Downloaded from SEE academy: www.seeacademy.coza

education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 10

LIFE SCIENCES

JUNE 2024

SEE ACADEMY

MARKS: 150

TIME: 2½ hours

This question paper consists of 16 pages.

Copyright reserved

Downloaded from SEE academy: www.seeacademy.coza

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in your ANSWER BOOK.
3. Start the answers to each question at the top of a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Present your answers according to the instructions of each question.
6. Do ALL drawings in pencil and label them in blue or black ink.
7. Draw diagrams, tables or flow charts only when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. Do NOT use graph paper.
10. You may use a non-programmable calculator, protractor and a compass where necessary.
11. Write neatly and legibly.

SEE ACADEMY

Copyright reserved

Downloaded from SEE academy: www.seeacademy.coza

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-D) next to the question numbers (1.1.1 to 1.1.10) in the ANSWER BOOK, e.g. 1.1.11 D.

1.1.1 Proteins differ from carbohydrates and fats in that they all …

A are fairly large molecules.

B contain the element nitrogen.

C occur only in animal cytoplasm.

D function as enzymes.

1.1.2 The reagent used to test for the presence of proteins is …

A iodine solution.

B alcohol.

C Benedict's solution.

D Biuret reagent.

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

A 3 cells

B 4 cells

C 8 cells

D 16 cells

1.1.4 Cells in the leaf that do not contain chloroplasts.

A Guard cells

B Sclerenchyma cells

C Palisade cells

D Parenchyma cells

SEE ACADEMY

Copyright reserved

Downloaded from SEE academy: www.seeacademy.coza

1.1.5 Which type of cell does not play a role in strength and support?

A Xylem vessel

B Collenchyma

C Companion cells

D Xylem tracheids

1.1.6 The growth tip of the root of a plant consists mainly of …

A companion cells.

B epidermal cells.

C meristematic tissue.

D conducting tissue.

1.1.7 Contains the genetic information of an organism

A Chloroplast

B Mitochondrion

C Nucleus

D Centrosome

1.1.8 A compound only found in plants cells.

A Cellulose

B Glucose

C Lipids

D Water

1.1.9 The organelle that plays a role in cell division is …

A vacuole.

B centrosome.

C chloroplast.

D ribosomes.

SEE ACADEMY

Copyright reserved

Downloaded from SEE academy: www.seeacademy.coza

1.1.10 Component of the blood that destroys the bacteria.

A Red blood corpuscles

B Platelets

C White blood cells

D Plasma (10 x 2) **(20)**

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 1.2.5) in the ANSWER BOOK.

1.2.1 The vitamin that prevents night blindness

1.2.2 Organelle in animal cells that contain digestive enzymes

1.2.3 The red pigment found in erythrocytes

1.2.4 The bond between two amino acids

1.2.5 The collective name for the bone tissue and blood tissue (5 x 1) **(5)**

1.3 Indicate whether each of the statements in COLUMN I apply 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	Organisms without a true nucleus	A. Prokaryote B. Eukaryote
1.3.2	Pore on a leaf that allows for gaseous exchange	A. Stroma B. Stoma
1.3.3	Type of reaction when a complex molecule is built up	A. Anabolic B. Catabolic

