- 4.7 Calculate the percentage of women that participated in the study above in the age range of 31- 40. (3)
- Show all workings.
- TOTAL QUESTION 4: (13)**
- GRAND TOTAL: (50)**



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UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

GRADE: 10

DATE:

DURATION: 30 minutes

TASK: TEST 1

TOTAL MARKS: 30

TOPIC/S: DIFFUSION AND OSMOSIS, PLANT TISSUES

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer **ALL** the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. Draw **ALL** diagrams in pencil and label in blue or black ink.
4. Write neatly and legibly

SECTION A

Question 1

- 1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.3) in your ANSWER BOOK, for example 1.1.4 D.

1.1.1 Name the plant tissue that serves as a storage tissue for starch.

- A sclerenchyma
- B parenchyma
- C vascular tissue
- D collenchyma

1.1.2 A learner was shown two slides of plant tissues: parenchyma and sclerenchyma. Name the features that would identify the sclerenchyma tissue.

- A Location of nucleus
- B Size of cells
- C Thickness of cell walls
- D Position of vacuoles

1.1.3 A scientist carried out an investigation on the rate of diffusion under three different temperature conditions: 15°C, 25°C and 35°C.

Which ONE of the following statements applies to the above investigation?

- A Temperature is the dependent variable
- B The aim is to investigate whether temperature has an effect on the rate of diffusion
- C The aim is to investigate whether the rate of diffusion has an effect on temperature
- D For the investigation to be valid, the temperature should be kept constant

(3 x 2) **(6)**

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.4) in your ANSWER BOOK.

1.2.1 A tissue that gives rise to new xylem and phloem.

1.2.2 The tissue that continuously forms new cells in the tips of roots and stems in plants.

1.2.3 Parenchyma cells that contain chlorophyll.

1.2.4 The type of tissue covering and protecting all the plant organs.

(4 x 1)

(4)

TOTAL SECTION A:

(10)

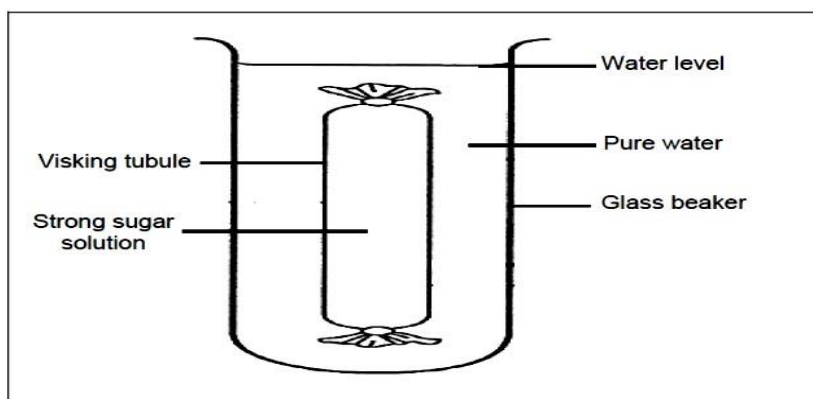
SECTION B

Question 2

2. Grade 10 learners set up an apparatus below in the school laboratory using visking tubing. Visking tubing allows water to move in and out, similar to the cell membrane of the cell.

Learners:

- Recorded the level of water in the beaker before the start of the investigation.
- After 2 hours the level of water in the beaker were recorded again.



2.1 Name the process that is being investigated in the diagram above.

(1)

2.2 State ONE characteristic of the visking tubing that enables it to function like a cell membrane.

(1)

2.3 Describe how a control can be set up for this investigation.

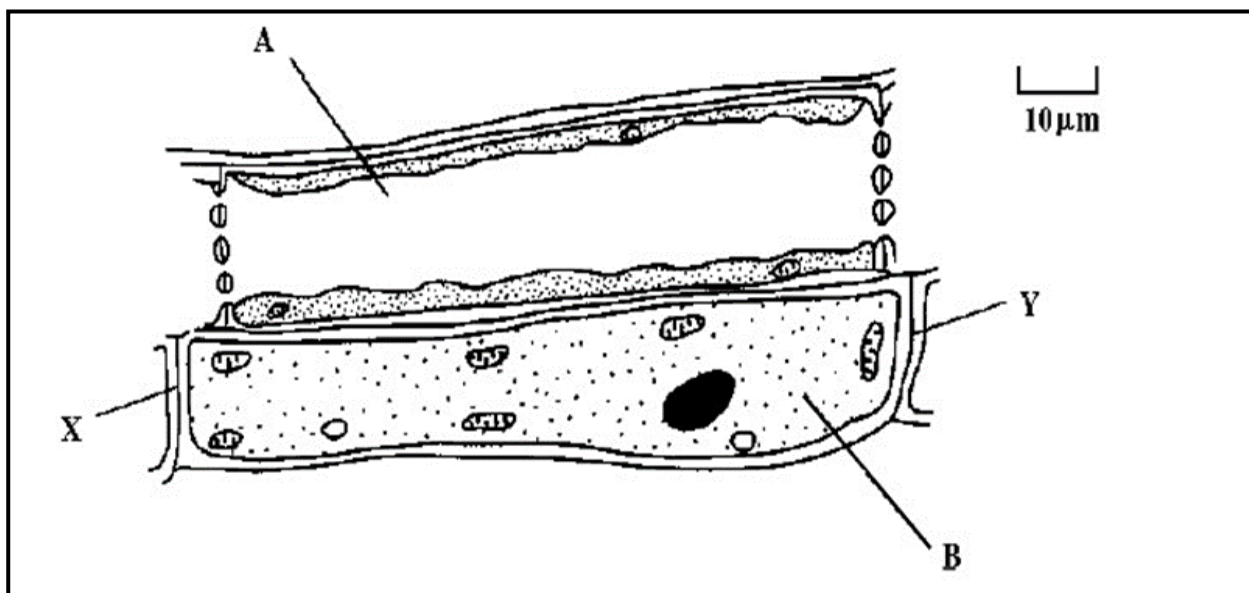
(2)

- 2.4 Mention ONE way in which the investigator can decrease the time taken for the level of water in the glass beaker to change. (1)
- 2.5 Explain the changes that were observed in the levels of sugar solution in the and water during the investigation. (4)

TOTAL QUESTION 2: (9)

QUESTION 3

3. The diagram below represents two cells from phloem tissue.



- 3.1 Identify the TWO cell types (A and B) shown in the diagram above. (2)
- 3.2 State one function of phloem tissue. (1)
- 3.3 Calculate the actual length of cell B between points X and Y. Show all your workings. (3)
- 3.4 There are two types of vascular tissues found in plants, phloem tissue is one example.
- (a) Name the other type of vascular tissue. (1)
- (b) Explain TWO structural adaptations of the other vascular tissue in plants. (4)

TOTAL QUESTION 3: (10)

TOTAL SECTION (20)

GRAND TOTAL (30)



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UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

GRADE: 10

DATE:

DURATION: 30 minutes

TASK: TEST 2

TOTAL MARKS: 30

TOPIC/S: DIFFUSION AND OSMOSIS; PLANT TISSUES

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer **ALL** the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. Draw **ALL** diagrams in pencil and label in blue or black ink.
4. Write neatly and legibly

SECTION A

Question 1

- 1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.3) in your ANSWER BOOK, for example 1.1.4 D.

- 1.1.1 The movement of large molecules against a concentration gradient is known as...

- A random movement
- B active transport
- C dynamic movement
- D passive transport

1.1.2 Plant tissue that has walls which are unevenly thickened.

- A Collenchyma
- B Sieve tubes
- C Sclerenchyma
- D Parenchyma

1.1.3 The rate of transpiration in a plant will decrease on a...

- A hot, windy day
- B hot, dry day
- C windy, cold day
- D rainy day

(3 x 2) **(6)**

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.4) in your ANSWER BOOK.

1.2.1 A group of similar cells adapted for a particular function.

1.2.2 Parenchyma cells that contain chloroplasts.

1.2.3 The meristematic tissue responsible for secondary thickening in dicotyledonous plants.

1.2.4 Vascular tissue that is responsible for transporting dissolved nutrients in a plant.

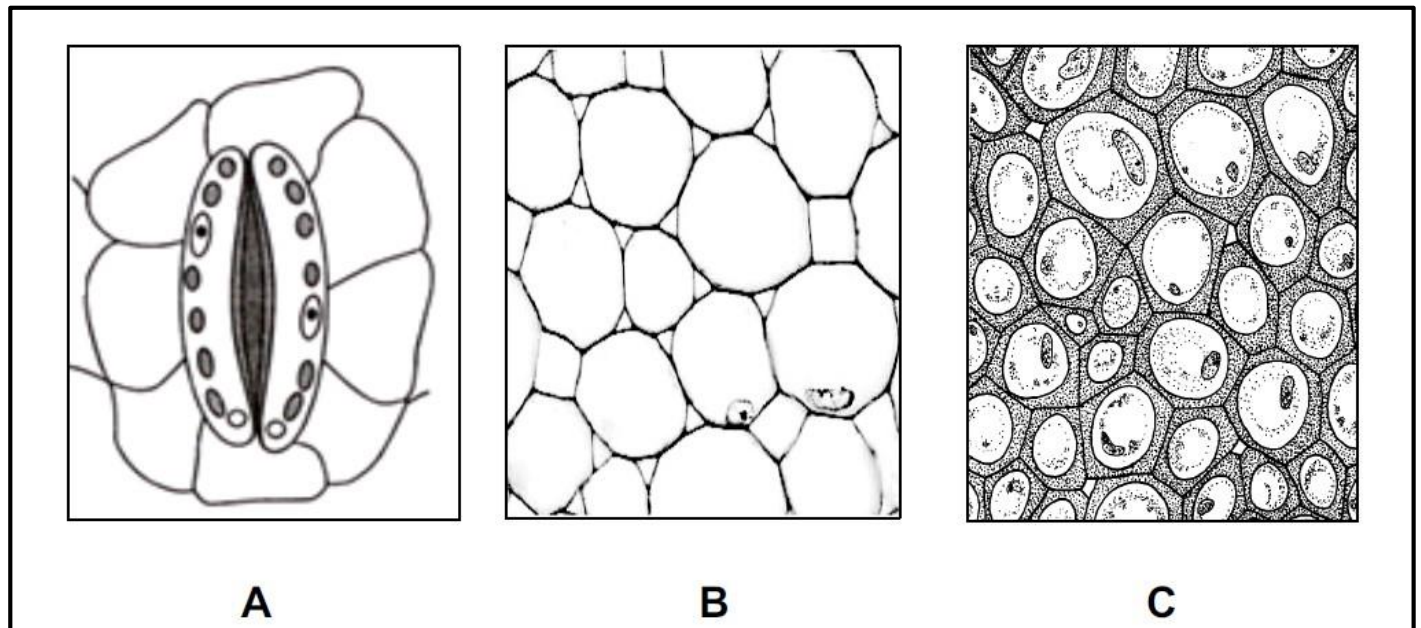
(4 x 1) **(4)**

TOTAL SECTION A: (10)

SECTION B

Question 2

- 2.1 Study the diagrams below showing different types of plant tissues and answer the questions that follow.



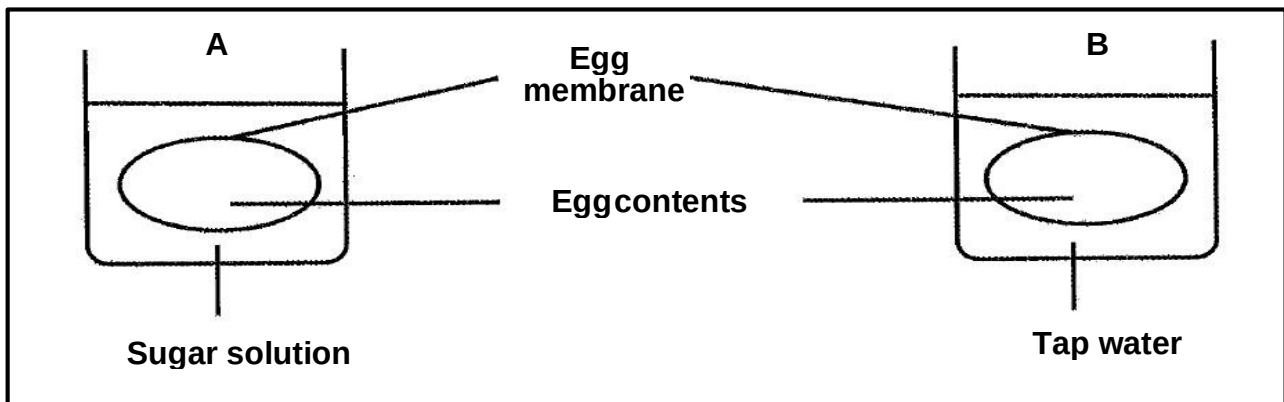
- 2.1.1 Identify tissues **B** and **C**. (2)
- 2.1.2 Explain **ONE** structural adaptation of tissue **A** to carry out its function efficiently. (2)
- 2.1.3 Explain why tissue **C** would not be suitable as the main tissue in the root between the epidermis and xylem. (2)
- 2.1.4 Tissue **B** also lines the root where it plays a role in increasing the surface area for the absorption of water. (4)
- Draw a fully labelled diagram of Tissue **B** with a root hair. (4)

(10)

QUESTION 3

3.1 The following steps were followed during an investigation as shown in the diagram below:

- The shell was removed from 2 eggs.
- The 2 resulting egg cells surrounded by a cell membrane were used in the investigation.
- Egg cell **A** was placed in a beaker containing sugar solution.
- Egg cell **B** was placed in a beaker containing tap water.



- 3.1.1 Identify the process that is being investigated. (1)
- 3.1.2 Define the process identified in **QUESTION 3.1.1**. (2)
- 3.1.3 Cell B is expected to be larger after 2 days.
Explain why this happens. (2)
- 3.1.4 Explain why it was necessary to remove the shell from the egg for this experiment. (2)
- 3.1.5 What would happen if the egg cell from beaker **B** was removed after the 2 days and placed into beaker **A**? (1)
- 3.1.6 List any TWO factors that should be kept constant in this investigation. (2)

(10)

TOTAL SECTION B: (20)

GRAND TOTAL: (30)



education

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UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

GRADE: 10

DATE:

DURATION: 30 minutes

TASK: TEST 3

TOTAL MARKS: 30

TOPIC/S: DIFFUSION AND OSMOSIS; PLANT TISSUES

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer **ALL** the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. Draw **ALL** diagrams in pencil and label in blue or black ink.
4. Write neatly and legibly

SECTION A

Question 1

- 1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.3) in your ANSWER BOOK, for example 1.1.4 D.

1.1.1 Plant tissue that is found at the tips of roots and the tips shoots and is actively dividing by mitosis.

- A Collenchyma
- B Meristematic
- C Epidermis
- D Xylem

1.1.2 The pathway that water takes as it moves along the root is...

- A epidermis → cortex → endodermis → pericycle
- B epidermis → endodermis → cortex → pericycle
- C epidermis → pericycle → passage cell → cortex
- D root hair → cortex → pericycle → endodermis

1.1.3 The guard cells in the epidermis of a leaf differ from the other epidermal cells in that they ...

- A have a nucleus
- B have thin cell walls
- C have chloroplasts
- D have vacuoles

(3 x 2)

(6)

- 1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.4) in your ANSWER BOOK.

