

SMARTWIZ

GRADE10 LIFE SCIENCE EXAM

MARKS: 100

MARKS	

TIME: 2 hours

SCHOOL _____

CLASS (e.g. 4A) _____

SURNAME _____

NAME _____

Instructions for Learners:

- Read all the instructions carefully before you begin the exam.
- Write your name and learner number clearly on the answer sheet/booklet.
- Answer all the questions unless otherwise instructed.
- Show all your work/calculations where applicable.
- Write neatly and legibly.
- Use only blue or black ink. *Do not use correction fluid or tape.*
- No electronic devices (calculators, phones, etc.) are allowed unless explicitly permitted.
- Raise your hand if you have any questions.
- Do not talk to other learners during the exam.
- Any form of cheating will lead to disqualification.

This test consists of 6 pages including the cover page.

SECTION A: COMPULSORY (20 MARKS)**QUESTION 1: MULTIPLE CHOICE (10 x 1 = 10)**

Choose the correct answer and write only the letter (A-D) next to the question number.

1.1 Which part of the brain controls involuntary actions such as breathing?

- A. Cerebrum
- B. Medulla oblongata
- C. Cerebellum
- D. Spinal cord

1.2 Which organelle is responsible for photosynthesis in plant cells?

- A. Mitochondrion
- B. Vacuole
- C. Chloroplast
- D. Nucleus

1.3 Which blood vessel carries oxygenated blood from the lungs to the heart?

- A. Pulmonary artery
- B. Pulmonary vein
- C. Aorta
- D. Vena cava

1.4 Which part of the brain controls reflex actions?

- A. Cerebrum
- B. Medulla oblongata
- C. Cerebellum
- D. Pituitary gland

1.5 A sensory neuron carries impulses from the:

- A. Spinal cord to muscles
- B. Brain to glands
- C. Sense organ to spinal cord
- D. Brain to spinal cord

1.6 Which of the following helps regulate body temperature?

- A. Liver
- B. Pancreas
- C. Sweat glands
- D. Kidneys

1.7 The structure in the nephron where filtration of blood occurs is the:

- A. Loop of Henle
- B. Collecting duct
- C. Glomerulus
- D. Tubule

1.8 Which organ removes toxins and produces bile?

- A. Kidney
- B. Stomach
- C. Liver
- D. Pancreas

1.9 What is the function of the iris in the human eye?

- A. Focus light onto retina
- B. Detect colour
- C. Regulate amount of light entering the eye
- D. Protect the eyeball

1.10 Red blood cells carry:

- A. Nutrients
- B. Carbon dioxide
- C. Oxygen
- D. Waste

- 1.1 _____
- 1.2 _____
- 1.3 _____
- 1.4 _____
- 1.5 _____
- 1.6 _____
- 1.7 _____
- 1.8 _____
- 1.9 _____
- 1.10 _____

QUESTION 2: MATCHING ITEMS (5 x 1 = 5)

Match the items in Column A with the correct description in Column B. Write only the letter (A–E).

Column A	Column B
2.1 Cerebrum	A. Nephron filtration unit
2.2 Nephron	B. Controls thoughts and senses
2.3 Xylem	C. Light-sensitive layer in the eye

2.4 Retina	D. Transports water in plants
2.5 Trachea	E. Windpipe in respiratory system

2.1 _____

2.2 _____

2.3 _____

2.4 _____

2.5 _____

QUESTION 3: TRUE OR FALSE (5 x 1 = 5)

Write TRUE or FALSE. If the statement is false, correct it.

3.1 The stomach produces bile to help with digestion.

3.2 Capillaries have thick muscular walls.

3.3 Red blood cells carry oxygen in the blood.

3.4 Reflex actions are slow and involve thinking.

3.5 The cerebrum controls voluntary movements.

SECTION B: STRUCTURED QUESTIONS (40 MARKS)

QUESTION 4: CELLS & TISSUES (10 MARKS)

4.1 Define a tissue. (2)

4.2 Name two vascular tissues in plants and their functions. (4)

4.3 Draw a labelled diagram of a mitochondrion. Label any FOUR parts. (4)



QUESTION 5: TRANSPORT IN PLANTS (10 MARKS)

5.1 Define transpiration. (2)

5.2 List THREE environmental factors that affect transpiration. (3)

5.3 Explain TWO roles of transpiration in plants. (3)

5.4 Name ONE force that helps water move upward in xylem vessels. (2)

QUESTION 6: HUMAN RESPIRATION (10 MARKS)

6.1 Name THREE parts of the human respiratory system. (3)

6.2 Briefly explain the role of the diaphragm in breathing. (3)

6.3 Compare the composition of inhaled and exhaled air. (4)

QUESTION 7: HUMAN REPRODUCTION (10 MARKS)

7.1 Name the male and female sex cells. (2)

7.2 List TWO functions of the placenta. (2)

7.3 What is ovulation? (2)

7.4 Why is reproduction important? Give TWO reasons. (4)

SECTION C: ESSAY (40 MARKS)

Answer ONE of the following questions.