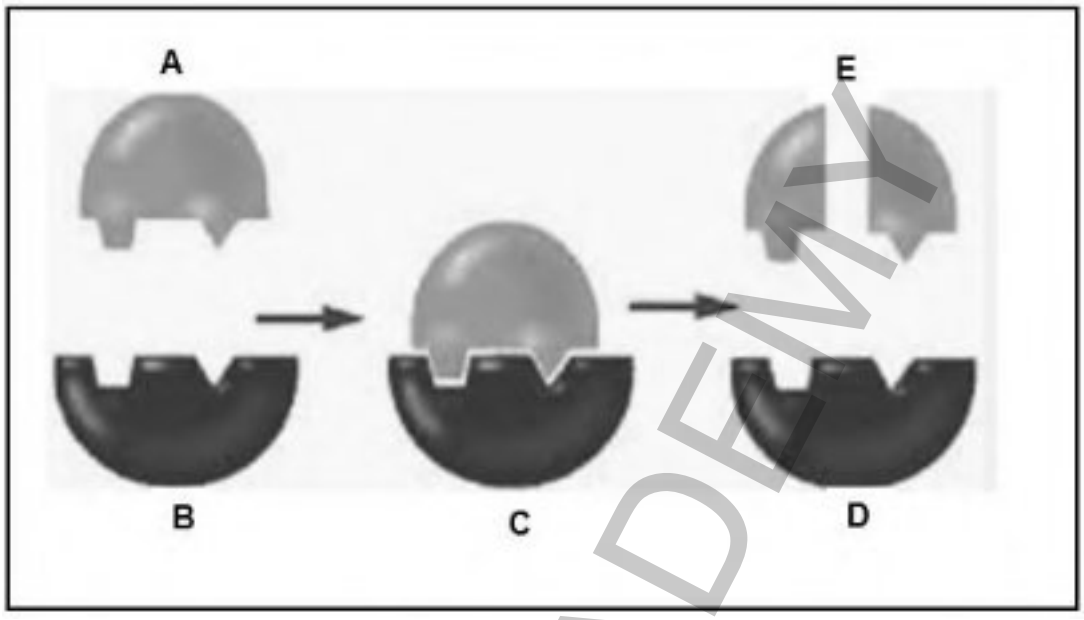
(3 x 2) **(6)**

SEE ACADEMY

Copyright reserved

Downloaded from SEE academy: www.seeacademy.coza

1.4 The diagram below shows enzyme activity.



1.4.1 Write down the LETTER that represent an enzyme (1)

1.4.2 Give a reason for your answer in 1.4.1 (1)

1.4.3 Name the substance labelled **C** (1)

1.4.4 Explain how part labelled **B** is affected by increasing pH. (3)

1.4.5 State ONE importance of enzymes in living organisms (1)

1.4.6 Mention the mechanism represented by the above diagram and describe how it explains the functioning of enzyme. (5)
(12)

SEE ACADEMY

Copyright reserved

Downloaded from SEE academy: www.seeacademy.coza

1.5

Some washing powders are described as having **'biological'** action because they contain enzymes. These powders are particularly useful for removing stains such as blood, egg, chocolate and gravy. The manufactures suggest that such washing powders are most effective in lukewarm water, rather than cold or boiling water.

1.5.1 Give a reason why the biological washing powders are more effective to remove the stains mentioned above, than ordinary washing powders. (1)