1.2.1 The movement of particles from a region of high concentration to a region of low concentration.

1.2.2 The substance that forms the thickened rings in the walls of xylem vessels.

1.2.3 The smaller, tapered, pitted cells found in xylem.

1.2.4 The packaging and storage tissue in plants.

(4 x 1)

(4)

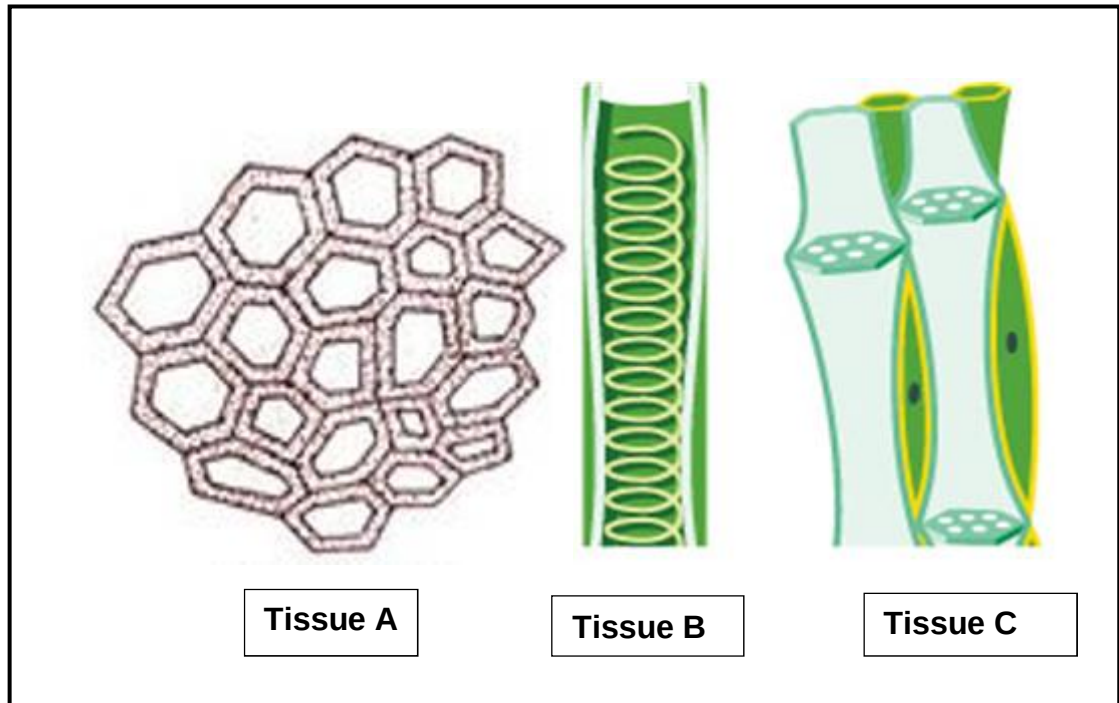
TOTAL SECTION A:

(10)

SECTION B

Question 2

2. The diagrams below represent three different plant tissues.



- 2.1 Identify tissues A and C respectively. (2)
- 2.2 State the LETTERS of the tissues that...
- (a) transport dissolved food in the plants (1)
 - (b) consists of dead cells and are strengthening tissues (2)
- 2.3. State the main function of tissue B. (1)
- 2.4 Explain TWO adaptations that make it suitable for the function mentioned in question 2.3.1 above. (4)
- (5)

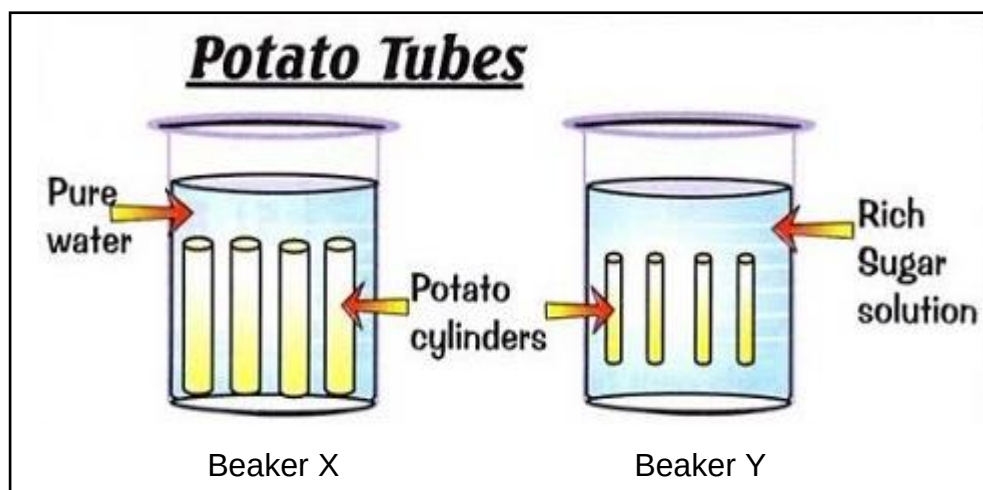
TOTAL QUESTION 2: (10)

QUESTION 3

3.1 An investigation was carried out by Grade 10 Life Sciences learners to demonstrate osmosis in living cells as follows:

- A potato was cut into 8 equal cylinders
- 4 cylinders were placed into beaker X and 4 cylinders were placed into beaker Y as shown in the diagram below.
- Beaker X was filled with pure water and Beaker Y was filled with a rich concentrated sugar solution.

The diagrams below represent the process of osmosis in plant tissues.



3. 1 Identify the solution that would have a higher water potential? (1)
- 3.2 Give a reason for your answer in QUESTION 3.1.1. (2)
3. 3 Explain the results expected after a few hours in Beaker Y. (3)
- 3.4 List THREE variables that should be kept the same in the above experiment to ensure validity. (3)
- 3.5 List TWO ways in which the reliability of this experiment can be improved. (2)
- (10)

TOTAL SECTION B: (20)

GRAND TOTAL: (30)



UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

GRADE: 10

DATE:

DURATION: 30 minutes

TASK: TEST

TOTAL MARKS: 30

TOPIC/S: TRANSPORT IN HUMANS

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

5. Answer **ALL** the questions.
6. Number the answers correctly according to the numbering system used in this question paper.
7. Draw **ALL** diagrams in pencil and label in blue or black ink.
8. Write neatly and legibly

SECTION A

Question 1

- 1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.3) in your ANSWER BOOK, for example 1.1.4 D.

1.1.1 Which one of the following blood vessels carries oxygenated blood?

- A Pulmonary artery
- B Superior vena cava
- C Inferior vena cava
- D Pulmonary veins

1.1.2 The smallest type of blood vessel is the ...

- A Vein
- B Venule
- C Capillary
- D Artery

1.1.3 The protective sac around the heart is the ...

- A Pericardium
- B Pleuron
- C Renal capsule
- D Endocardium

(3 x 2)

(6)

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.4) in your ANSWER BOOK.

1.2.1 The valve found in between the left ventricle and aorta.

1.2.2 The structure that prevents oxygenated and deoxygenated blood from mixing.

1.2.3 Pacemaker found in the right atrium wall.

1.2.4 The cellular component of blood that forms blood clots

(4 x 1)

(4)

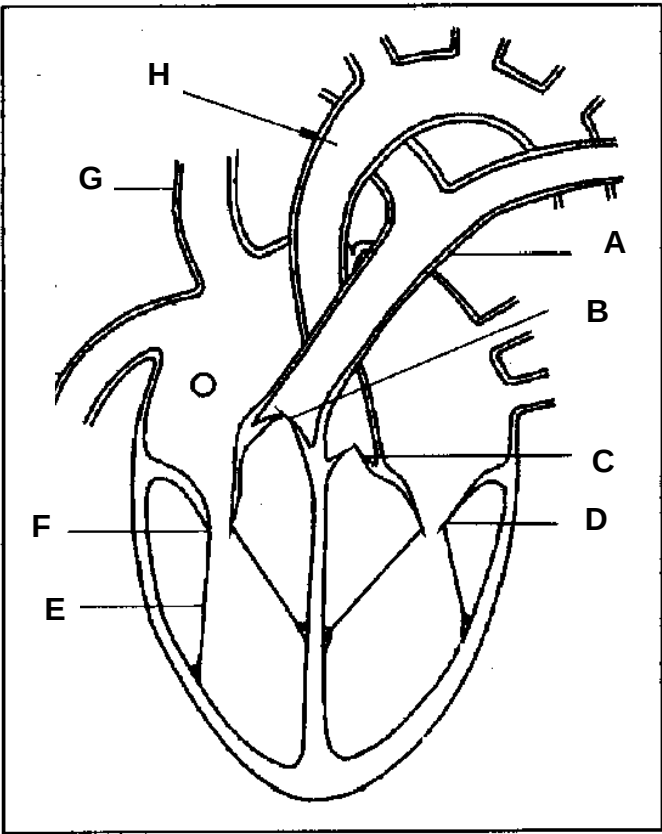
TOTAL SECTION A:

(10)

SECTION B

Question 2

2.1 The diagram below represents the parts of the human heart.



2.1.1	Identify the parts labelled A, G and H.	(3)
2.1.2	Give the letters of the valves that prevent the backflow of deoxygenated blood.	(2)
2.1.3	Describe pulmonary circulation.	(5) (10)
2.2		
2.2.1	Tabulate TWO structural differences between an artery and a vein.	(5)
2.2.2	Describe the path of blood from the pulmonary veins to the head.	(5) (10)
TOTAL SECTION B:		(20)
GRAND TOTAL		(30)

GRADE 11 TASKS

1. Assignments
2. Topic Tests



education

Department:
Education
PROVINCE OF KWAZULU-NATAL

UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

GRADE: 11

DATE:

DURATION: 60 minutes

TASK: ASSIGNMENT

TOTAL MARKS: 50

TOPIC/S: PLANT DIVERSITY AND ANIMAL DIVERSITY

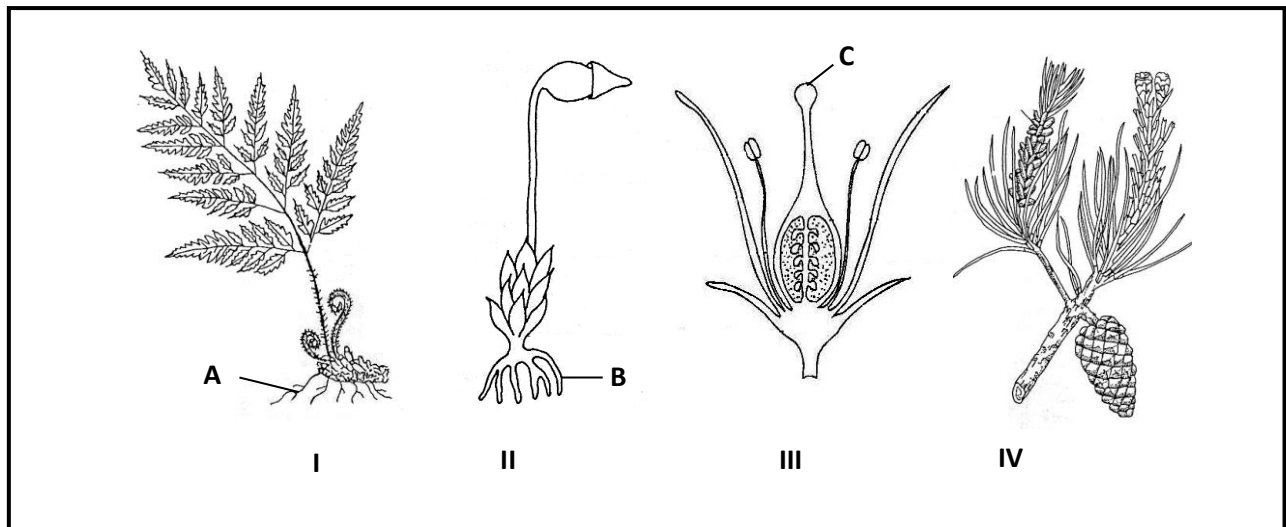
INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This is a formal SBA task and needs to be done under supervised conditions in the classroom.
2. Each learner completes this task on his/her own (under test conditions).
3. Answer **ALL** the questions.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Draw **ALL** diagrams in pencil and label in blue or black ink.
6. Write neatly and legibly

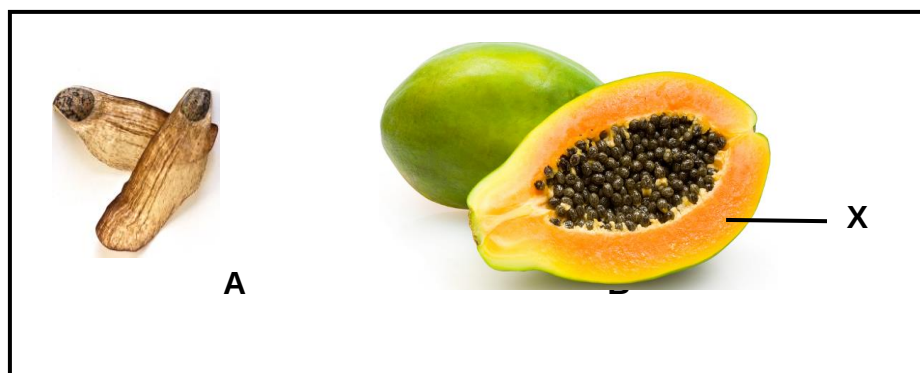
Question 1

- 1.1 Study the following diagrams of different plant groups and answer the questions that follow.



- 1.1.1 Identify plant group **I** and **IV** respectively. (2)
- 1.1.2 Give labels **A**, **B** and **C** respectively. (3)
- 1.1.3 State only the NUMBER of the plant group which:
- (a) has no vascular tissue. (1)
 - (b) is pollinated by birds. (1)
 - (c) bears fruit. (1)
- (8)

- 1.2 The photographs below show two different types of seeds.



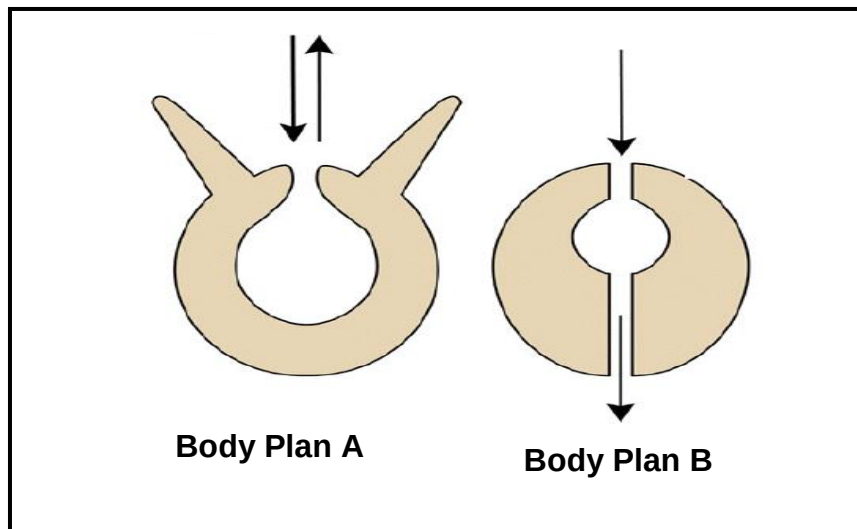
- 1.2.1 State the division to which all seed-producing plants belong. (1)
- 1.2.2 Which seeds, A or B, are produced by a gymnosperm? (1)
- 1.2.3 Name the part of the flower that developed into the:
- (a) fleshy fruit labelled X. (1)
 - (b) seeds. (1)

- 1.2.4 Explain ONE way in which the seeds in A are structurally adapted for dispersal. (2)
- 1.2.5 Explain TWO reasons why the production of seeds is an advantage for terrestrial plant, (4)
(10)

TOTAL QUESTION 1: (18)

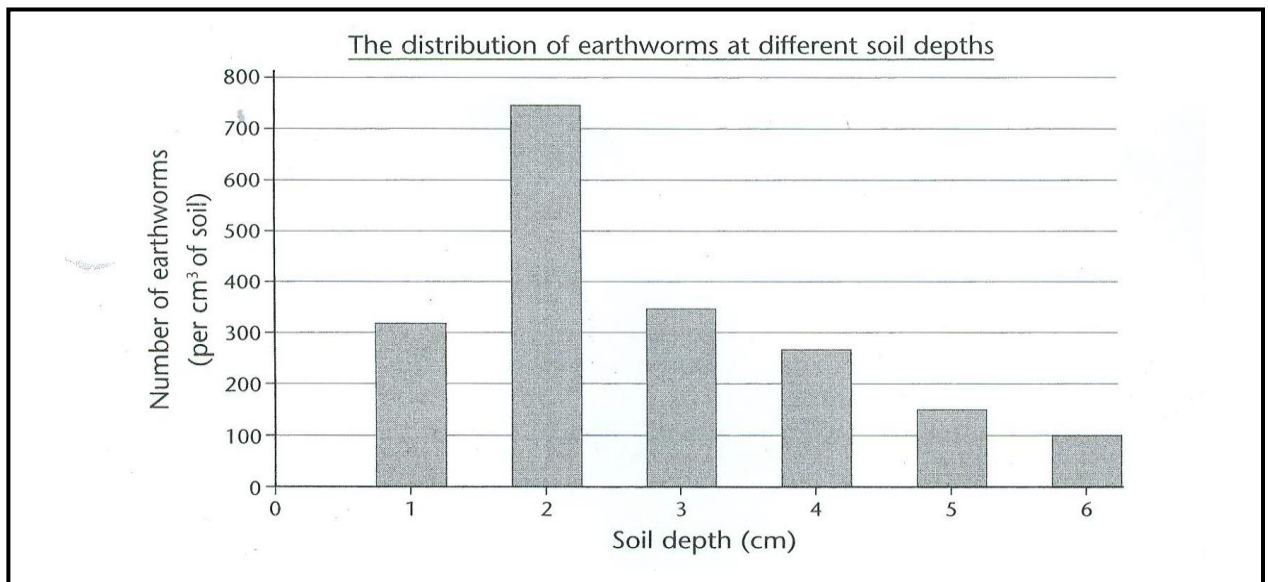
Question 2

- 2.1 Below are pictures showing two body plans with different digestive tracts. Study the diagrams and then answer the questions that follow.



