SMARTWIZ

GRADE11 LIFE SCIENCE EXAM

MARKS: 100

MARKS	

TIME: 2 HOURS

SCHOOL _____

CLASS (eg. 4A) _____

SURNAME _____

NAME _____

Instructions for Learners:

- Read all instructions carefully before you begin the exam.
- Write your full name and student number clearly on the answer sheet/book.
- Answer all questions unless otherwise instructed.
- Show all your work/calculations where necessary.
- Write neatly and clearly.
- Use only a blue or black pen. Do not use correction fluid or tape.
- Electronic devices (calculators, cell phones, etc.) are not 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 result in immediate disqualification from the exam.

This exam consists of six pages, including the cover page.

SECTION A: MULTIPLE CHOICE & DEFINITIONS (20 marks)

QUESTION 1: MULTIPLE CHOICE (5 × 1 = 5 marks)

Choose the correct answer and write only the letter.

1.1 What organelle is known as the "powerhouse of the cell"?
A) Nucleus
B) Mitochondrion
C) Ribosome
D) Golgi apparatus

1.2 Which process produces gametes?
A) Mitosis
B) Meiosis
C) Fertilisation
D) Binary fission

1.3 What is the main function of xylem tissue in plants?
A) Transport sugars
B) Transport water
C) Photosynthesis
D) Store starch

1.4 Which blood cells help fight infections?
A) Red blood cells
B) Platelets
C) White blood cells
D) Plasma

1.5 What type of biomolecule are enzymes?
A) Lipids
B) Carbohydrates
C) Proteins
D) Nucleic acids

QUESTION 2: DEFINITIONS (5 × 1 = 5 marks)

Write a clear definition for each term:

2.1 Homeostasis

2.2 DNA replication

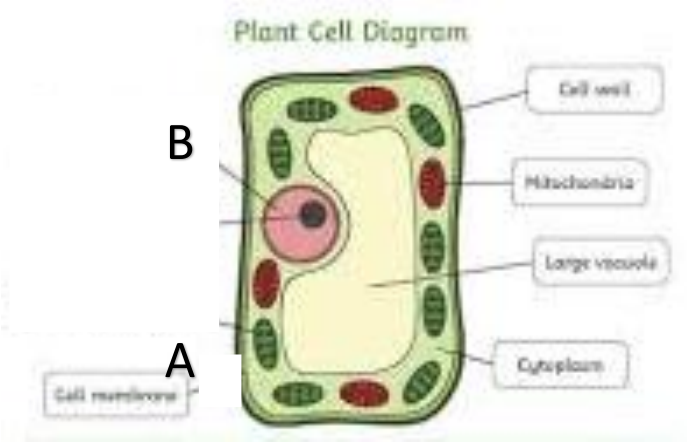
2.3 Ecosystem

2.4 Enzyme specificity

2.5 Genetic mutation

SECTION B: DIAGRAMS & DATA INTERPRETATION (30 marks)

QUESTION 3: CELL STRUCTURE (10 marks)



3.1 Name the organelle labelled “A”.

3.2 What is the function of the organelle labelled “B”?

3.3 Explain why plant cells have a cell wall.

3.4 Name the organelle responsible for photosynthesis.

3.5 How is the vacuole important for maintaining cell structure?

QUESTION 4: GENETICS (10 marks)

Study the Punnett square below for a cross between two heterozygous tall pea plants (Tt × Tt):

	T	**t**
T	TT	Tt
t	Tt	tt

4.1 What is the genotype ratio?

4.2 What is the phenotype ratio?

4.3 Which genotype represents the homozygous recessive condition?

4.4 What percentage of offspring will be tall?

4.5 Explain why the “tt” plants are short.

QUESTION 5: ECOLOGY (10 marks)

Look at the food web below:

grass → grasshopper → frog → snake → hawk

5.1 Identify the primary producer.

5.2 Name two primary consumers in this food web.

5.3 Which organism is the apex predator?

5.4 Explain the role of decomposers in an ecosystem.

5.5 What might happen if the snake population decreases drastically?

SECTION C: ESSAY (30 marks)

QUESTION 6: ESSAY ON HUMAN IMPACT ON BIODIVERSITY

Write an essay (250–300 words) on:

"The impact of human activities on biodiversity and ways to conserve ecosystems."

Include:

- Examples of human activities harming biodiversity
- Consequences for ecosystems
- Conservation methods
- Why biodiversity is important for human survival

🛑 **END OF EXAM**

TOTAL : 100

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SECTION A: MULTIPLE CHOICE & DEFINITIONS (20 marks)

Question 1: Multiple Choice (5 × 1 = 5 marks)

1.1 B – Mitochondrion is the powerhouse of the cell.
1.2 B – Meiosis produces gametes.
1.3 B – Xylem transports water in plants.
1.4 C – White blood cells fight infections.
1.5 C – Enzymes are proteins.

[5 marks]

Question 2: Definitions (5 × 1 = 5 marks)

2.1 Homeostasis: The maintenance of a stable internal environment despite changes in the external environment.
2.2 DNA replication: The process by which DNA makes a copy of itself during cell division.
2.3 Ecosystem: A community of living organisms interacting with each other and their non-living environment.
2.4 Enzyme specificity: The property that enzymes catalyze only one specific reaction or act on a specific substrate.
2.5 Genetic mutation: A change in the DNA sequence that can result in variation.

[5 marks]

SECTION B: DIAGRAMS & DATA INTERPRETATION (30 marks)

Question 3: Cell Structure (10 marks)

3.1 Organelle A: Chloroplast
3.2 Function of organelle B (e.g., nucleus): Controls cell activities and contains genetic material (DNA).
3.3 Plant cells have a cell wall to provide structural support and protect the cell.
3.4 Organelle responsible for photosynthesis: Chloroplast
3.5 Vacuole maintains cell structure by storing water and maintaining turgor pressure.

[10 marks]

Question 4: Genetics (10 marks)

4.1 Genotype ratio: 1 TT : 2 Tt : 1 tt
4.2 Phenotype ratio: 3 tall : 1 short
4.3 Homozygous recessive genotype: tt
4.4 Percentage of tall offspring: 75% (TT and Tt combined)
4.5 “tt” plants are short because the recessive alleles do not produce the dominant tall trait.

[10 marks]

Question 5: Ecology (10 marks)

5.1 Primary producer: Grass
5.2 Primary consumers: Grasshopper, Frog (if frog feeds mainly on grasshoppers) — but mainly Grasshopper, and possibly Frog if considered primary consumer (otherwise frog is secondary consumer)
5.3 Apex predator: Hawk
5.4 Role of decomposers: Break down dead organisms and recycle nutrients back into the ecosystem.
5.5 If snake population decreases drastically, the frog population might increase, leading to imbalance and possible overconsumption of grasshoppers.

[10 marks]

SECTION C: ESSAY (30 marks)

Question 6: Business Ethics and CSR

Marking guide:

Aspect	Marks	Notes
Introduction & definitions	5	Define biodiversity and human impact
Examples of harmful activities	7	Deforestation, pollution, habitat destruction
Consequences for ecosystems	6	Loss of species, ecosystem imbalance
Conservation methods	6	Protected areas, reforestation, legislation
Importance of biodiversity	6	Ecosystem services, medicine, food security

Total: 30 marks

Total for Paper: 100 marks