1.5.2 At which temperature (in °C) would you say the lukewarm water must be for the best results? (1)

1.5.3 Explain why manufacturers suggest that biological washing powders are less effective at high temperatures. (2)

1.5.4 Suggest ONE reason why biological washing powders are more economical than ordinary washing powders. (1)

1.5.5 What is meant by term optimum temperature? (2)
(7)

TOTAL SECTION A: 50

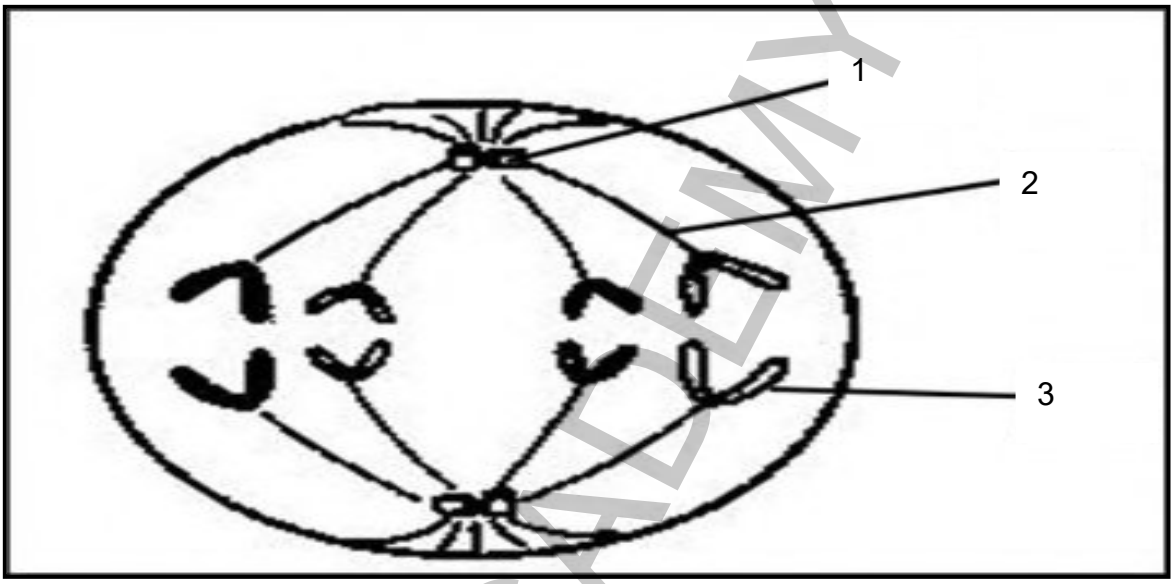
SEE ACADEMY

Downloaded from SEE academy: www.seeacademy.coza

SECTION B

QUESTION 2

2.1 The diagram below shows a cell during a cell division.



2.1.1 Provide the labels for parts 1, 2 and 3 (3)

2.1.2 How many chromosomes are shown in the diagram above? (1)

2.1.3 How many chromosomes would be found in the daughter cells at the end of cell division of the cell above? (1)

2.1.4 Mention TWO ways in which mitosis is biological significant. (2)

2.1.5 Make a neat labelled diagram of a cell with FOUR (4) chromosomes during metaphase of mitosis. (4)
(11)

SEE ACADEMY

Copyright reserved

Downloaded from SEE academy: www.seeacademy.coza

2.2 Read the following extract about cancer.

CANCER- MITOSIS GONE WRONG

Colorectal cancer, also called colon cancer or large bowel cancer, includes cancerous growths in the colon, rectum and appendix. Colorectal cancer is the type of cancer that affects the colon (large intestine) and rectum.
With 655 000 deaths worldwide per year, it is the third most common form of cancer and the second leading cause of cancer-related deaths in the Western world. These mushroom-shaped growths are usually benign, but some may develop into cancer over time. The majority of the time, the diagnosis of localized colon cancer is through a colonoscopy. Therapy is usually through surgery, which in many cases is followed by chemotherapy.

2.2.1 What is meant by colorectal cancer? (1)

2.2.2 Explain the statement that cancer is 'mitosis gone wrong'. (2)

2.2.3 State TWO ways on how can cancer be treated. (2)
(5)

2.3 The root of an onion is rapidly growing part of the onion. Many cells will be in different stages of mitosis. A sample of an onion tip was stained and studied under a microscope.

The various phases of mitosis were identified and number of cells counted in each phase. The results are shown in the table below.

	Number of cells			
	1	**2**	**3**	**Total**
Interphase	47	49	58	154
Prophase	5	7	18	30
Metaphase	2	4	1	7
Anaphase	10	10	2	22
Telophase	4	4	4	12

2.3.1 Which phase produced:

(a) Highest number of cells (1)

(b) Lowest number of cells (1)