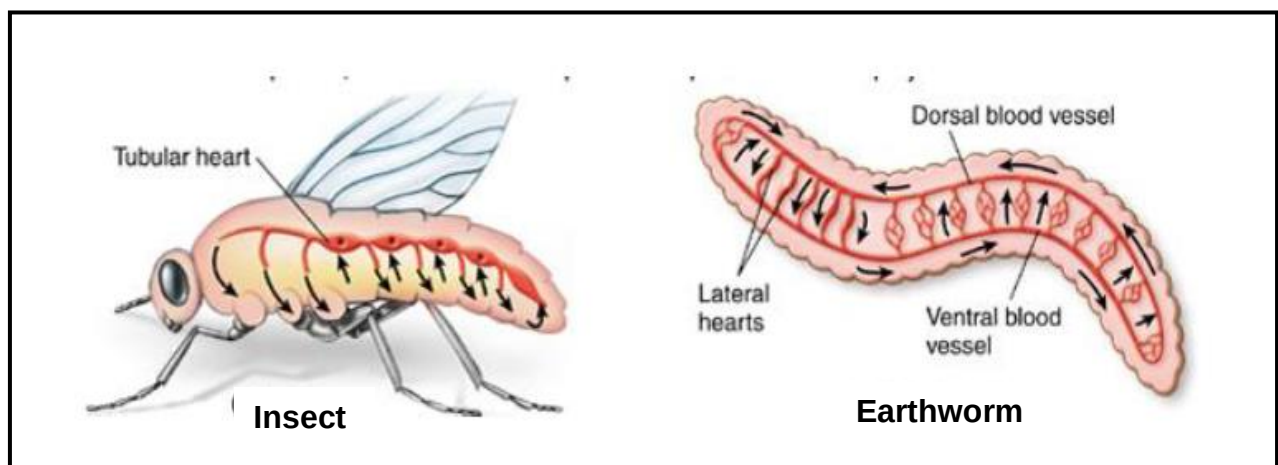
- 2.1.1 Name the type of digestive system found in organisms with body plans A and B. (2)
2. 1.2 Explain ONE advantage of the digestive system of body plan B. (2)
- 2.1.3 Explain ONE difference the presence of a coelom makes to the digestive system in animals with body plan B. (2)
(6)

- 2.2 Study the bar graph below which shows the distribution of earthworms in the soil and then answer questions that follow.



- 2.2.1 Name the phylum to which the earthworms belong. (1)
- 2.2.2 At what soil depth are most earthworms found? (1)
- 2.2.3 State TWO reason why earthworms are most commonly found at the depth mentioned in QUESTION 2.2.2 above. (2)
- 2.2.4 State TWO ecological roles that earthworms play in the soil. (2)
- (6)**

- 2.3 Below are pictures showing the circulatory systems of two organisms. They are respectively classified under the phyla Arthropoda (bee/insect) and Annelida (earthworm). Study the diagrams and answer the questions that follow.



- 2.3.1 Name the cavity into which blood flows in the insects. (1)

- 2.3.2 Name the type of circulation system found in an earthworm. (1)
- 2.3.3 Explain ONE advantage the earthworm's type of circulation system has over the insect's type of circulation system. (2)
- 2.3.4 State **ONE** important role of bees in an ecosystem. (1)
(5)

TOTAL QUESTION 2: (17)

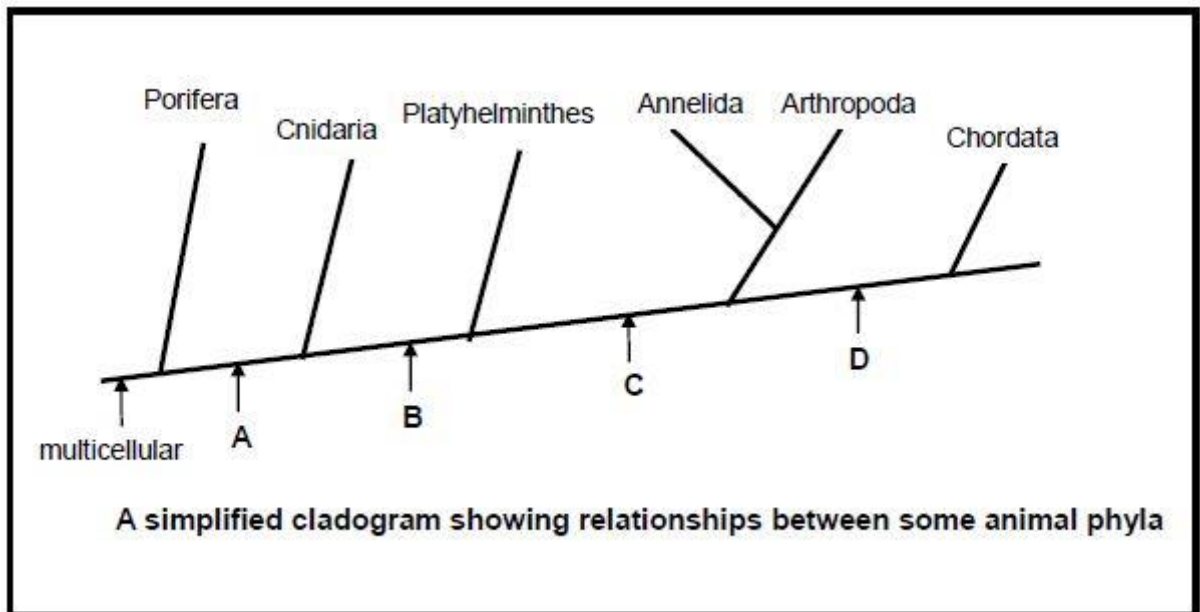
Question 3

- 3.1 Study the table below showing the approximate numbers of species in some animal phyla, and then answer the questions that follow.

Phylum	Number of described species
Annelida	17 000
Arthropoda	1 134 000
Chordata	121 000
Cnidaria	11 000
Platyhelminthes	25 000
Porifera	5 000

- 3.1.1 Name the phylum that ...
- (a) has the **least** number of species. (1)
- (b) has the greatest biodiversity. (1)
- 3.1.2 Calculate how many **more** species of Platyhelminthes there are than Annelida.
Show your calculations (2)
- 3.1.3 Draw a bar graph to represent the data in the table above. (6)
(10)

- 3.2 The diagram below represents a cladogram (phylogenetic tree) showing relationships between animal phyla. The letters **A – D**, represent the characteristics which are shared by all the phyla of animals which follow the letter. The point where the phyla differ from each other is shown by the branching off into the named phyla.



- 3.2.1 Name the characteristic that is shared by all the organism in the animal kingdom according to the cladogram above. (1)
- 3.2.2 Identify the LETTER that represents each of the following characteristics with respect to body plan. (1)
- (a) Cephalization. (1)
- (b) Triploblastic. (1)
- 3.2.3 State the names of the phyla that show the characteristic represented by **C**. (2)

(5)

TOTAL QUESTION 3: (15)

GRAND TOTAL: (50)



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Department:
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UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

GRADE: 11

DATE:

DURATION: 60 minutes

TASK: ASSIGNMENT

TOTAL MARKS: 50

TOPIC/S: PHOTOSYNTHESIS AND CELLULAR RESPIRATION

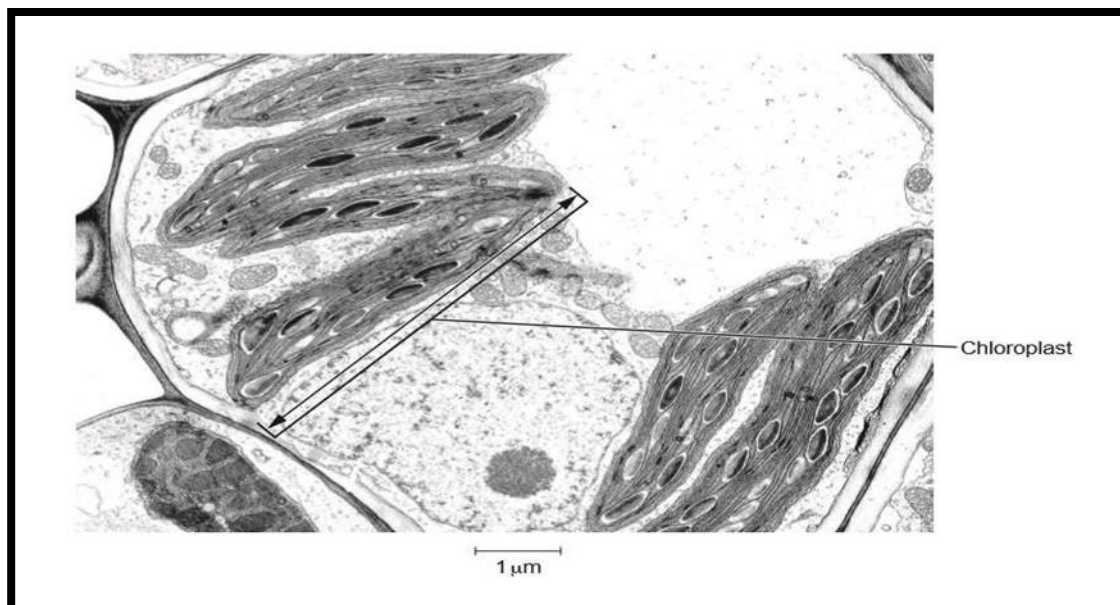
INSTRUCTIONS AND INFORMATION

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5. Draw **ALL** diagrams in pencil and label in blue or black ink.
6. Write neatly and legibly

Question 1

1. Study the diagram below and answer questions that follow.



- 1.1 Calculate the length of the chloroplast using the arrow and the scale on the diagram. (3)
- 1.2 Complete the chemical equation for photosynthesis:
..... + ... $\longrightarrow$ Glucose + ... (3)
- 1.3 Photosynthesis takes place inside chloroplasts.
Draw a labelled diagram of this organelle in the leaves of plants. (4)

TOTAL QUESTION 1: (10)

Question 2

2. Read the extract below and answer questions that follow.

Cellular respiration is the process in which cells use oxygen to produce ATP. During exercise, muscles cells have to work harder which increases their demand for oxygen and thus breathing and heart rate increases to help increase the oxygen in the blood stream. During high-speed athletics, the oxygen supply is less than the demand therefore muscles begin converting glucose into lactic acid instead of energy. At the end of the race, athletes have to breathe deeper and faster.

Aerobic and anaerobic respiration are used to supply energy during exercise.

During certain types of exercise, for example, athletic events such as 100m, 200m, 1500m and 3000m the muscles are unable to obtain sufficient oxygen for the removal of large quantities of lactic acid from their cells. When sprinting, an athlete cannot possibly inhale more than the fraction of the oxygen required, and the body goes into 'oxygen debt'. 'Oxygen debt' can be defined as the extra oxygen needed to normalize the process after strenuous exercise. This debt can only be repaid by rapid breathing after the sprint ends.

- 2.1 Name:
- (a) the type of cellular respiration, which does not rely on oxygen to take place. (1)
 - (b) **TWO** end products of aerobic respiration in muscle cells of animals. (2)
 - (c) the athletic event that relies the most on anaerobic respiration. (1)
- 2.2 Explain your answer to QUESTION 1.1(c) above. (2)
- 2.3 Describe what happens to the energized hydrogen atoms released during aerobic respiration. (5)
- 2.4 An athlete runs very fast for 200m then he stops running. His breathing rate and heart rate remain high for several minutes.
- Explain why this happens. (2)
- 2.5 Tabulate TWO differences between aerobic and anaerobic respiration. (5)

TOTAL QUESTION 2: (18)

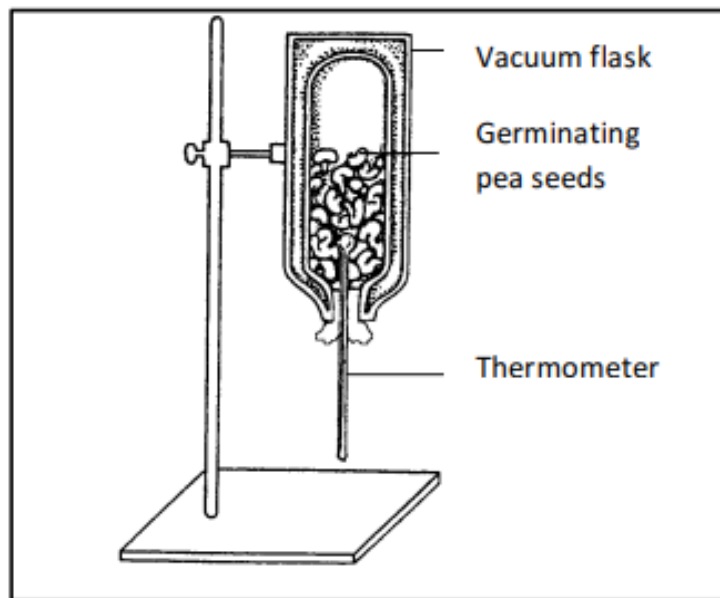
Question 3

3. An investigation was carried out to find out if living organisms give off heat energy during cellular respiration.

The procedure followed was:

- 120 pea seeds were used.
- The pea seeds were divided into 3 groups of 40 seeds and then treated as follows:
 - **Flask A:** 40 pea seeds were soaked in water at 18°C for 24 hours, then placed in a sterilized vacuum flask.
 - **Flask B:** 40 pea seeds were soaked in water at 18°C for 24 hours, boiled, cooled to 18 °C and then placed in a sterilized vacuum flask.
 - **Flask C:** 40 pea seeds were soaked in water at 18°C for 24 hours, washed with a very mild disinfectant, and then placed in the sterilized vacuum flask.

The set-up of the flasks is shown in the diagram below.



The temperatures inside the three flasks (A, B and C) were observed every 12 hours for three days and recorded in a table below:

Time (Hours)	Flask A (°C)	Flask B (°C)	Flask C (°C)
0	18	18	18
12	26	18	20
24	40	18	23
36	48	18	26
48	50	18	29
60	52	18	33
72	54	18	40

- 3.1 For this investigation state the:
- (a) independent variable (1)
- (b) dependent variable (1)
- 3.2 Draw a line graph to show the results obtained in flask C. (6)
- 3.3 State ONE way in which the reliability of the investigation can be improved. (1)
- 3.4 Identify TWO factors that were kept constant in this investigation. (2)
- 3.5 Explain the results in Flask C. (3)
- 3.6 Explain ONE reason for:
- (a) soaking the pea seeds in water before placing them in the flasks. (2)
- (b) the greater rise in temperature in Flask A compared to Flask C. (2)
- (c) the absence of any increase in temperature in Flask B. (2)
- (d) the inclusion of Flask B in the investigation. (2)

TOTAL QUESTION 3: (22)

GRAND TOTAL: (50)



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UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

GRADE: 11

DATE:

DURATION: 60 minutes

TASK: ASSIGNMENT

TOTAL MARKS: 50

TOPIC/S: PHOTOSYNTHESIS AND ANIMAL NUTRITION

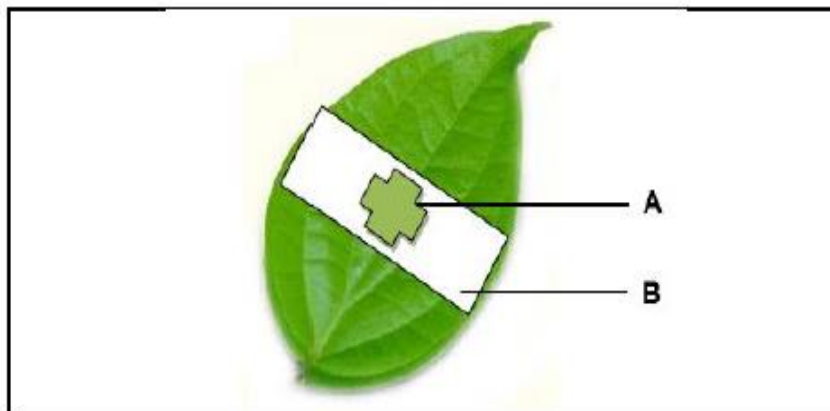
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5. Draw **ALL** diagrams in pencil and label in blue or black ink.
6. Write neatly and legibly

Question 1

1. The diagram below shows how the leaf on a potted destarched plant was set up by a learner to perform an investigation.



