

# 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: MULTIPLE CHOICE, MATCHING, AND TRUE/FALSE (20 MARKS)**

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**QUESTION 1: MULTIPLE CHOICE QUESTIONS (10 × 1 = 10)**

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

1.1 The basic structural and functional unit of life is the:

- A. Tissue B. Organelle C. Cell D. Nucleus

**Answer:** \_\_\_\_\_

1.2 Which structure is responsible for photosynthesis?

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

**Answer:** \_\_\_\_\_

1.3 Which part of the human brain controls balance and coordination?

- A. Cerebrum B. Medulla oblongata C. Cerebellum D. Hypothalamus

**Answer:** \_\_\_\_\_

1.4 Which component of blood helps with clotting?

- A. White blood cells B. Red blood cells C. Platelets D. Plasma

**Answer:** \_\_\_\_\_

1.5 The site of gas exchange in the lungs is called:

- A. Trachea B. Bronchi C. Alveoli D. Bronchioles

**Answer:** \_\_\_\_\_

1.6 What is the function of the xylem?

- A. Transport water  
B. Transport food  
C. Store energy  
D. Produce hormones

**Answer:** \_\_\_\_\_

1.7 Which organ is part of the digestive and endocrine system?

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

**Answer:** \_\_\_\_\_

1.8 The process of meiosis results in:

- A. Identical body cells  
B. Genetically different gametes  
C. Mitosis  
D. Doubling of chromosomes

**Answer:** \_\_\_\_\_

1.9 Homeostasis refers to:

- A. Movement of substances in the cell
- B. Maintaining internal stability
- C. Digestion of nutrients
- D. Circulation of blood

**Answer:** \_\_\_\_\_

1.10 The part of the eye that controls the amount of light entering is the:

- A. Cornea B. Retina C. Iris D. Lens

**Answer:** \_\_\_\_\_

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

Match Column A with Column B:

Column A	Column B
2.1 Mitochondria	A. Transports nutrients and hormones
2.2 Plasma	B. Site of respiration
2.3 Enzyme	C. Detects light
2.4 Retina	D. Speeds up reactions
2.5 Tricuspid valve	E. Found between right atrium and ventricle

2.1 \_\_\_\_\_

2.2 \_\_\_\_\_

2.3 \_\_\_\_\_

2.4 \_\_\_\_\_

2.5 \_\_\_\_\_

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

Indicate whether each statement is TRUE or FALSE. If false, rewrite the correct statement.

3.1 The phloem transports water and minerals from roots to leaves.

3.2 The diaphragm plays a major role in breathing.

3.3 The cerebrum controls voluntary actions.

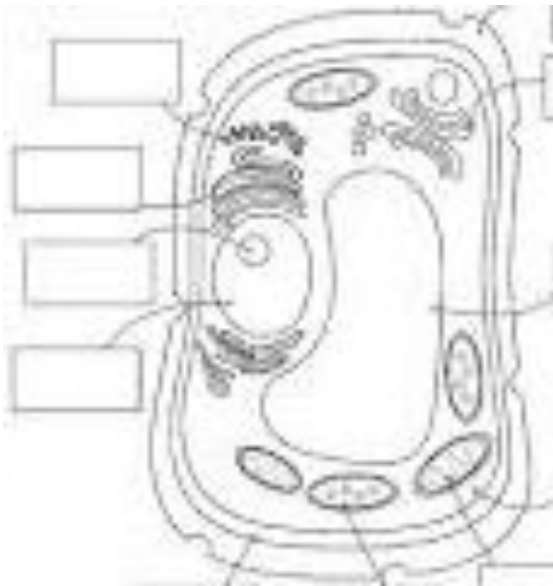
3.4 Hormones are produced by glands in the endocrine system.

3.5 The nephron is the functional unit of the liver.

**SECTION B: STRUCTURED QUESTIONS (40 MARKS)**

**QUESTION 4: CELL STRUCTURE AND FUNCTIONS (10 MARKS)**

4.1 Label the diagram of a plant cell provided below. (4)



4.2 State two differences between plant and animal cells. (4)

4.3 Which organelle is involved in protein synthesis? (2)

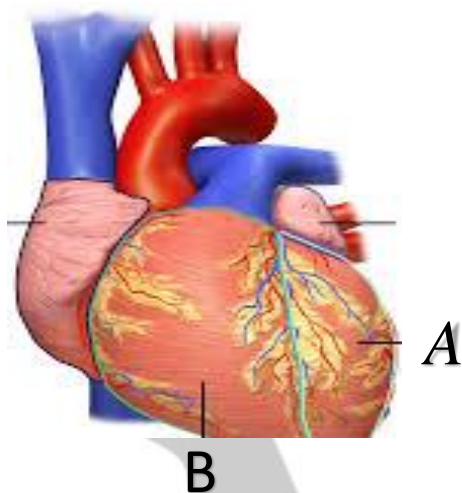
**QUESTION 5: HUMAN CIRCULATORY SYSTEM (10 MARKS)**

5.1 Name the three types of blood vessels. (3)

5.2 State two functions of the circulatory system. (2)

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5.3 Identify the chambers labelled A and B in the heart diagram below. (2)



5.4 Name the blood component responsible for oxygen transport. (1)

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5.5 What is hypertension? (2)

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### QUESTION 6: PHOTOSYNTHESIS & RESPIRATION (10 MARKS)

6.1 Write the word equation for photosynthesis. (2)

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6.2 Name two raw materials needed for photosynthesis. (2)

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6.3 Explain the importance of chlorophyll. (2)

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6.4 How is energy released from glucose in the mitochondria? (2)

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6.5 Which gas is produced during aerobic respiration? (2)

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### QUESTION 7: NERVOUS SYSTEM AND COORDINATION (10 MARKS)

7.1 Define a reflex action. (2)

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7.2 Draw and label a simple reflex arc. (4)



7.3 State two functions of the central nervous system. (2)

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7.4 What is the role of synapses? (2)

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### SECTION C: ESSAY QUESTION (40 MARKS)

Answer **ONE** question.