2.3.2 Calculate the percentage increase between cell 1 and cell 3 of cells produced during interphase. (3)

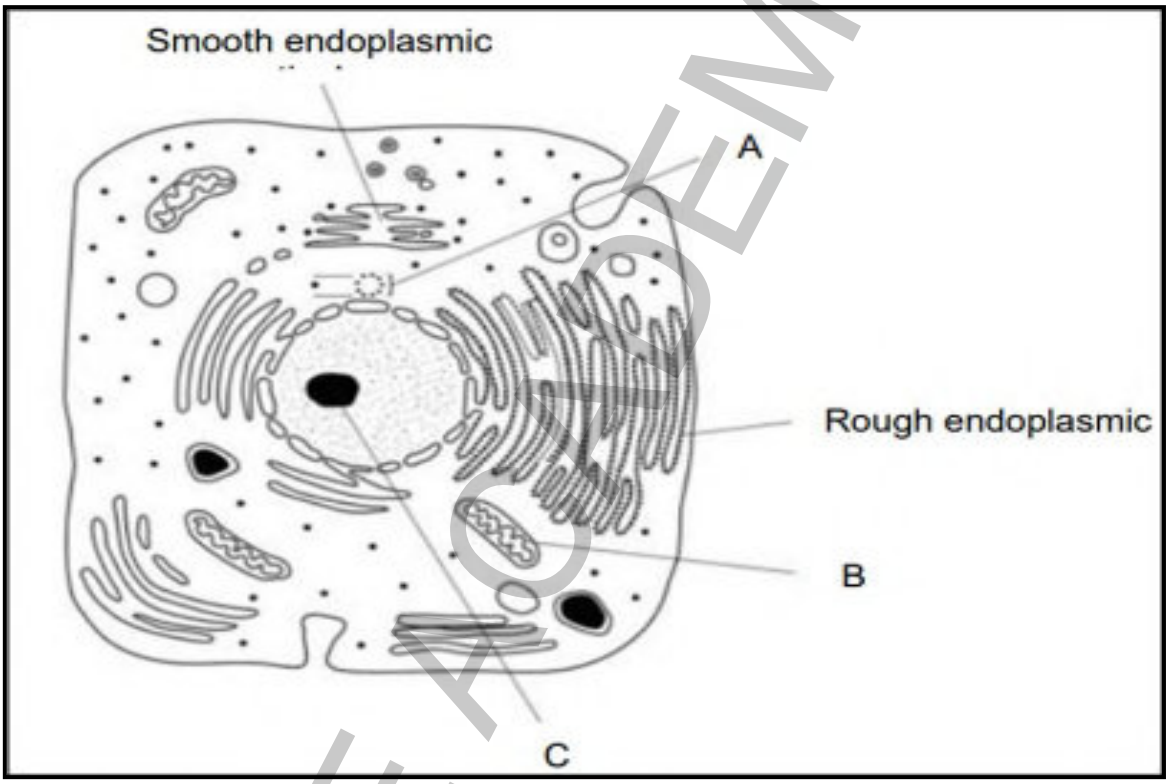
SEE ACADEMY

Downloaded from SEE academy: www.seeacademy.coza

2.3.3 Briefly describe what happens during the Prophase stage of mitosis. (4)

2.3.4 Draw a bar graph to represent the total number of cells in each phase of the cell cycle. (6)
(15)

2.4 The diagram below represents a cell of a living organism.



2.4.1 Does this cell represent a plant or animal cell? (1)

2.4.2 Give TWO visible reasons for your answer in QUESTION 2.4.1 (2)

2.4.3 Write down only the LETTER of the part that is associated with the:

(a) Process of cellular respiration (1)

(b) Transmission of hereditary characteristics (1)
(5)

2.5 The vacuole is membrane bound organelle and plays an important role in plant cells.

2.5.1 Name the membrane surrounding a vacuole. (1)

2.5.2 Mention TWO functions of the vacuole in plant cells. (2)
(3)

2.6 Tabulate THREE differences between plant and animal cells. **(7)**

SEE ACADEMY

Downloaded from SEE academy: www.seeacademy.coza

2.7 Study the data in the following table and answer the questions that follow.

Comparison of the composition of the types of blood cells per mm^3 blood

Types of blood cells	Number of blood cells per mm^3 blood in three people		
	Nceba	Zhandalee	Vastheek
Erythrocytes (red blood cells)	8 350 000	2 200 500	6 000 500
Leucocytes (white blood cells)	580	6 950	5 300
Thrombocytes (blood platelets)	247 500	258 000	175

2.7.1 Identify the person:

(a) Who is most immune to disease (1)

(b) Who suffers from haemophilia (blood cannot clot) (1)

2.7.2 Explain the function of an erythrocyte (2)
(4)

TOTAL QUESTION 2: [50]