- 1.1 State the aim of this investigation. (2)
- 1.2 Name the dependent variable in this investigation (1)
- 1.3 Describe how the plant was destarched before the experiment. (2)
- 1.4 Name the indicator substance/reagent that was used to test for the presence of starch in the leaf. (1)
- 1.5 Describe why part B was covered with a cardboard card. (1)
- 1.6 Describe the colour change observed in the part of the leaf that was:
- (a) not exposed to light (part B) (1)
 - (b) exposed to light (part A) (1)
- 1.7 One of the steps in the starch test includes boiling the leaf in alcohol in a water bath.
- Describe the reason for:
- (a) boiling the leaf in alcohol (methylated spirits). (1)
 - (b) using water bath to boil the leaf in alcohol, with ALL flames extinguished. (1)

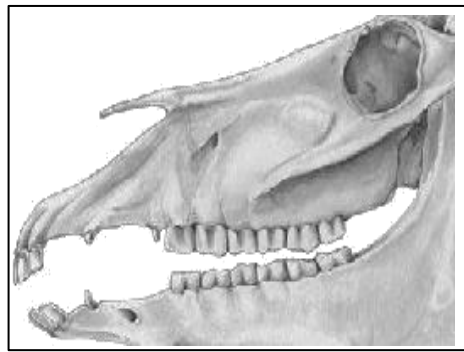
TOTAL QUESTION 1: (11)

Question 2

2.1 Study skull A and skull B below and answer the questions that follow.



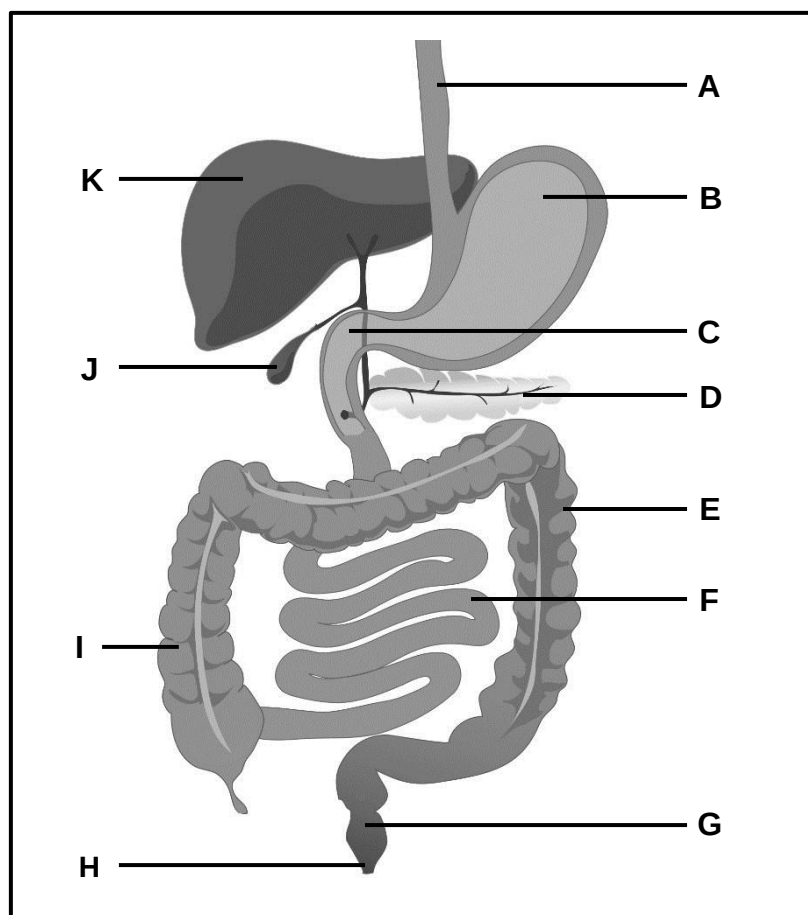
Skull A



Skull B

- 2.1.1 Identify which skull (**A** or **B**) belongs to a:
- (a) Herbivore
 - (b) Carnivore (2)
- 2.1.2 Explain ONE reason for your answer to QUESTION 1.2.1(b) above. (2)
- 2.1.3 What does dental formula represent? (2)
- 2.1.4 Name the type of digestion that teeth are involved in. (1)
- (7)**

- 2.2 Study the diagram of the human digestive system and answer the questions that follow.



2.2.1 Name the parts labelled **E, G, J and K**. (4)

2.2.2 Give the LETTER and NAME of the part that:

(a) Detects and controls blood glucose levels.

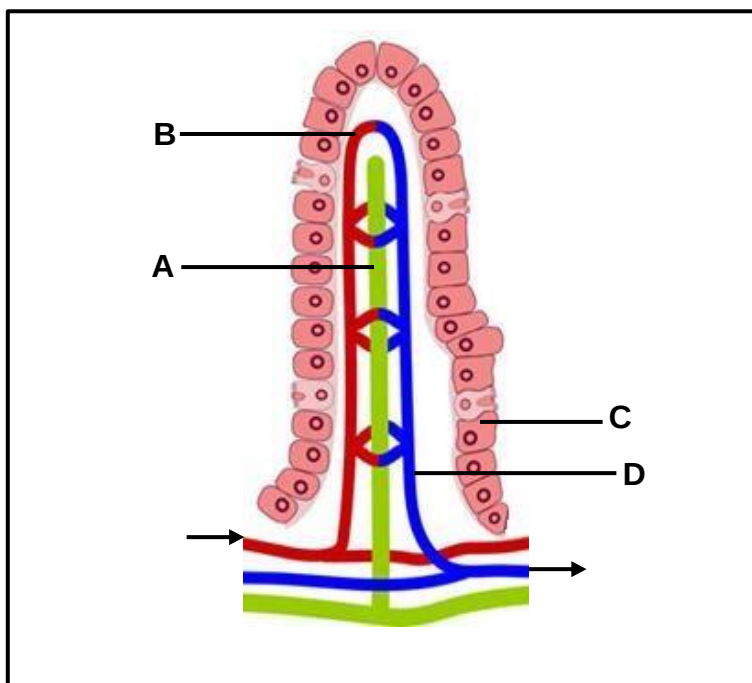
(b) Secretes hydrochloric acid. (4)

2.3 Explain FIVE adaptations of structure labelled F in its function of digestion and absorption. (10)

TOTAL QUESTION 2: (25)

Question 3

3.1 Study the diagram below and answer the questions that follow.



3.1.1 Identify the structure represented by the diagram above. (1)

3.1.2 Name the parts labelled **A**, **B** and **C** (3)

3.1.3 Identify structures that are found on cells labelled **C**. (1)

3.1.4 Give the LETTER of the part into which the following will be absorbed:

(a) glucose and amino acids

(b) fatty acids and glycerol (2)

3.1.5 Name the process which assists in absorption of glucose and amino acids in the structure shown above. (1)

(8)

3.2 Explain THREE adaptations of the structure represented above. (6)

TOTAL QUESTION 3: (14)

GRAND TOTAL: (50)



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UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

GRADE: 11

DATE:

DURATION: 30 minutes

TASK: TEST 1

TOTAL MARKS: 30

TOPIC/S: PHOTOSYNTHESIS

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer **ALL** the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
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4. Write neatly and legibly

SECTION A

Question 1

- 1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.3) in your ANSWER BOOK, for example 1.1.4 D.

1.1.1 The light phase of photosynthesis takes place ...

- A when light is absent
- B when light is present
- C during the day and at night
- D continuously

1.1.2 Which ONE of the following is a requirement in the dark phase of photosynthesis?

- A Carbon dioxide
- B Oxygen
- C Radiant energy
- D Water

1.1.3 A molecule that serves as an energy carrier during photosynthesis to help make organic molecule

- A ATP
- B NADP
- C ADP
- D NADPH

(3 x 2)

(6)

- 1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.4) in your ANSWER BOOK.

1.2.1 The splitting of water molecule to hydrogen and oxygen in presence of light

1.2.2 Opening in a leaf through which gaseous exchange takes place during photosynthesis

1.2.3 An energy-rich carbohydrate that is formed during photosynthesis

1.2.4 The phase of photosynthesis that is independent of light

(4 x 1)

(4)

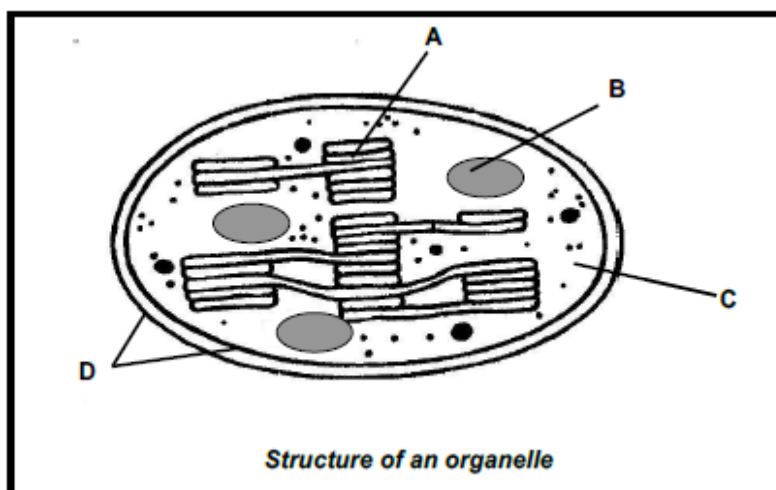
TOTAL SECTION A:

(10)

SECTION B

Question 2

2.1 Chloroplast plays an important role in photosynthesis.



2.1.1 Give the letter (A, B, C or D) of the part:

- (a) that stores the products of photosynthesis (1)
 - (b) that contains chlorophyll (1)
 - (c) where light independent phase occurs (1)
- (3)**

2.2 2.2.1 Describe the role of water as a requirement in photosynthesis. (2)

2.2.2 State ONE way in which photosynthesis is biologically important. (1)

2.2.3 Explain why a continuous increase in carbon dioxide level will not cause the rate of photosynthesis increase continuously. (4)

(7)

TOTAL QUESTION 2: (10)

Question 3

An investigation was conducted to determine the effect of light intensity on the rate of photosynthesis.

The distance between the light source (lamp) and the apparatus (with water plant) was changed at regular intervals, recording the number of bubbles released by the water plant at each distance.

The results are shown in the table below:

Distance between lamp and plant (mm)	40	80	120	160	200	240	280	320	360	400	440
Bubbles formed per minute	30	30	30	25	15	10	5	3	2	0	0

3.1 From the above investigation, state:

(a) the dependent variable (1)

(b) the independent variable (1)

3.2 Describe how the following were measured:

(a) the dependent variable (1)

(b) the independent variable (1)

3.3 Plot a line graph to represent the data obtained during this investigation. (6)

TOTAL QUESTION 3: (10)

TOTAL SECTION B: (20)

GRAND TOTAL: (30)



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UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

GRADE: 11

DATE:

DURATION: 30 minutes

TASK: TEST 2

TOTAL MARKS: 30

TOPIC/S: PHOTOSYNTHESIS

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer **ALL** the questions.
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4. Write neatly and legibly

SECTION A

Question 1

- 1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.3) in your ANSWER BOOK, for example 1.1.4 D.

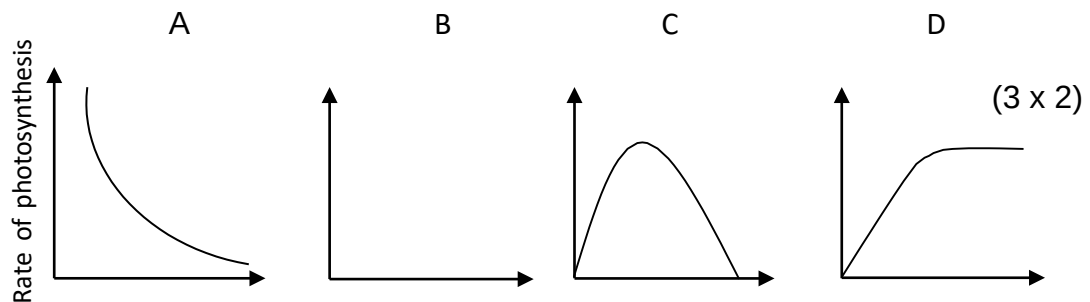
1.1.1 The light phase of photosynthesis takes place ...

- A when light is absent
- B when light is present
- C during the day and at night
- D continuously

1.1.2 Which ONE of the following is a requirement in the dark phase of photosynthesis?

- A Carbon dioxide
- B Oxygen
- C Radiant energy
- D Water

1.1.3 Which ONE of the following graphs (A-D) represents the relationship between light intensity and the rate of photosynthesis most accurately?



(6)

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.4) in your ANSWER BOOK.

- 1.2.1 The phase of photosynthesis that is independent of light.
- 1.2.2 Openings in a leaf through which gaseous exchange takes place during photosynthesis.
- 1.2.3 An energy-rich carbohydrate that is formed during photosynthesis
- 1.2.4 A molecule that serves as an energy carrier during photosynthesis to help make organic molecules.

(4 x 1)

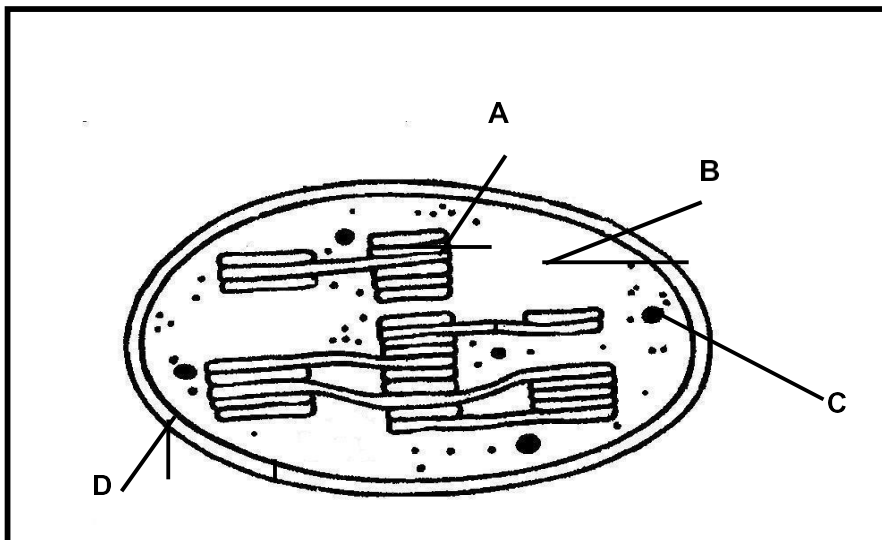
TOTAL SECTION A:

(4)
(10)

SECTION B

Question 2

2.1 The diagram below represents a chloroplast, the site for photosynthesis.



2.1.1 Give the LETTER and NAME of the part:

- (a) that stores the product of photosynthesis. (2)
- (b) where carbon dioxide is used. (2)

2.1.2 Describe the role of water as a requirement in photosynthesis. (2)

(6)

- 2.2 The passage below relates to the agricultural use and manipulation of the factors that affect the rate of photosynthesis.

THE AGRICULTURAL USE OF THE FACTORS

Flowers, fruits and vegetables can all be grown in plastic tunnels or greenhouses. The farmers use these structures to regulate the light intensity, temperature and carbon dioxide concentration.

Artificial lighting in greenhouses increases the light intensity. The glass or plastic walls of the greenhouses trap the heat of the sun within the structures, thereby raising the temperature. Carbon dioxide concentration of the air within the structure is increased by pumping carbon dioxide into the structure.