QUESTION 8: THE NERVOUS SYSTEM

Write an essay explaining the human nervous system. Include:

- Types of neurons and their roles
- Reflex arc with diagram
- Brain parts and their functions

- Importance of coordination

(Use the space below – at least one full page)

OR

QUESTION 9: HOMEOSTASIS AND EXCRETION

Write an essay about homeostasis and excretion. Include:

- Definition of homeostasis
- Organs involved in excretion
- Functions of the nephron
- Water and salt balance in the body

(Use the space below – at least one full page)

TOTAL: 100 MARKS

MEMO**SECTION A: MULTIPLE CHOICE, MATCHING, TRUE/FALSE (20 MARKS)**

QUESTION 1: MULTIPLE CHOICE ($10 \times 1 = 10$)

- 1.1 B – Control activities
- 1.2 C – Chloroplast
- 1.3 B – Pulmonary vein
- 1.4 B – Medulla oblongata
- 1.5 C – Sense organ to spinal cord
- 1.6 C – Sweat
- 1.7 C – Glomerulus
- 1.8 C – Liver
- 1.9 C – Regulate light entry
- 1.10 C – Oxygen

✓ [10 marks]

QUESTION 2: MATCHING ITEMS ($5 \times 1 = 5$)

- 2.1 B – Controls thought and senses
- 2.2 A – Kidney unit
- 2.3 D – Transports water in plants
- 2.4 C – Light-sensitive eye layer
- 2.5 E – Windpipe in respiratory system

✓ [5 marks]

QUESTION 3: TRUE/FALSE ($5 \times 1 = 5$)

- 3.1 **False** – *The liver produces bile, not the stomach.*
- 3.2 **False** – *Capillaries have thin walls (one cell thick).*
- 3.3 **True**
- 3.4 **False** – *A reflex action is fast and automatic.*
- 3.5 **True**

✓ [5 marks]

SECTION B: STRUCTURED QUESTIONS (40 MARKS)

QUESTION 4: CELLS & TISSUES (10 MARKS)

4.1 A tissue is a group of similar cells that perform a specific function. ✓ (2)

4.2

- Xylem – transports water
- Phloem – transports food ✓ (4)

4.3 Mitochondrion diagram labelled (any 4):

- Outer membrane
- Inner membrane
- Cristae
- Matrix

✓ (4 – 1 mark per correct label)

QUESTION 5: TRANSPORT IN PLANTS (10 MARKS)

5.1 Transpiration is the loss of water vapor from leaves through stomata. ✓ (2)

5.2

- Temperature
- Humidity
- Wind ✓ (3)

5.3 Helps with cooling, water movement, and nutrient transport. ✓ (3)

5.4 Capillarity or Transpiration pull or Cohesion-tension ✓ (2)

QUESTION 6: HUMAN RESPIRATORY SYSTEM (10 MARKS)

6.1 Any three: nose, trachea, bronchi, lungs ✓ (3)

6.2 Diaphragm contracts to allow air in and relaxes to push air out ✓ (3)

6.3

- Inhaled air: high O₂, low CO₂
- Exhaled air: low O₂, high CO₂ ✓ (4)

QUESTION 7: REPRODUCTION (10 MARKS)

7.1 Sperm and ovum (egg) ✓ (2)

7.2

- Nutrient and gas exchange

- Waste removal ✓ (2)
 - 7.3 Release of an ovum from the ovary ✓ (2)
 - 7.4
 - To ensure survival of species
 - To pass on genetic material ✓ (4)
-

SECTION C: ESSAY (40 MARKS)

Mark as follows:

QUESTION 8: THE NERVOUS SYSTEM

Expected points:

- Types of neurons: sensory, motor, interneuron
- Role of each
- Reflex arc with diagram
- Brain parts: cerebrum, cerebellum, medulla
- Importance of coordination and rapid responses

✓ Mark breakdown:

- Introduction (2–3)
- Content (25–30)
- Logical flow (5)
- Conclusion (2–3)

Total: 40

OR

QUESTION 9: HOMEOSTASIS AND EXCRETION

Expected points:

- Homeostasis definition
- Organs: kidneys (urea), lungs (CO₂), skin (sweat)
- Nephron structure and function: filtration, reabsorption, excretion
- Role of ADH, water balance

✓ Mark breakdown:

- Introduction (2–3)
- Content (25–30)

- Logical flow (5)
 - Conclusion (2–3)
- Total: 40**

■ **TOTAL: 100 MARKS**