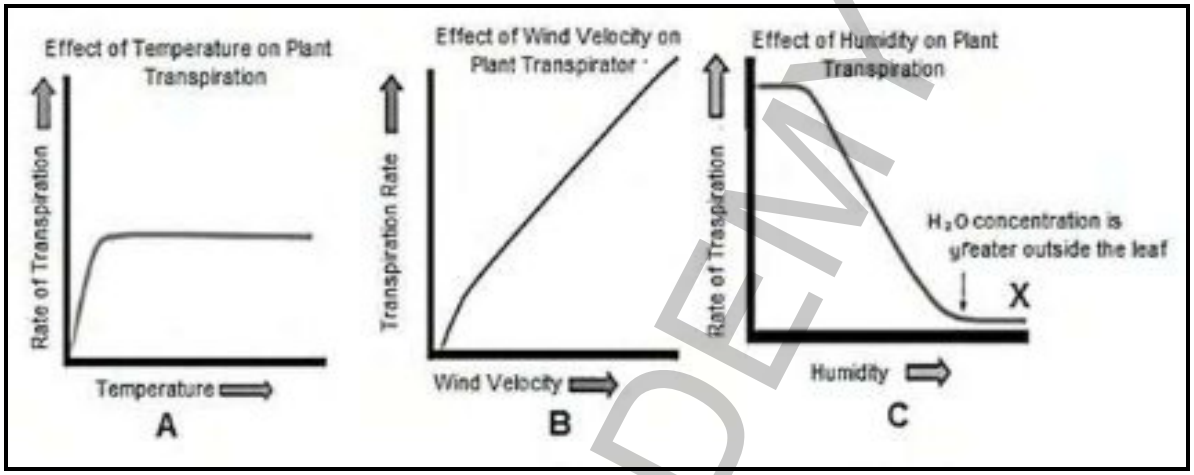
SEE ACADEMY

Copyright reserved

Downloaded from SEE academy: www.seeacademy.coza

QUESTION 3

3.1 The graphs below shows the transpiration rates in different environmental conditions.



3.1.1 Define the term transpiration. (2)

3.1.2 From the graph A, describe the relationship between temperature and the rate of transpiration. (2)

3.1.3 Explain the shape of the graph at **X**, in graph **C**. (2)

3.1.4 Explain how night time affects transpiration in plants. (2)
(8)

3.2 A scientist wanted to investigate whether light is required for the germination of seeds.

She filled two plant pots of the same size with equal amounts of soil. Pot 1 was labelled 'LIGHT' and pot 2 'DARK'. Five lettuce seeds were planted in each of the pots. Both plants were given sufficient water.
Pot 1 was put in direct sunlight. A cardboard box was placed over Pot 2 and no light was allowed to enter.

3.2.1 Identify the:

(a) Independent variable (1)

(b) Dependent variable (1)

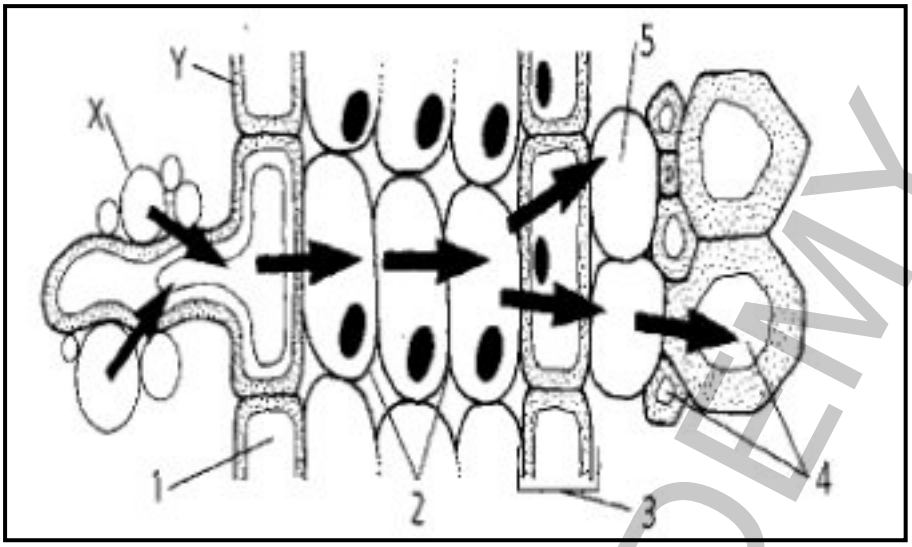
3.2.2 List TWO variables that were kept constant. (2)