This ensures that plants grow as fast as possible and maximize the crop yield.

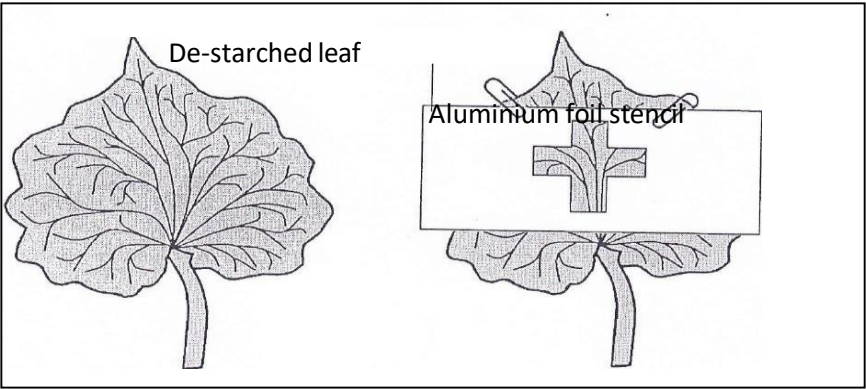
- 2.2.1 Name ONE limiting factor of photosynthesis that is mentioned in the passage. (1)
- 2.2.2 Explain why a continuous increase in carbon dioxide levels will **not** cause the rate of photosynthesis to increase continuously. (3)
- (4)
- TOTAL QUESTION 2: (10)**

Question 3

- 3.1 An investigation was conducted to find out whether light is necessary for photosynthesis.

The procedure followed is given below.

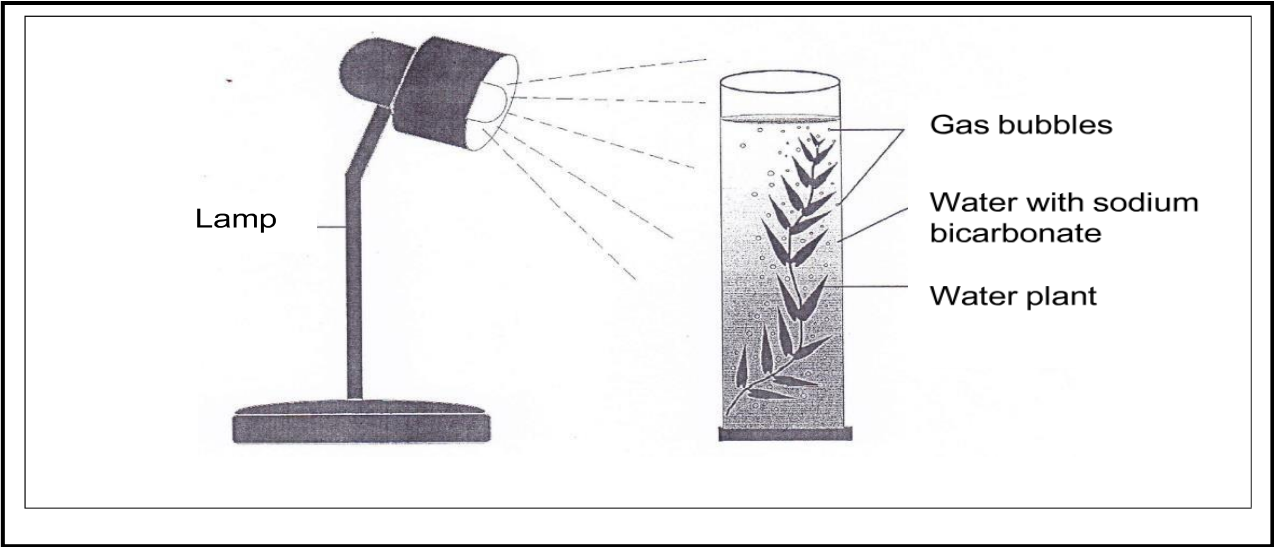
- A geranium potted plant was de-starched by placing it in a dark cupboard for 48 hours.
- A cross-shaped light-slit was cut out on aluminium foil.
- The aluminium foil stencil was then clipped onto one of the de-starched leaves, as shown in the diagram below.
- The potted plant was exposed to bright sunlight for 5 hours.
- After 5 hours, the aluminium foil stencil was removed, and the leaf was tested for starch.



3.1.1 Describe the steps, in the correct sequence, that were followed during the starch test. (4)

3.1.2 Draw a labelled diagram of the leaf showing the result of the investigation. Use a pencil and shade the parts which tested positive for starch. (3)
(7)

3.2 The apparatus shown below was used in an investigation to determine the effect of light intensity on the rate of photosynthesis.



The distance between the light source (lamp) and the apparatus with a water plant) was changed at regular intervals, recording the number of bubbles released by the water plant at each distance.

The results are shown in the table below.

Distance between lamp and plant (mm)	40	80	120	160	200	240	280	320	360	400	440
Bubbles formed per minute	30	30	30	25	15	10	5	3	2	0	0

3.2.1 Name the dependent variable in the above investigation. (1)

- 3.2.2 State ONE way in which the reliability of the investigation could be increased. (1)
- 3.2.3 State the function of sodium bicarbonate in this investigation. (1)
(3)
- TOTAL QUESTION 3: (10)**
- GRAND TOTAL: (30)**



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PROVINCE OF KWAZULU-NATAL

UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

GRADE: 11

DATE:

DURATION: 30 minutes

TASK: TEST

TOTAL MARKS: 30

TOPIC/S: CELLULAR RESPIRATION

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer **ALL** the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. Draw **ALL** diagrams in pencil and label in blue or black ink.
4. Write neatly and legibly

SECTION A

Question 1

- 1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.7) in your ANSWER BOOK, for example 1.1.4 D.

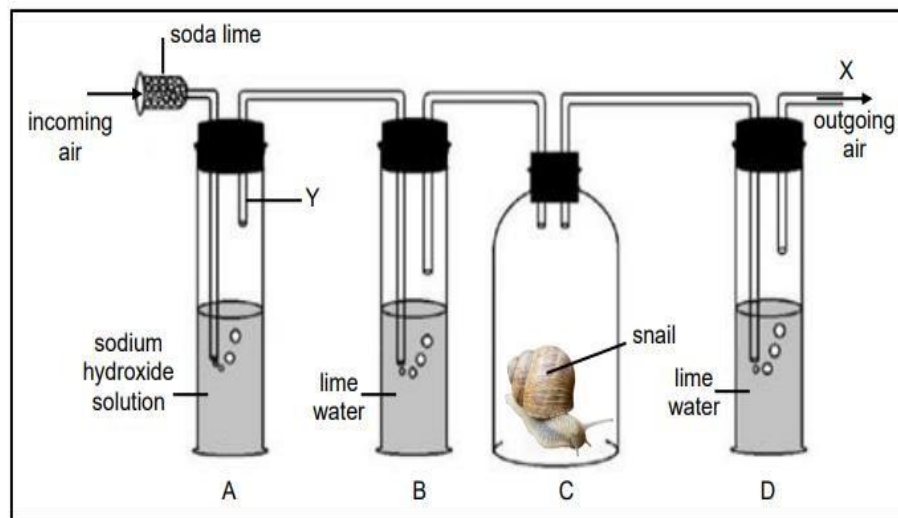
1.1.1 The conversion of pyruvic acid into lactic acid occurs during ...

- A Photolysis
- B Glycolysis
- C Anaerobic respiration
- D Oxidation of glucose

1.1.2 A process that does **not** require oxygen to take place:

- A Krebs's cycle
- B Glycolysis
- C Oxidative phosphorylation
- D Aerobic respiration

- 1.1.3 The aim of the following investigation is to prove that carbon dioxide is produced by living organisms during respiration. Identify the correct statement about this investigation.



Experimental set-up to show CO₂ is produced during aerobic respiration

- A Both lime water at test tube D and sodium hydroxide solution at test tube A turns milky due to the carbon dioxide produced by a snail.
- B Sodium hydroxide solution turns milky due to the carbon dioxide produced by a snail.
- C Lime water at test tube D turns milky due to the carbon dioxide produced by a snail.
- D Lime water at test tube B turns milky due to the carbon dioxide produced by a snail.

(3 x 2)

(6)

- 1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.9) in your ANSWER BOOK.

- 1.2.1 The process during which glucose is converted into pyruvic acid.
- 1.2.2 The reagent used to test for the presence of carbon dioxide.
- 1.2.3 The acid that accumulates in the muscles of humans during continuous strenuous physical activity.
- 1.2.4 The gas which is released during the Krebs's cycle.

(4 x 1)

(4)

TOTAL SECTION A:

(10)

SECTION B

Question 2

2.1 Read the information below and answer the questions that follow.

Traditional African Beer forms a very important part of African culture. It is called *umqombothi* in isiXhosa and *iJuba* in isiZulu. The beer is mostly brewed from indigenous sorghum. The thick creamy African beer is very rich in vitamin B, it has a low alcohol content of less than 3% and it is inexpensive. The recipe for brewing beer is passed down through the generations. The traditional method of testing to see if the brew is ready is to light a match close to the container of beer. If the flame dies quickly, the brew is ready. If the flames remain lit, the brew is not ready.

2.1.1 Name the biochemical process used to brew this African beer. (1)

2.1.2 Explain why the test mentioned in the above passage is an indication of whether the brew is ready or not. (2)

(3)

2.2 Tabulate TWO differences between aerobic and anaerobic respiration **(5)**

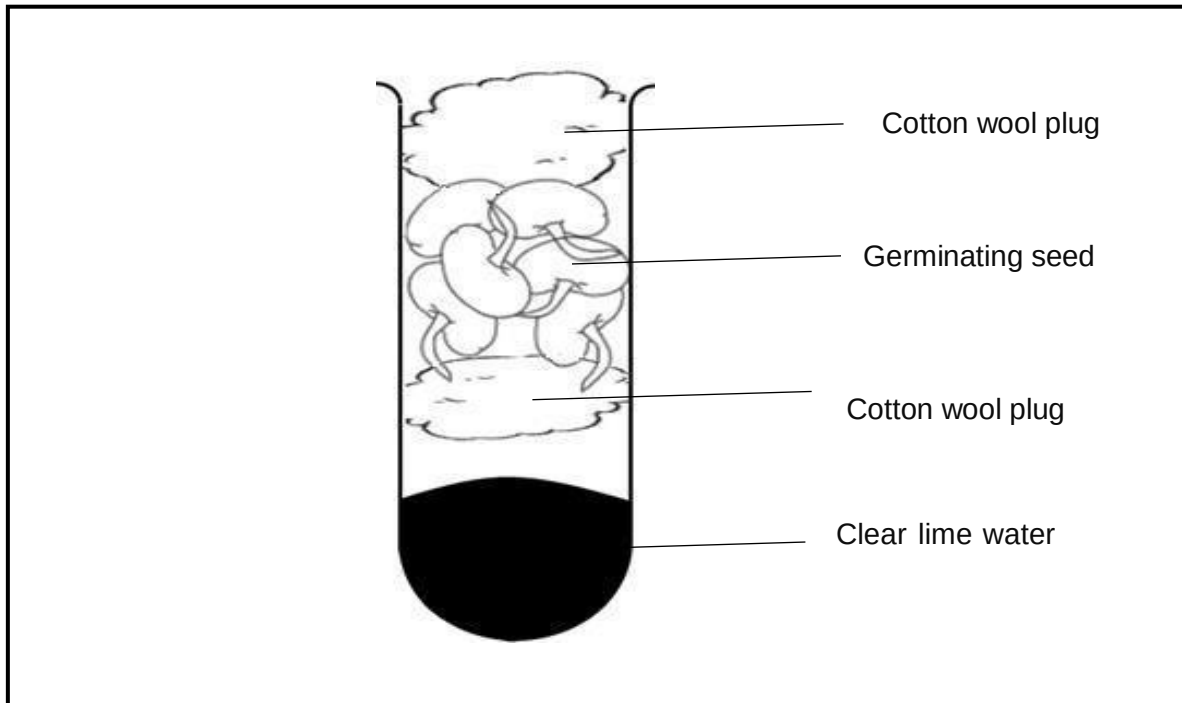
2.3 Draw the organelle in which cellular respiration takes place. **(5)**

TOTAL QUESTION 2: (13)

Question 3

3. The apparatus below was used to carry out an experiment on aerobic respiration. The experiment was set up as follows:

- Seeds of the same kind were used.
- The seeds and the apparatus were sterilised before the investigation.
- Once set up, the apparatus was placed in a dark cupboard at 35°C.
- A control was also set up.



- 3.1 State the significance of sterilizing the seeds before they are used. (1)
- 3.2 Name TWO controlled variable in this investigation. (2)
- 3.3 Describe how you would set up a control for this experiment. (1)
- 3.4 State the purpose of setting up a control experiment. (1)
- 3.5 Explain why germinating seeds were used in this investigation. (2)

TOTAL QUESTION 3: (7)

TOTAL SECTION B: (20)

GRAND TOTAL: (30)



education

Department:
Education
PROVINCE OF KWAZULU-NATAL

UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

GRADE: 11

DATE:

DURATION: 30 minutes

TASK: TEST

TOTAL MARKS: 30

TOPIC/S: ANIMAL NUTRITION

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer **ALL** the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. Draw **ALL** diagrams in pencil and label in blue or black ink.
4. Write neatly and legibly

SECTION A

Question 1

- 1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.3) in your ANSWER BOOK, for example 1.1.4 D.

1.1.1 The part of the alimentary canal where emulsification of fat occurs is the...

- A liver
- B the colon
- C the gallbladder
- D the small intestine

1.1.2 The disorder resulting from an insufficient intake of proteins in the diet.

- A Marasmus
- B Kwashiorkor
- C Bulimia
- D Obesity

1.1.3 An organic food that can be absorbed into the blood without further digestion.

- A Starch
- B Glycogen
- C Glucose
- D Fats

(3 x 2) (6)

1.2 Indicate whether each of the descriptions in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B** or **none** next to the question number (1.3.1 to 1.3.3) in the ANSWER BOOK.

	COLUMN I	COLUMN II
1.2.1	Structure which is not part of alimentary canal	A: Pancreas B: Appendix
1.2.2	Enzyme secreted by the pancreas	A: Proteases B: Carbohydrases

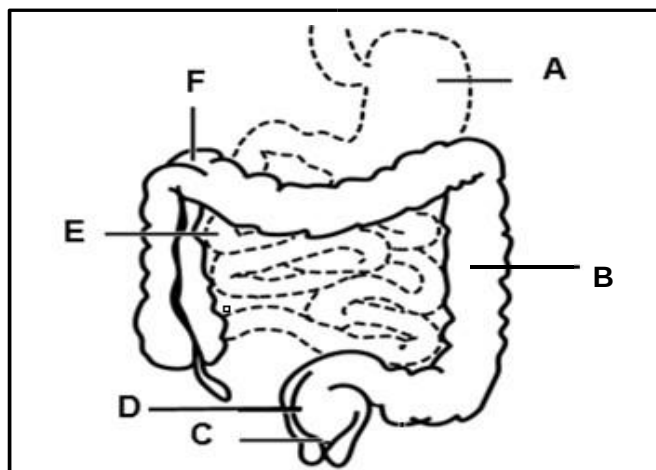
(2 x 2) (4)

TOTAL SECTION A: (10)

SECTION B

Question 2

2. Study the following diagram about a part of the human digestive system and answer the questions that follow.



2.1 Provide labels for **A** to **E**. (5)

2.2 State the LETTER that represents the part that...

- (a) absorbs most of water (1)
 - (b) produces hydrochloric acid (1)
 - (c) absorbs most of nutrients (1)
 - (d) stores undigested food materials (1)
 - (e) forms chyme (1)
- (5)**

TOTAL QUESTION 2: (10)

Question 3

3. The table below shows the nutritional information on a 360g breakfast cereal packet bought at a local supermarket.

Nutrients and energy	Average values per 30g of cereal only	Average values per 30g of cereal with 100ml of skim milk
Energy (kJ)	430	572
Protein (g)	5,0	9,0
Carbohydrates (g)	23,0	28,0
Dietary fibre (g)	4,2	4,2
Fat (g)	2,0	3,0
Sodium (mg)	110	260
Cholesterol (mg)	0	1,8

- 3.1 Calculate the amount of energy (in kJ) that is provided by 100ml of skim milk. Show all workings. (2)
- 3.2 State TWO ways in which the dietary fibre/roughage contained in the cereal is important. (2)
- 3.3 Draw a bar graph comparing the average values of proteins, carbohydrates and fats found in 30g of cereal only and in 30g of cereal with 100ml of skim milk. (6)

TOTAL QUESTION 3: (10)

TOTAL SECTION B: (20)

GRAND TOTAL: (30)

GRADE 12 TASKS

1. Practical Tasks
2. Topic Tests



education

Department:
Education
PROVINCE OF KWAZULU-NATAL

UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____

SUBJECT: LIFE SCIENCES

GRADE: 12

DATE:

DURATION: 60 minutes

TASK: PRACTICAL TASK

TOTAL MARKS: 30

TOPIC/S: GENETICS AND INHERITANCE

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

7. Answer **ALL** the questions.
8. Number the answers correctly according to the numbering system used in this question paper.
9. Draw **ALL** diagrams in pencil and label in blue or black ink.
10. Write neatly and legibly.