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### QUESTION 8: HUMAN REPRODUCTION

Write an essay on human reproduction. Include the following:

- Male and female reproductive organs
  - Menstrual cycle
  - Fertilisation and pregnancy
  - Prevention of pregnancy
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**OR**

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**QUESTION 9: EXCRETION IN HUMANS**

Write an essay on excretion in humans. Include:

- Definition of excretion
  - Organs involved in excretion (lungs, kidneys, skin)
  - Structure and function of a nephron
  - Importance of maintaining water balance
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■ **TOTAL: 100 MARKS**



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

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

- 1.1 C – Cell
- 1.2 B – Chloroplast
- 1.3 C – Cerebellum
- 1.4 C – Platelets
- 1.5 C – Alveoli
- 1.6 A – Transport water
- 1.7 B – Pancreas
- 1.8 B – Genetically different gametes
- 1.9 B – Maintaining internal stability
- 1.10 C – Iris

✓ [10 marks]

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

- 2.1 B – Site of respiration
- 2.2 A – Transports nutrients and hormones
- 2.3 D – Speeds up reactions
- 2.4 C – Detects light
- 2.5 E – Found between right atrium and ventricle

✓ [5 marks]

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

- 3.1 **False** – *The xylem transports water and minerals; phloem transports food.*
- 3.2 **True**
- 3.3 **True**
- 3.4 **True**
- 3.5 **False** – *The nephron is the functional unit of the kidney.*

✓ [5 marks]

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## SECTION B: STRUCTURED QUESTIONS (40 MARKS)

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### QUESTION 4: CELL STRUCTURE & FUNCTION (10 MARKS)



4.1 Any four of the following labelled correctly:

- Cell wall
- Nucleus
- Vacuole
- Cytoplasm
- Chloroplast

✓ (4)

4.2 Any two differences (any  $2 \times 2$ ):

- Plant cells have a cell wall; animal cells do not.
- Plant cells have chloroplasts; animal cells do not.
- Plant cells have a large vacuole; animal cells have small vacuoles.

✓ (4)

4.3 Ribosome

✓ (2)

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### QUESTION 5: CIRCULATORY SYSTEM (10 MARKS)

5.1 Arteries, veins, capillaries

✓ (3)

5.2

- Transport oxygen and nutrients
- Remove carbon dioxide and waste

✓ (2)

5.3

- A: Right atrium
- B: Left ventricle

✓ (2)

5.4 Red blood cells

✓ (1)

5.5 High blood pressure (above normal range)

✓ (2)

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### QUESTION 6: PHOTOSYNTHESIS & RESPIRATION (10 MARKS)

6.1 Carbon dioxide + water → glucose + oxygen

✓ (2)

6.2

- Carbon dioxide
- Water

✓ (2)

6.3 Chlorophyll traps sunlight energy for photosynthesis

✓ (2)

6.4 Through aerobic respiration which breaks glucose using oxygen to release ATP

✓ (2)

6.5 Carbon dioxide

✓ (2)

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### QUESTION 7: NERVOUS SYSTEM (10 MARKS)

7.1 Automatic, involuntary response to a stimulus

✓ (2)

7.2 Simple diagram showing:

- Receptor
- Sensory neuron
- Spinal cord
- Motor neuron
- Effector

✓ (4 – 1 mark per correct label)

7.3

- Coordinates voluntary actions
- Transmits nerve impulses

✓ (2)

7.4 Allow impulses to pass between neurons and help control direction

✓ (2)

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### ■ SECTION C: ESSAY QUESTION (40 MARKS)

Award marks as follows:

- **Introduction:** 2–3 marks
  - **Content (body):** 25–30 marks
    - Use facts, explanations, and examples
    - Award 2–3 marks per well-explained point
  - **Conclusion:** 2–3 marks
  - **Logical flow/Structure:** 4–5 marks
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### QUESTION 8: HUMAN REPRODUCTION (40 MARKS)

Expected content:

- Reproductive organs: testes, penis, ovaries, uterus
- Menstrual cycle: phases, hormones
- Fertilisation process
- Pregnancy and implantation
- Contraception (prevention)

✓ OR

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### QUESTION 9: EXCRETION IN HUMANS (40 MARKS)

Expected content:

- Definition of excretion
- Organs: lungs (CO<sub>2</sub>), skin (sweat), kidneys (urea)
- Nephron structure: Bowman's capsule, loop of Henle, collecting duct
- Function: filtration, reabsorption
- Water balance: ADH, osmoregulation

✓ [40 marks]

**TOTAL : 100**