3.2.3 Suggest ONE way in which the reliability of the experiment could be improved. (1)
(5)

SEE ACADEMY

Downloaded from SEE academy: www.seeacademy.coza

3.3 The diagram below shows the movement of water across the plant tissues.



3.3.1 Give labels for parts numbered **1**, **4** and **5**. (3)

3.3.2 Explain the process of water absorption from **X** through the root. (6)

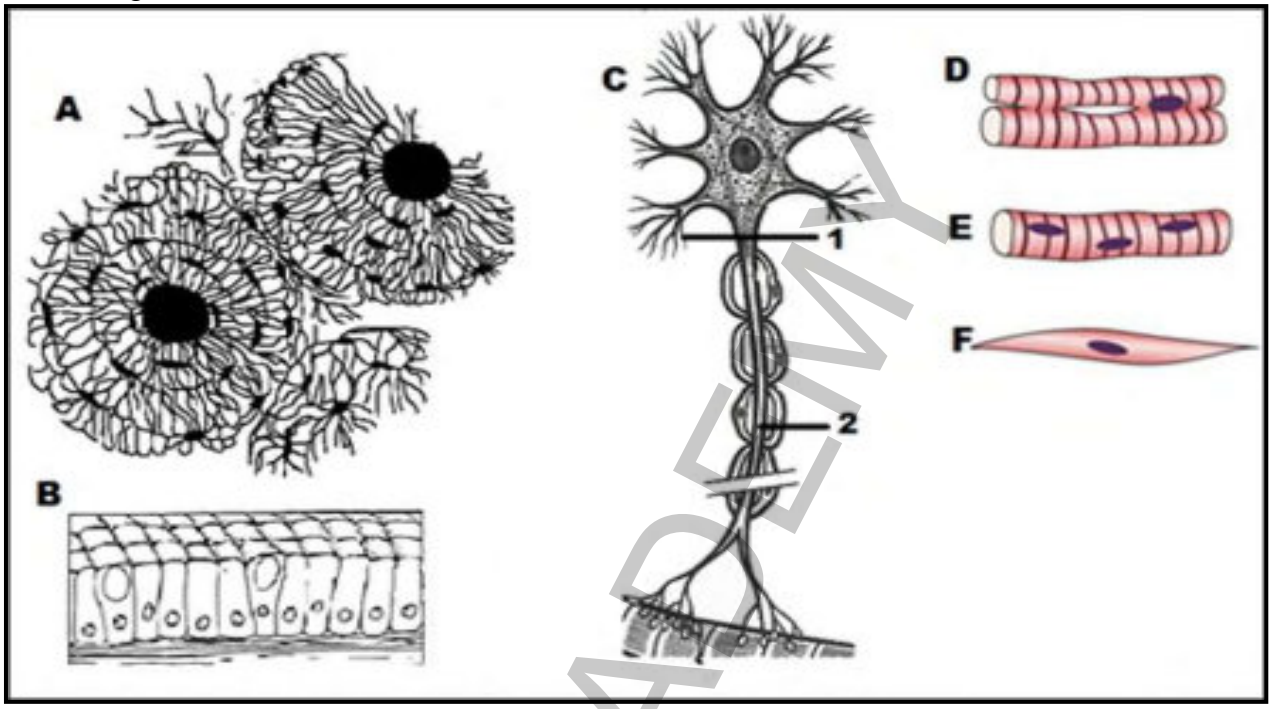
3.3.3 Explain the difference in water potential between the root hair and ground water to make water uptake possible. (2)

3.3.4 Name THREE forces responsible for the movement of water through the tissue indicated by number **4**. (3)
(14)

SEE ACADEMY

Downloaded from SEE academy: www.seeacademy.coza

3.4 The diagrams below shows different animal tissues.



3.4.1 Identify the animal tissue labelled:

(a) **A** (1)

(b) **C** (1)

3.4.2 Identify part:

(a) **1** (1)

(b) **2** (1)

3.4.3 Tissue **B** is made up of specialized cells. Give the name of the specialized cells (1)

3.4.4 Write down the LETTER of the tissue that:

(a) Is found in the walls of the digestive system, respiratory system and reproductive system. (1)

(b) Is found in the heart and make up the walls of the heart. (1)