SKILLS ASSESSED (minimum 3)

SKILL	✓/x	SKILL	✓/x
1. Follow instructions		7.2 Hypothesising	
2. Handle equipment or apparatus		7.3 Selecting apparatus/materials	
3. Make and record observations in different ways	✓	7.4 Identifying variables	
4. Record information or data in a variety of ways	✓	7.5 Suggesting ways of controlling variables	
5. Measure		7.6 Planning an experiment	✓
6. Interpret, do calculations and represent information in different ways	✓	7.7 Suggesting ways of recording results	
7. Design / plan Investigations or experiments by: 7.1 Identifying a problem		7.8 Understanding the need for replication or verification	✓

Aim

Conduct a survey of the occurrence/frequency of dominant and recessive phenotypes for each of three traits/ characteristics (as shown in the pictures below) among the learners in your school.

This practical must be completed at school.

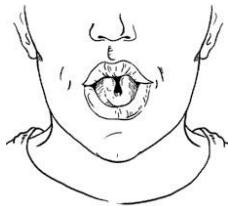
Background information

Humans inherit half of their fathers' characteristics and half of their mothers' characteristics. Inside the nucleus of each human cell there are chromosomes which carry these characteristics in the form of genes. Each gene has two alleles, or different forms of the same gene. Alleles can be dominant or recessive.

Three examples of different human characteristics are shown below.

1. The tongue:

Characteristic of a gene: The ability to roll his/her tongue.



Allele: Tongue-roller (dominant)



Allele: Non roller (recessive)

2. The ear:

Characteristic of a gene: An individual has unattached earlobes or attached earlobes.



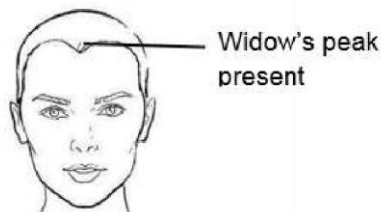
Allele: Unattached earlobe (dominant)



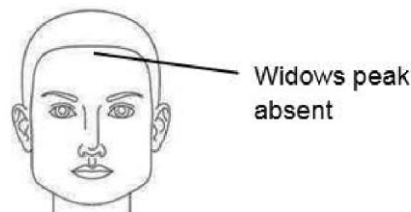
Allele: Attached earlobe (recessive)

3. The hairline:

Characteristic of a gene: An individual has a widow's peak or absence of widow's peak



Allele: The hairline shows a widow's peak (dominant)



Allele: No widows peak (recessive)

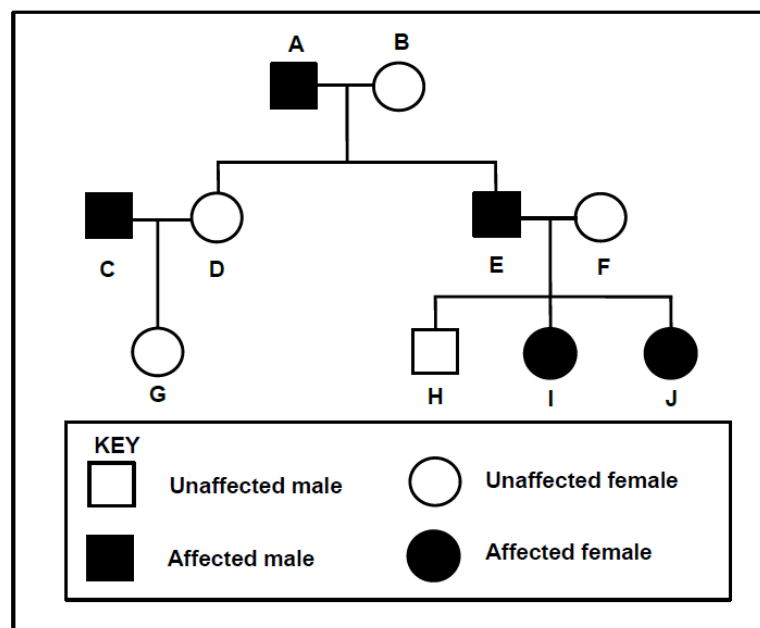
METHOD

- (a) Each select 20 learners that will form part of your sample.
- (b) Observe the different phenotypes for each characteristic.
- (c) Draw a table to record the number of learners with the different phenotypes for each characteristic.
- (d) Calculate the percentage of learners displaying each phenotype for each of the three characteristics and include them in the table. (4)

QUESTIONS

1. List any FOUR planning steps for this investigation. (4)
2. From the results obtained, state the conclusion for this investigation. (3)
3. State ONE way in which you could make the results of this investigation more reliable. (1)
4. Using the same system of axes, draw a bar graph to represent the percentage of learners displaying each phenotype for each of the three characteristics. (6)
5. Use the symbols R (tongue-roller) and r (non-roller) to represent the phenotypes and genotypes of offspring resulting from a cross between two heterozygous individuals. (6)
6. Moyamoya is a disorder caused by a dominant allele (R). This disorder damages the arteries supplying blood to the brain.

The pedigree diagram below shows the inheritance of Moyamoya in a family.



- 6.1 How many generations are represented in the diagram? (1)
- 6.2 Give the:
- (a) LETTER(S) of unaffected males. (1)
 - (b) Genotype of individuals A and F. (2)
 - (c) LETTER(S) of individuals not biologically related to A and B. (2)
- GRAND TOTAL: (30)**

CHECKLIST FOR SKILLS ASSESSED IN PRACTICAL TASK

	SKILLS AND SUB-SKILLS													
Question Number	1. Follow instructions	2. Handle equipment or apparatus	3. Make and record observations in different	4. Record information or data in a variety of	5. Measure	6. Interpret, do calculations and represent	7. Design / plan investigations or experiments by:	7.2 Hypothesising	7.3 Selecting apparatus/materials	7.4 Identifying variables	7.5 Suggesting ways of controlling variables	7.6 Planning an	7.7 Suggesting ways of recording results	7.8 Understanding the need for replication or Verification
(b)			✓											
(c)				✓										
(d)						✓								
1.												✓		
2.						✓								
3.														✓
4.				✓										
5.						✓								
6.						✓								



education

Department:
Education
PROVINCE OF KWAZULU-NATAL

UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

GRADE: 12

DATE:

DURATION: 60 minutes

TASK: PRACTICAL TASK

TOTAL MARKS: 30

TOPIC/S: RESPONDING TO THE ENVIRONMENT: HUMANS

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer **ALL** the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. Draw **ALL** diagrams in pencil and label in blue or black ink.
4. Write neatly and legibly.

Skills Assessed (Minimum of 3 skills)

Skills	x/✓	Skills	x/✓
1.Follow instructions	✓	7.2 Hypothesizing	
2.Handle equipment or apparatus	✓	7.3 Selecting apparatus/Material	
3.Make and observations in different ways	✓	7.4 Identifying variables.	
4.Record information or data in a variety of ways	✓	7.5 Suggesting ways of controlling variables	
5.Measure	✓	7.6 Planning an experiment	
6. Interpret, do calculations and represent information in different ways	✓	7.7 Suggesting ways of recording results	
7 Design /plan investigations or experiment by 7.1 Identifying problem		7.8 Understanding the need for replication or verification	✓

1. SHEEP'S BRAIN

METHOD

1. Obtain a sawn (cut using a saw) through sheep's or pig skull from a butcher to show the brain.
2. Can use prepared slides and/or micrographs of the cross section of the brain.
3. Observe an external structure of the sheep's brain.

QUESTIONS

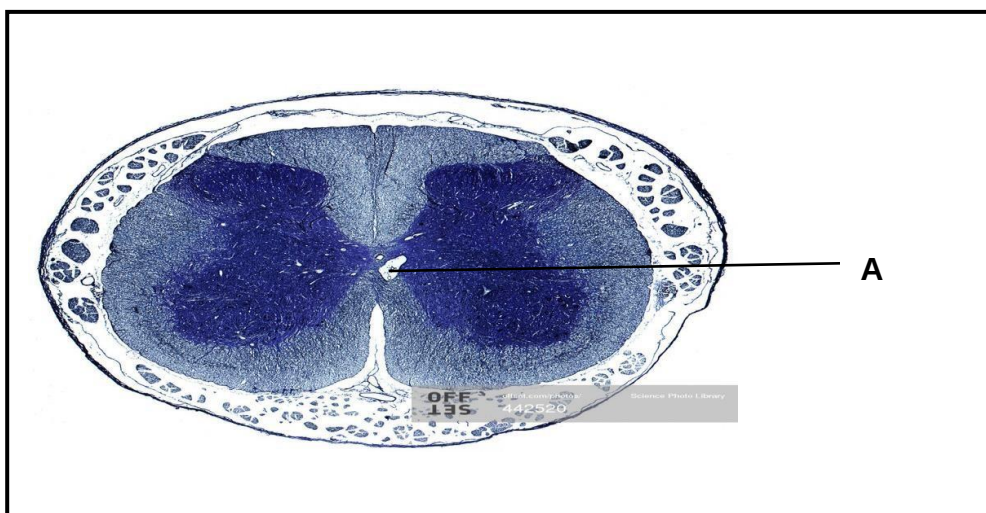
- 1.1 Identify the cerebrum, cerebellum, corpus callosum and medulla oblongata. (2)
- 1.2 What colour is the sheep brain? (1)
- 1.3 Why is the outer surface of the brain folded? (1)
- 1.4 Comparing with the human brain you have studied, name the TWO visible features in the sheep brain that are different from the human brain. (2)

TOTAL QUESTION 2: (6)

2. CROSS-SECTION OF THE HUMAN SPINAL CORD

METHOD

1. Obtain a sawn (cut using a saw) through sheep's or pig vertebrae from a butcher to show spinal cord.
2. Can use prepared slides and/or micrographs of the cross section of a spinal cord.
3. Use a hand lens to observe the parts carefully.
4. Identify the spinal cord in the central canal of the vertebrae.
5. Identify the grey matter, white matter, central canal.
6. If you have a fresh, feel the spinal cord and describe how it feel like.



QUESTIONS

- 2.1 Name the fluid found in the part labelled A in the diagram. (1)
- 2.2 Name:
- (a) the membranes that cover and protect the spinal cord. (1)
 - (b) the darker region of the spinal cord. (1)
 - (c) the lighter region of the spinal cord. (1)
- 2.3 What is the shape of the darker region of the spinal cord? (1)
- 2.4 Name the part of the neuron that makes up most of:
- (a) outer region of the spinal cord. (1)
 - (b) inner region of the spinal cord. (1)
- 2.5 The spinal cord is involved in reflex arc and reflex action.
State the significance of a simple reflex action. (1)
- 2.6 Draw a simple flow diagram to represent a reflex arc. (4)

TOTAL QUESTION 2: (12)

3. REACTION TIME OF DIFFERENT LEARNERS TO A STIMULUS.

Materials needed will be:

- Metric ruler (30cm)
- Table
- Chair

METHOD

Learners work in groups of threes as follows:

Learner 1

1. Sits on the chair with an upright posture and eyes looking across the room.
2. Places the forearm (the part of the arm from elbow to hand) so it extends over the edge of the table.
3. Places the thumb and forefinger next to the 0cm mark of the ruler **without touching it**.

NB: The number "1" on the ruler should be at the bottom and the number "30" at the top.

Learner 2

4. Remains standing next to Learner 1.
5. Holds the ruler between the thumb and index finger just above the 30 cm mark.
6. Drops the ruler.

Learner 1

7. Catches the ruler using the thumb and forefinger.

Learner 3

8. Records the number on the ruler displayed just over Learner 1's thumb.
9. Repeat the procedure three times with Learner 1 catching the ruler.
10. The same procedure is followed with Learner 2 catching the ruler three times and then Learner 3 catching the ruler three times.
11. All the results are recorded in the table below.

	Trial 1 (cm)	Trial 2 (cm)	Trial 3 (cm)	Average
Learner 1				
Learner 2				
Learner 3				

NB: Following instructions and handling apparatus or equipment is assessed using the following rubric:

Guideline for marking the ability to follow instructions and handling apparatus or equipment

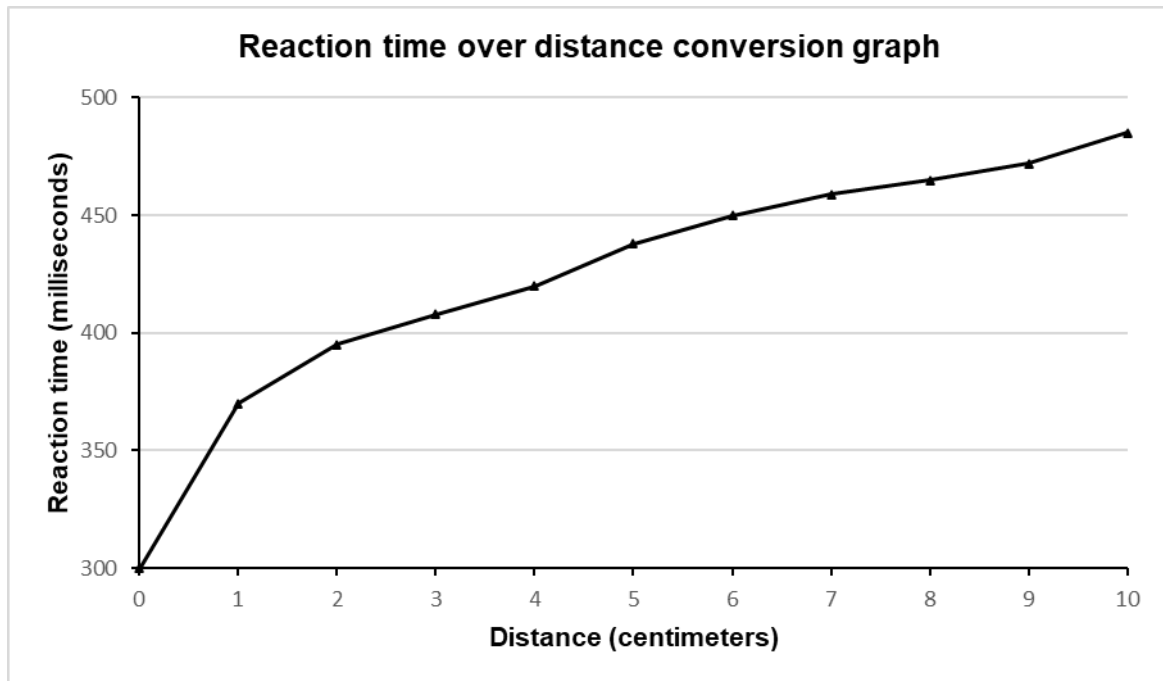
Criteria	Mark Allocation	
	Not Satisfactory (0 mark)	Satisfactory (1 mark)
Following instructions		
Taking measurements		
Recording data		
Working with other learners		

(4)

QUESTIONS

- 3.1 Calculate the average distance in cm for each learner. (3)
- 3.2 State ONE reason why the procedure was repeated three times for each learner. (1)

- 3.3 Describe what you observed with regards to results of each learner. (2)
- 3.4 The graph below shows how the distance on the ruler can be converted to reaction time in milliseconds.



Use the reaction time over distance conversion graph to determine:

- (a) The actual reaction time if the ruler dropped 8 centimeters. (1)
- (b) The distance the ruler will drop for a reaction of 400 milliseconds. (1)

TOTAL QUESTION 3: (12)

GRAND TOTAL: (30)

CHECKLIST FOR SKILLS ASSESSED IN PRACTICAL TASKS

	SKILLS AND SUB-SKILLS													
Question Number	1. Follow instructions	2. Handle equipment or apparatus	3. Make and record observations in different ways	4. Record information or data in a variety of ways	5. Measure	6. Interpret, do calculations and represent information in different ways	7. Design / plan investigations or experiments by: 7.1 Identifying a problem	7.2 Hypothesising	7.3 Selecting apparatus/materials	7.4 Identifying variables	7.5 Suggesting ways of controlling variables	7.6 Planning an experiment	7.7 Suggesting ways of recording results	7.8 Understanding the need for replication or verification
1.1			✓											
1.2			✓											
1.3						✓								
1.4			✓			✓								
2.1						✓								
2.2						✓								
2.3			✓											
2.4						✓								
2.5						✓								
2.6						✓								
11.		✓		✓										
3.1						✓								
3.2														✓
3.3						✓								
3.4						✓								



education

Department:
Education
PROVINCE OF KWAZULU-NATAL

UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____

SUBJECT: LIFE SCIENCES

GRADE: 12

DATE:

DURATION: 60 minutes

TASK: PRACTICAL TASK

TOTAL MARKS: 35

TOPIC/S: RESPONDING TO THE ENVIRONMENT: HUMANS
(DISSECTION OF THE SHEEP'S EYE)

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer **ALL** the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. Draw **ALL** diagrams in pencil and label in blue or black ink.
4. Write neatly and legibly.

SKILLS ASSESSED (minimum 3)

SKILL	✓/x	SKILL	✓/x
3. Follow instructions	✓	7.2 Hypothesising	
4. Handle equipment or apparatus	✓	7.3 Selecting apparatus/materials	
3. Make and record observations in different ways	✓	7.4 Identifying variables	
4. Record information or data in a variety of ways	✓	7.5 Suggesting ways of controlling variables	
5. Measure		7.6 Planning an experiment	
6. Interpret, do calculations and represent information in different ways	✓	7.7 Suggesting ways of recording results	
7. Design / plan Investigations or experiments by: 7.1 Identifying a problem		7.8 Understanding the need for replication or verification	

BACKGROUND

The structure of the human eye can be better shown and understood by the actual dissection of an eye. The size and structures of the sheep eye compare favorably with that of the human eye.

- This is a hands-on task which will be done in pairs, one learner will be dissecting while the other learner will be reading the steps and taking notes on observations.
- Each pair will work with one sheep's eye.
- After completing dissection, each learner will complete the worksheet on his/her own.
- This practical task is done under supervision of a teacher or a demonstrator.

APPARATUS NEEDED:

- Sheep eye (from butcher)
- Dissecting kit (cutting board and instruments)
- Safety goggles
- Surgical gloves
- Razor blade/scalpel and scissors
- Notes book, pen and pencil
- Soap, water, paper towels, plastic, garbage bag for cleaning up.

METHOD

1. Identify a partner to work with (preferably a girl and a boy)
2. Wash the sheep eye in running water to remove the preservative fluid and dry it with paper towel.
3. Examine the front and back of the eye and locate structures that you have been taught in the class.
4. Use the scissors to remove the fatty tissue from both the front and back of the eye. Do not worry about cutting into the white surface of the eye.
5. Place your eye specimen in the dissecting/chopping board.
6. Use a razor/scalpel to cut around the middle of the eye, turn the eye as you continue with cutting. Take note of the clear fluid that is released.
7. Identify the iris and pull it out (call the teacher for confirmation). It should come out in one piece. There is a hole in the center of the iris, what is this hole called? (pupil)

8. Identify the other structures that assist in seeing objects in near or distant vision.
9. Find the vitreous humor at the back of the eye.
10. Remove the marble like structure. Hold it and look through it.
11. Put down this structure in your notebook and look through the words on the page.
12. Identify all the other structures (retina, choroid etc.). You can see some blood vessels.
13. Wrap all the pieces of the eye in plastic and throw them in the garbage bag.
14. Wash your hands and the dissecting kit thoroughly and complete the worksheet **individually**.
15. Following instructions and handling apparatus or equipment is assessed using the following rubric:

Guideline for marking the ability to follow instructions and handling apparatus or equipment

Criteria	Mark Allocation	
	Not Satisfactory (0 mark)	Satisfactory (1 mark)
Following instructions		
Cutting accurately and neatly		
Working with another learner		

(3)

QUESTIONS

1. Name TWO structures that make up the external part of the eye. (2)
2. What is the function of the fatty tissue around the eye? (1)
3. (a) Name the white surface of the eye observed in step 4. (1)
(b) Describe the structure of this white surface. (2)
4. Why is the cornea so cloudy? (1)

5. (a) Name the liquid that was released while cutting the eye in two halves in step 6. (1)
 (b) State TWO functions of this fluid. (2)
6. State ONE function of the iris. (1)
7. Explain TWO ways in which vitreous humor in step 9 is suited to perform its function. (4)
8. (a) Identify the marble like structure in Step 10. (1)
 (b) Name ONE process taking place in the eye in which this structure is involved. (1)
 (c) Describe what you noticed when you placed this structure on your notebook in step 11. (1)
9. (a) Draw the structure of the eye indicating a person who is in a very dark room. (4)
 (b) Name the process that takes place in the eye when a person is in a very dark or bright room. (1)
10. Name structures of the eye numbered 1- 6 and 10-12 using the images in the diagram below. (9)



GRAND TOTAL (35)

CHECKLIST FOR SKILLS ASSESSED IN PRACTICAL TASK

	SKILLS AND SUB-SKILLS														
Question Number	1. Follow instructions	2. Handle equipment or apparatus	3. Make and record observations in different ways	4. Record information or data in a variety of ways	5. Measure	6. Interpret, do calculations and represent information in different ways	7. Design / plan investigations or experiments by:	7.1 Identifying a problem	7.2 Hypothesising	7.3 Selecting apparatus/materials	7.4 Identifying variables	7.5 Suggesting ways of controlling variables	7.6 Planning an experiment	7.7 Suggesting ways of recording results	7.8 Understanding the need for replication or Verification
15.	✓	✓													
1						✓									
2						✓									
3			✓			✓									
4						✓									
5						✓									
6						✓									
7						✓									
8			✓			✓									
9			✓	✓		✓									
10			✓												



UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

GRADE: 12

DATE:

DURATION: 60 minutes

TASK: TEST

TOTAL MARKS: 50

TOPIC/S: GENETICS AND INHERITANCE

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer **ALL** the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. Draw **ALL** diagrams in pencil and label in blue or black ink.
4. Write neatly and legibly.

SECTION A

Question 1

- 1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.3) in your ANSWER BOOK, for example 1.1.4 D.

- 1.1.1 An individual is heterozygous for a harmful recessive allele but is unaffected by it.
Which ONE of the following best represents the genetic composition of this individual?

- A Two dominant normal alleles
- B One harmful recessive allele and one harmful dominant allele
- C One harmful recessive allele and one normal dominant allele
- D One harmful dominant allele and one normal recessive allele

- 1.1.2 A person has the genotype $I^A i$ for blood type.
What is this person's blood group?

- A A
- B B
- C O
- D AB

(2 x 2) (4)

- 1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.4) in your ANSWER BOOK.

- 1.2.1 The production of genetically identical organisms using biotechnology.

- 1.2.2 Genetic disorder characterized by the inability to distinguish certain colours.

- 1.2.3 The type of dominance where none of the alleles is dominant over the other.

- 1.2.4 Having similar alleles for a particular gene. (4 x 1) (4)

1.3 Indicate whether each of the descriptions in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B** or **none** next to the question number (1.3.1 to 1.3.2) in the ANSWER BOOK.

COLUMN I	COLUMN II
1.3.1 Multiple alleles.	A: Human blood groups. B: Colour blindness.
1.3.2 The separation of alleles during gamete formation	A: Law of Dominance B: Principle of Segregation

(2 x 2) (4)

1.4 There is variation in the characteristics of fur colour and fur texture in cats. The table below shows the alleles that control these two characteristics.

CHARACTERISTIC	ALLELE	PHENOTYPE
Fur colour	B	Black
	b	White
Fur texture	R	Rough
	r	Smooth

The Punnett square below shows the inheritance of these alleles in a genetic cross.

All possible gametes from female		All possible gametes from male			
↓	bR	BR	Br	bR	br
		BbRR	BbRr	X	bbRr

- 1.4.1

Name the:

(a) Dominant phenotype for fur colour.

(b) Recessive phenotype for fur texture.

(1)

(1)
- 1.4.2

Give the:

(a) Genotype of offspring X

(b) Phenotype of the female parent

(c) Genotype of the male parent

(1)

(2)

(2)
- 1.4.3

State the phenotype that ALL the offspring of this genetic cross have in common.

(1)
- (8)

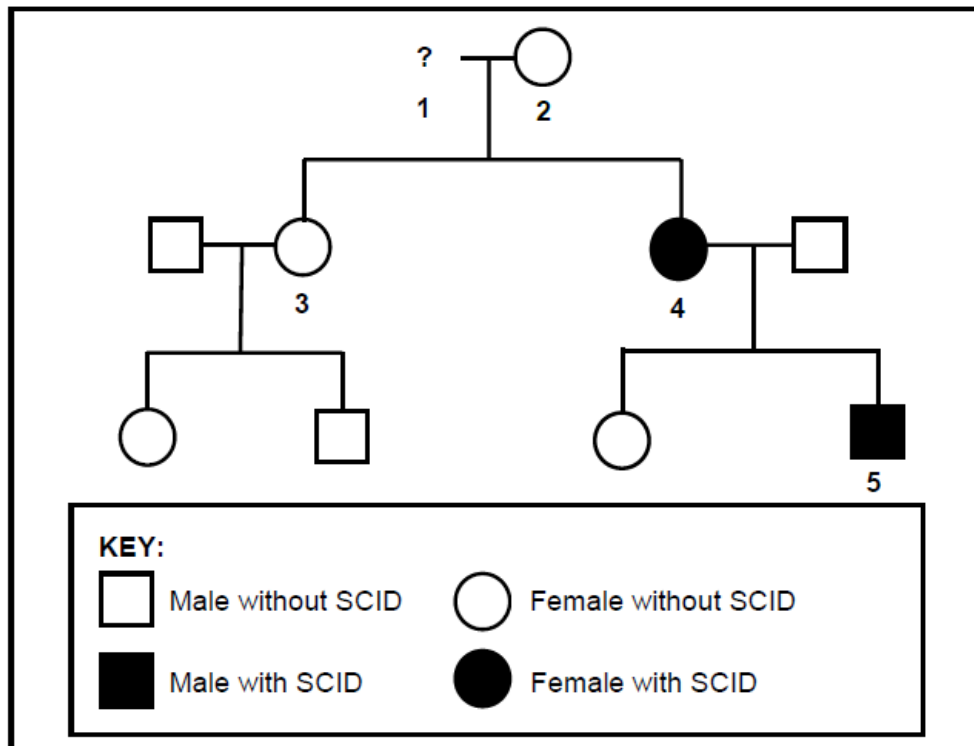
TOTAL SECTION A:

(20)

SECTION B

Question 2

- 2.1 Severe combined immune deficiency syndrome (SCID) is a disorder affecting the immune system. It is caused by a sex-linked recessive allele (X^d). The diagram below shows the inheritance of the disorder in a family. It is not known if individual 1 has the disorder or not.



- 2.1.1 State the:
- (a) phenotype of individual 2. (1)
 - (b) phenotype of individual 1. (1)
 - (c) genotype of individual 3. (1)
- 2.1.2 Explain how individual 5 inherited the disorder. (2)
- (5)

2.2 Read the extract below.

The first cloned animal in Africa, a calf named Percy, was born in North West in South Africa on 19 April 2003. No fertilization was involved in the production of Percy. She was produced from a single cell taken from the ear of a donor cow named LMJC 865. The donor cow had a high average milk yield of 78 litres a day. Cloning allows for the production of organisms with desired characteristics. Some people argue that cloning reduces genetic variation in the offspring, with no further genetic improvement. Cloning is an expensive procedure and may not be economical for commercial agriculture.

- 2.2.1 According to the extract, state ONE: (1)
- (a) advantage of cloning (1)
- (b) disadvantage of cloning (1)
- 2.2.2 State why the donor cell was taken from LMJC 865 and not from any other cow. (1)
- 2.2.3 State why an ear cell was used and not an ovum. (2)
- 2.2.4 Briefly describe the process of cloning. (4)
- (9)

TOTAL QUESTION 2: (14)

Question 3

- 3.1 A man with blood group **AB** and a woman who is heterozygous for blood group **B** plan to have children.
- 3.1.1 How many alleles control the inheritance of blood groups? (1)
- 3.1.2 Describe the type of dominance that occurs in the inheritance of blood group B in the woman. (3)
- 3.1.3 Use a genetic cross to show all the possible genotypes and phenotypes of their children. (6)
- (10)

- 3.2 In certain marine invertebrates the colour of the shell is under the control of one gene with three alleles. In different combinations, the three alleles produce four phenotypes: orange, yellow, orange-yellow and black.

The table below shows the results of the offspring produced from crosses involving parents of different phenotypes.

CROSS	PHENOTYPES OF SHELLS	
	PARENTS	OFFSPRING
1	Yellow x yellow	27 yellow: 9 black
2	Black x black	All black
3	Orange x orange	30 orange: 10 black
4	Orange x yellow	All orange-yellow

- 3.2.1 Name and explain the type of dominance shown by cross 4. (3)
- 3.2.2 Which shell colour is controlled by the recessive allele? (1)
- 3.2.3 Use information in the table to support your answer to QUESTION 3.2.2. (2)

(6)

TOTAL QUESTION 3: (16)

TOTAL SECTION B: (30)

GRAND TOTAL: (50)



UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

GRADE: 12

DATE:

DURATION: 60 minutes

TASK: TEST

TOTAL MARKS: 50

TOPIC/S: RESPONDING TO THE ENVIRONMENT (HUMANS)

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer **ALL** the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. Draw **ALL** diagrams in pencil and label in blue or black ink.
4. Write neatly and legibly.

SECTION A

Question 1

1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.7) in your ANSWER BOOK, for example 1.1.4 D.

1.1.1 The part that controls the amount of light entering the eye

- A Cornea
- B Iris
- C Choroid
- D Lens

1.1.2 The receptor(s) involved in maintaining balance is/are the...

- A Organ of Corti only.
- B Maculae only.
- C Maculae and cristae only.
- D Organ of Corti, maculae and cristae.

1.1.3 During a reflex action, impulses enter the spinal cord by means of a/an...

- A Sensory neuron through the ventral root of the spinal nerve.
- B Sensory neuron through the dorsal root of the spinal nerve.
- C Interneuron through the ventral root of the spinal nerve.
- D Interneuron through the dorsal root of the spinal nerve

1.1.4 Structures that are protected by the meninges

- A Spinal cord and receptors
- B Brain and effectors
- C Effectors and receptors
- D Spinal cord and brain

1.1.5 The CORRECT statement with regards to astigmatism?

- A Light cannot pass through the cornea
- B Light cannot pass through the lens
- C Refraction of light rays by the cornea is uneven
- D The lens cannot become more rounded

(5 x 2)

(10)

- 1.2

Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.4) in your ANSWER BOOK.
- 1.2.1

The part of the brain that controls body temperature.

1.2.2

A branch of the nervous system that is made up of spinal and cranial nerves.

1.2.3

The area of the retina that contains the highest concentration of cones.

1.2.4

The small device that is inserted in the ear to drain fluid caused by a middle-ear infection.
- (4 x 1)

(4)

- 1.3

Indicate whether each of the descriptions in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B** or **none** next to the question number (1.3.1 to 1.3.3) in the ANSWER BOOK.