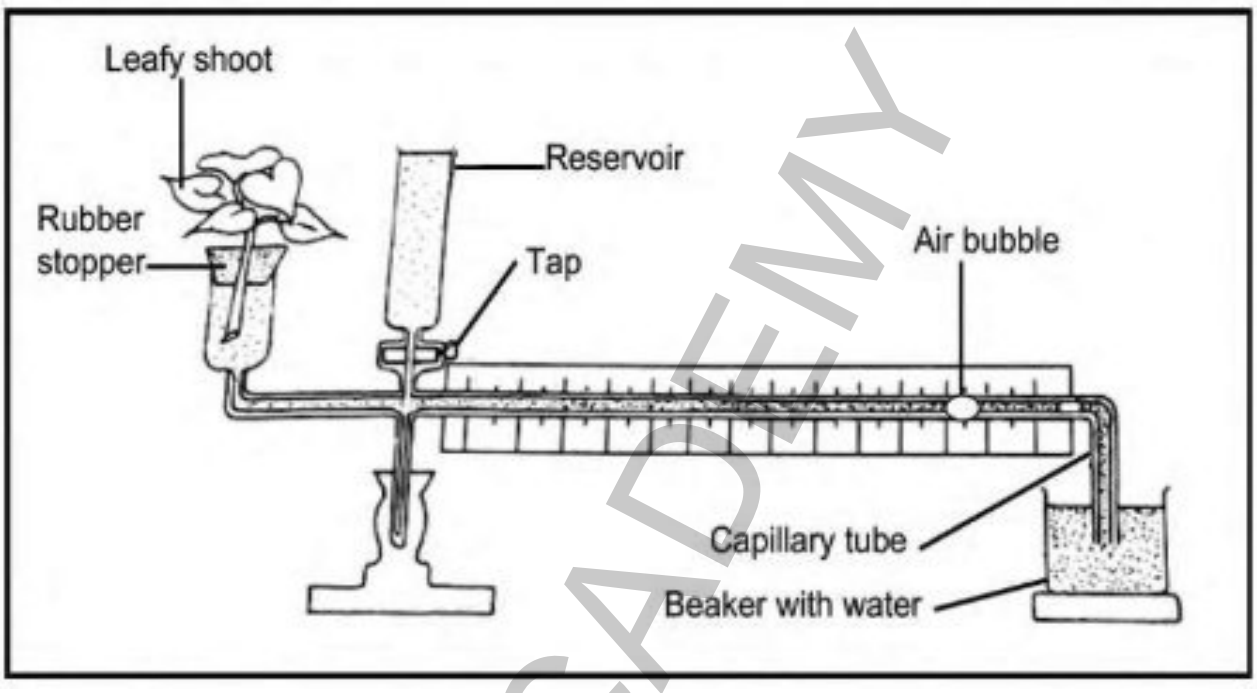
3.4.5 State the function of the tissue labelled **E**. (1)
(8)

SEE ACADEMY

Copyright reserved

Downloaded from SEE academy: www.seeacademy.coza

3.5 A group of Grade 10 learners set up the apparatus shown below to investigate the effect of temperature on the rate of transpiration. This investigation was done three times.



3.5.1 Identify the apparatus shown above. (1)

3.5.2 Explain why the leafy shoot should be cut underwater. (2)

3.5.3 Explain the purpose of the air bubble. (2)

3.5.4 What is the purpose of the water in the reservoir? (1)

3.5.5 State TWO precautions you would take to ensure reliable results. (2)
(8)

SEE ACADEMY

Copyright reserved

Downloaded from SEE academy: www.seeacademy.coza

3.6 A learner carried out three food tests on samples of peanuts, apple and potato.
The following table shows the results of the tests that were carried out.
On the table, a tick (✓) shows a positive result and a cross (x) shows a negative results.

TEST	CHEMICAL/ REAGENT	PEANUT	APPLE	POTATO
P	Iodine solution	✓	✓	✓
Q	Fehling's A and B OR Benedict's solution	X	✓	X
R	Ether OR alcohol	✓	X	X

3.6.1 Which type of food test was carried out at:

(a) **P** (1)

(b) **Q** (1)

(c) **R** (1)

3.6.2 What colour change would the learner observe at the end of testing:

(a) An apple sample in test **Q**? (1)

(b) A potato sample in test **P**? (1)

3.6.3 If a protein test was done on peanuts:

(a) Name the reagent/ chemical used to test it. (1)

(b) What colour would the learner observe in a positive test? (1)

(7)

TOTAL QUESTION 3: [50]

TOTAL SECTION B: 100
GRAND TOTAL: 150

SEE ACADEMY

Copyright reserved