COLUMN I	COLUMN II
1.3.1 The functional connection between two consecutive neurons	A Synapse B Effector
1.3.2 Converts a stimulus into an impulse	A Effector B Receptor
1.3.3 A disorder of the nervous system characterized by the degeneration of brain cells	A Goitre B Alzheimer's disease

(3 x 2)

(6)

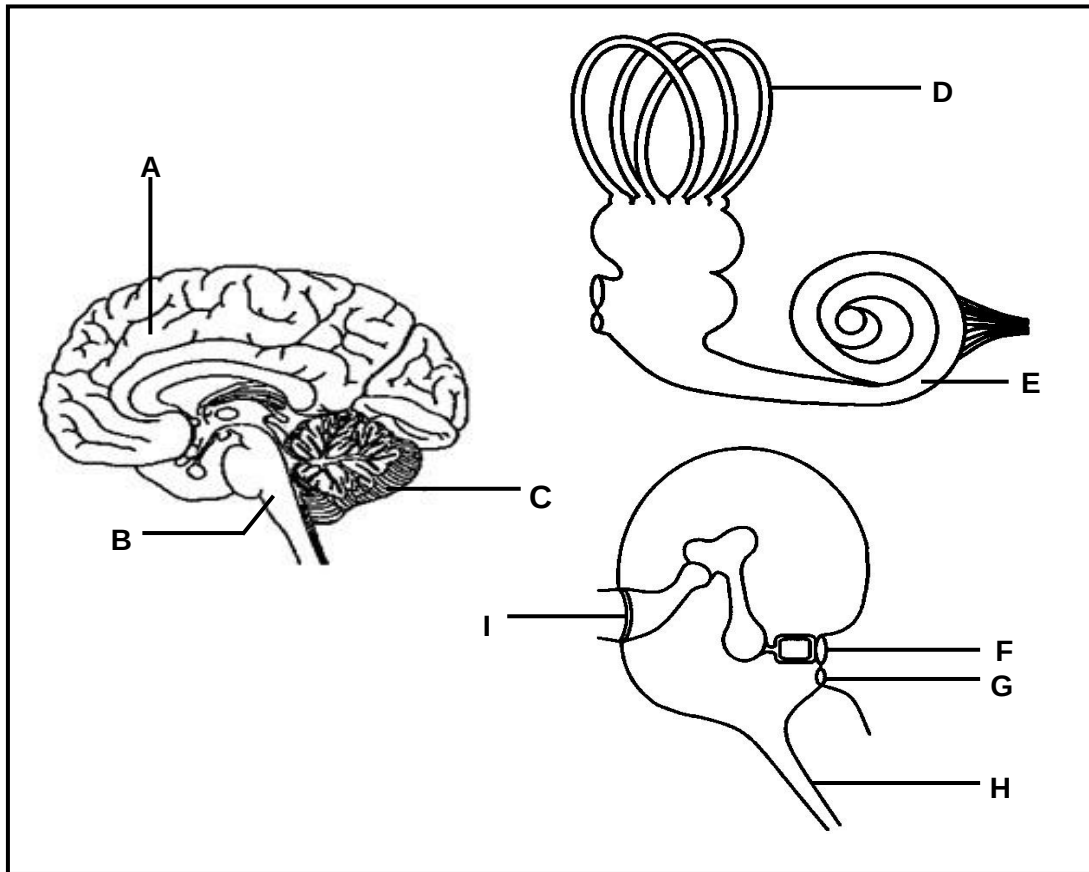
TOTAL SECTION A:

(20)

SECTION B

Question 2

2.1 The diagrams below show different parts of the brain and the ear.



2.1.1 Identify part:

- (a) **A** (1)
- (b) **B** (1)

2.1.2 Give the LETTER and NAME of the part of the ear that absorbs excess pressure waves from the inner ear. (2)

2.1.3 Name the receptors found at part **E**. (1)

2.1.4 Explain why damage to part **B** can lead to instant death. (2)

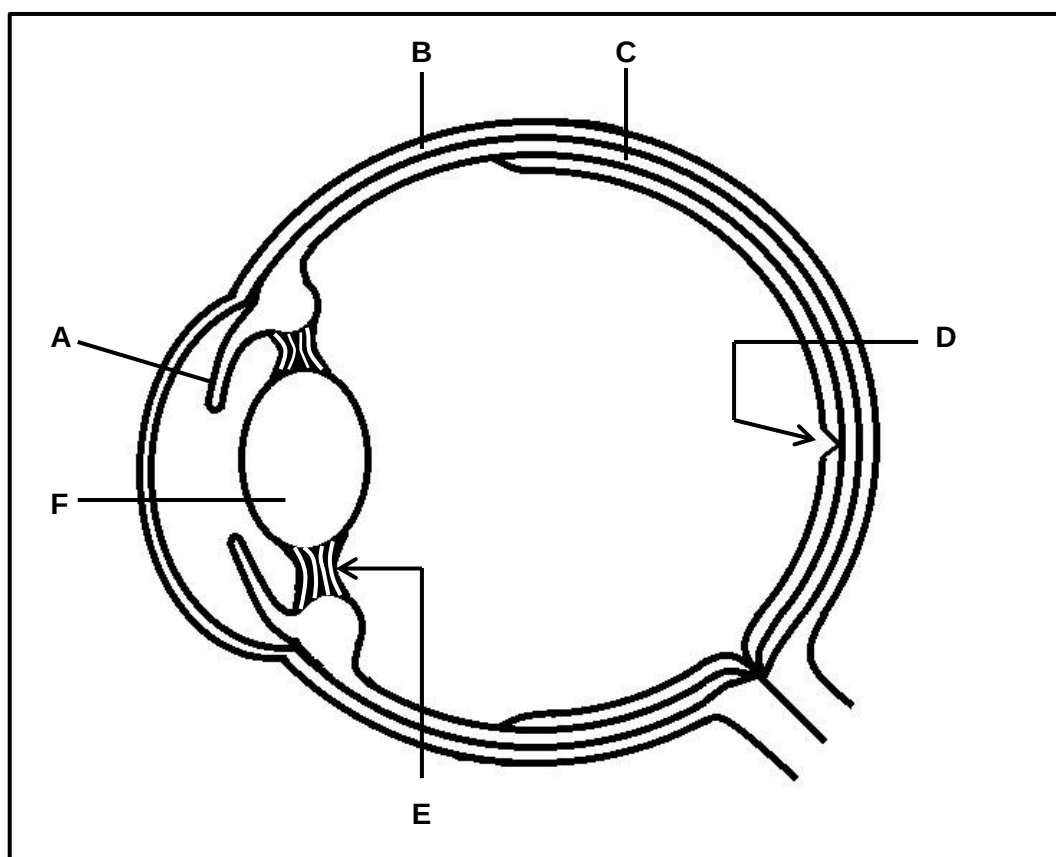
2.1.5 Describe how part **C** responds to impulses received from **D**. (2)

2.1.6 In older people, part **F** of the ear may harden.
Explain how this condition may lead to hearing loss. (3)

TOTAL QUESTION 2: (12)

QUESTION 3

3.1 The diagram below represents the structure of the human eye.



3.1.1 Identify part **C**. (1)

3.1.2 Give ONE function of part **E**. (1)

3.1.3 State why the clearest image will form when light rays fall on part **D**. (1)

3.1.4 Explain ONE way in which part **B** is structurally different from part **F**. (4)
(7)

3.2 Describe the accommodation of the eye for distant vision. (5)

3.3 The table below shows the recorded number of severe brain injuries per 100 000 people per year in different regions of the world.

REGIONS OF THE WORLD	NUMBER OF SEVERE BRAIN INJURIES (PER 100 000 PEOPLE PER YEAR)
Latin America	900
USA and Canada	1300
East Mediterranean	890
Europe	1010
Africa	800

3.3.1 Draw a bar graph to represent the data in the table (6)

TOTAL QUESTION 3: (18)

TOTAL SECTION B: (30)

GRAND TOTAL: (50)



UMGUNGUNDLOVU DISTRICT

NAME OF SCHOOL: _____.

SUBJECT: LIFE SCIENCES

GRADE: 12

DATE:

DURATION: 60 minutes

TASK: TEST

TOTAL MARKS: 50

TOPIC/S: ENDOCRINE SYSTEM AND HOMEOSTASIS

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer **ALL** the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. Draw **ALL** diagrams in pencil and label in blue or black ink.
4. Write neatly and legibly.

SECTION A

Question 1

1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.7) in your ANSWER BOOK, for example 1.1.4 D.

1.1.1 The following gland is an exocrine gland:

- A pituitary gland
- B prostate gland
- C adrenal gland
- D thyroid gland

1.1.2 Sweating helps a person who runs a race, to ...

- A regulate the amount of salts in the body
- B control the amount of glucose in the body
- C cool the body through evaporation
- D regulate the amount of water in the body

1.1.3 On a hot day...

- A less blood flows to the surface of the skin
- B the sweat glands become inactive.
- C more blood flows to the surface of the skin.
- D vasoconstriction takes place.

1.1.4 A person produces a smaller volume of urine most probably because...

- A ADH levels are high in the blood and the renal tubules are more permeable to water.
- B ADH levels are high in the blood and the renal tubules are less permeable to water.
- C ADH levels are low in the blood and the renal tubules are more permeable to water.
- D ADH levels are low in the blood and the renal tubules are less permeable to water.

1.1.5 A patient suffers from an under secretion of ADH. This will lead to...

- A A high concentration of sodium in the urine.
- B The presence of glucose in the urine.
- C Decreased thirst.
- D The formation of large volume of urine.

(5 x 2)

(10)

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.4) in your ANSWER BOOK.

1.2.1 Hormone that stimulates the mammary glands to produce milk.

1.2.2 Hormone which controls the metabolic rate.

1.2.3 A hormone that increases the blood glucose level in the body.

1.2.4 The process of maintaining a constant internal environment in the human body.

(4 x 1)

(4)

1.3 Indicate whether each of the descriptions in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B** or **none** next to the question number (1.3.1 to 1.3.3) in the ANSWER BOOK.

COLUMN I	COLUMN II
1.3.1 Hormone secreted by the pituitary gland	A Adrenalin B Growth hormone
1.3.2 The hormone that is in excess in a person that grows abnormally tall	A ADH B Thyroxin
1.3.3 A gland whose secretions are transported through blood stream.	A Exocrine B Endocrine

(3 x 2)

(6)

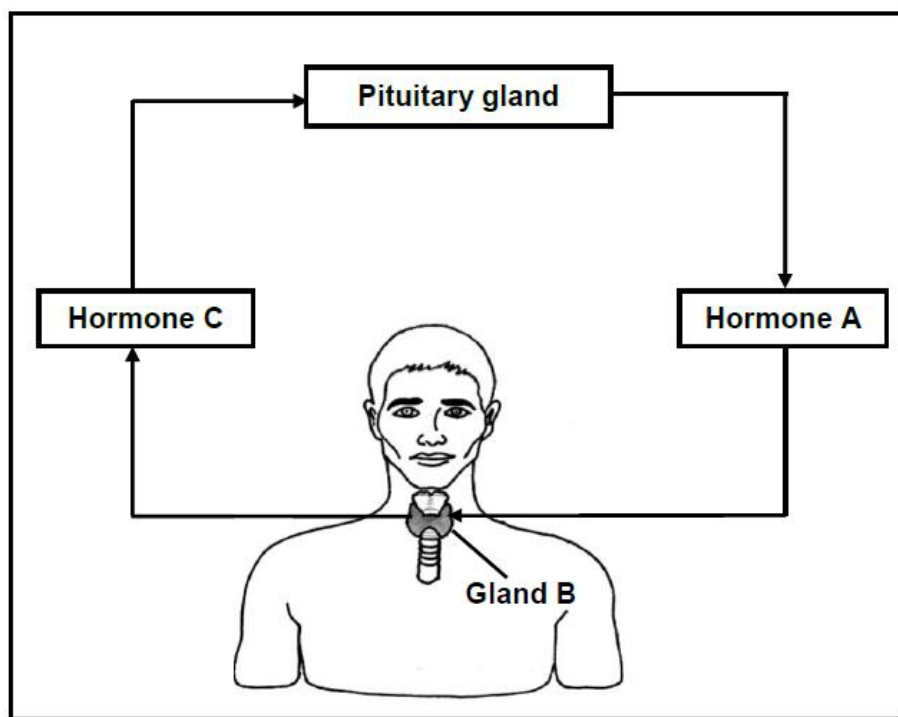
TOTAL SECTION A:

(20)

SECTION B

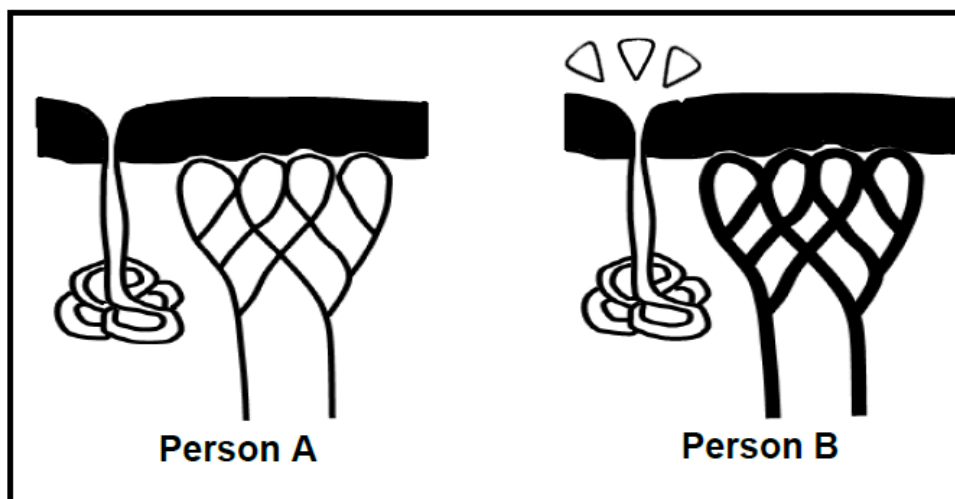
Question 2

2.1 The diagram below shows the interaction between two endocrine glands.



- 2.1.1 Name the type of interaction that occurs between hormone **A** and gland **B**. (1)
- 2.1.2 Identify: (1)
- (a) Gland **B** (1)
 - (b) Hormone **A** (1)
 - (c) Hormone **C** (1)
- 2.1.3 Name the disorder that results when gland B is overstimulated and becomes enlarged. (1)
- 2.1.4 Name the hormone (A or C) that will be high in the blood of person with the disorder named in QUESTION 2.1.3. (1)
- (6)**

- 2.2 The diagram below represent structure in the skin of two people. Both people were in the same room at the same time, but one person was exercising while the other person was sitting still. The skin surface temperature of both people was measured after 10 minutes.



- 2.2.1 Identify whether person **A** or **B** was exercising. (1)
- 2.2.2 Name TWO visible reasons for your answer to QUESTION 2.2.1 (2)
- 2.2.3 Name ONE hormone that would have the same effect on the blood vessels that is observable in person **A**. (1)
- 2.2.4 After 10 minutes the surface skin temperature of each person was measured. The results were as follows:

- Person **A**: 37,2 °C
- Person **B**: 36,6 °C

Explain why the skin temperature of person **A** was higher after 10 minutes.

(3)
(7)

TOTAL QUESTION 2: (13)

QUESTION 3

3.1 An investigation was carried out to determine the influence of alcohol on the volume of urine produced.

12 healthy, 23-year-old males of similar height and mass participated in the investigation.

The investigation was conducted as follows:

- The men were divided into two groups of six each, Group A and Group B.
- The two groups ate the same food and did the same exercise for 24-hour period before testing.
- Each group was given the following drink after 24 - hour period:
 - Group A: 1 litre of alcohol-free beer (beer that does not contain alcohol)
 - Group B: 1 litre of alcohol beer.
- Urine was collected from each man every hour.

Assume that the volume of urine collected is equal to the volume of urine produced.

The results of the investigation are shown in the table below.

TIME OF COLLECTION	AVERAGE VOLUME OF URINE COLLECTED (ml)	
	GROUP A	GROUP B
After 1 hour	599	643
After 2 hours	413	504
After 3 hours	112	132

3.1.1 State:

- (a) The dependent variable in this investigation. (1)
- (b) THREE planning steps the investigators had to take before the investigation could start. (3)
- (c) TWO factors that need to remain constant, other than the ones already mentioned. (2)
- (d) TWO steps that the investigators took to ensure the reliability of the investigation. (2)

3.1.2 Based on the results, explain how the intake of alcohol influences the secretion of ADH and consequently the volume of urine that is produced by the kidney. (4)
(12)

3.2 Describe how the human body maintains the carbon dioxide concentration in the blood when it rises above normal limits. (5)

TOTAL QUESTION 3: (17)
TOTAL SECTION B: (30)

GRAND TOTAL: (50)

