REPUBLIC OF ZAMBIA
MINISTRY OF EDUCATION

COMPETENCE BASED ASSESSMENTS (CBA)

AGRICULTURAL SCIENCE — 4018

Examination for Certificate of Secondary Education Ordinary Level (ECSEOL)

Component 1: School Based Assessment — Form 2 and Form 3
Component 2: Final Examination — Form 4

Set in accordance with the ECZ Assessment Scheme for Agricultural Science (4018), 2026
and the Agricultural Science Syllabus, Secondary Education Ordinary Level, Form 1–4 (CDC, 2024)

For complete and editable SBAs WhatsApp 0978484441

1. Overview of the Assessment

Construct

Applies scientific skills for sustainable food production and entrepreneurship.

Elements of Construct (EoC)

- EoC 1 — Investigates agricultural scientific problems through observations, measurement, experimentation and recording.
- EoC 2 — Demonstrates practical skills in managing crops for improved yields.
- EoC 3 — Applies practical skills in managing livestock for improved production.
- EoC 4 — Analyses data and applies sustainable scientific techniques for improved productivity.
- EoC 5 — Applies agribusiness and entrepreneurship skills in managing farm enterprises.
- EoC 6 — Investigates agricultural problems and demonstrates practical skills in real life situations.

Test Design

Component	Level	Number of tasks	Marks	Duration
Component 1 — School Based Assessment	Form 2	6	100	1 year
Component 1 — School Based Assessment	Form 3	6	100	1 year
Component 2 — Final Examination	Form 4	5 items / 10 tasks	60	2 hours

Weighting: School Based Assessment 30% : Final Examination 70%.

Each SBA task below is written as a scenario grounded in the Luapula Province/Kawambwa District farming context, mapped to a Specific Competence in the Form 1–4 syllabus and an Element of Construct, with a marking guide. The Field Project (Form 2) and Comparative Research (Form 3) are included as required by the scheme. The Final Examination section follows the Test Specification exactly: five compulsory scenario-based items, one on each of EoC 1–5, totalling 60 marks in 2 hours.

For complete and editable SBAs WhatsApp 0978484441

2. School Based Assessment — Component 1, Form 2 (100 marks)

Task 1 — Term 1 Class Test [15 marks — Class Test]

Term	Term 1
Element of Construct	EoC 1 — Investigates agricultural scientific problems through observations, measurement, experimentation and recording.
Specific Competence(s)	1.1.1.1; 2.2.1.1; 2.3.1.1
Competence assessed	Investigates the causes of poor crop performance using knowledge of nutrient cycles and climate.
Key Competences	Analytical Thinking; Environmental Sustainability

Scenario

Mutono Secondary School has a demonstration garden that has been cropped continuously for five seasons without any fertiliser or manure application. Over the past two seasons, the Agriculture Club has observed that maize planted in this garden grows poorly and has pale yellow leaves, while maize in a nearby garden that receives goat manure every season grows well. The club patron has asked Form 2 learners to investigate and explain the problem.

Tasks

(a) Using the nitrogen cycle, explain why continuous cropping without replenishing nutrients has caused the maize in the school garden to develop pale yellow leaves. **[5]**

(b) Describe two ways the club could investigate whether nutrient depletion, rather than another factor, is the actual cause of the poor growth. **[4]**

(c) Explain how changing climate patterns in Luapula Province, such as unpredictable rainfall, could make this nutrient problem worse in coming seasons. **[6]**

[Total: 15 Marks]

Marking Guide

- (a) Nitrogen is a mobile nutrient removed from the soil by continuous cropping without replacement; plants take up nitrogen as nitrates for chlorophyll and protein synthesis; depletion of nitrogen means less chlorophyll is formed, causing pale yellow leaves (chlorosis); continuous cropping without return of nitrogen through manure, fertiliser or legumes drains the soil's nitrogen pool over time. Award any 5 well-reasoned points.
- (b) Soil testing/wet chemical tests for nitrate or ammonium ions to confirm nutrient levels (2 marks); a comparative trial — planting maize with and without manure/fertiliser in the same garden under the same conditions and comparing growth (2 marks). Accept other valid investigative methods such as leaf tissue analysis.
- (c) Erratic/unpredictable rainfall increases leaching of already-scarce nutrients (2); dry spells stress plants, reducing nutrient uptake efficiency (2); more frequent heavy rain events wash away topsoil and nutrients through erosion (2). Award any 3 well-explained points, 2 marks each.

Level of Difficulty

(a) Understanding, (b) Application, (c) Analysis/Evaluation

For complete and editable SBAs WhatsApp 0978484441

Task 2 — Term 1 Assignment [15 marks — Assignment]

Term	Term 1
Element of Construct	EoC 2 — Demonstrates practical skills in managing crops for improved yields.
Specific Competence(s)	2.5.1.1; 2.5.2.1
Competence assessed	Applies knowledge of plant morphology and germination requirements to manage a cereal crop.
Key Competences	Problem Solving; Communication

Scenario

A Form 2 learner at Mutono Secondary School planted maize seed in the school field in October, but three weeks later fewer than half the seeds had germinated, and the seedlings that emerged were weak and unevenly spaced. The Agriculture teacher has asked the learner to write a short report diagnosing the problem and proposing a management plan for the remaining season.

Term	

For complete and editable SBAs WhatsApp 0978484441

Element of Construct	
Specific Competence(s)	
Competence assessed	
Key Competences	

Term	
Element of Construct	

For complete and editable SBAs WhatsApp 0978484441

Specific Competence(s)	
Competence assessed	
Key Competences	

Term	
Element of Construct	
Specific Competence(s)	

For complete and editable SBAs WhatsApp 0978484441

Competence assessed	
Key Competences	

Method	Hectares prepared per week	Cost per hectare (ZMW)	Average maize yield (bags/ha)

For complete and editable SBAs WhatsApp 0978484441

Term	
Element of Construct	
Specific Competence(s)	

Assessment Criterion	Marks

For complete and editable SBAs WhatsApp 0978484441

For complete and editable SBAs WhatsApp 0978484441

Term	
Element of Construct	
Specific Competence(s)	
Competence assessed	
Key Competences	

For complete and editable SBAs WhatsApp 0978484441

Term	
Element of Construct	
Specific Competence(s)	
Competence assessed	
Key Competences	

Term	
Element of Construct	

For complete and editable SBAs WhatsApp 0978484441

Specific Competence(s)	
Competence assessed	
Key Competences	

Term	
Element of Construct	
Specific Competence(s)	

For complete and editable SBAs WhatsApp 0978484441

Competence assessed	
Key Competences	

Term	
Element of Construct	
Specific Competence(s)	

For complete and editable SBAs WhatsApp 0978484441

Competence assessed	
Key Competences	

Term	
Element of Construct	
Specific Competence(s)	

For complete and editable SBAs WhatsApp 0978484441

Assessment Criterion	Marks

For complete and editable SBAs WhatsApp 0978484441

Element of Construct	
Specific Competence(s)	
Competence assessed	
Key Competences	

Practice	Number of farmers using it	Average yield (bags/ha)

For complete and editable SBAs WhatsApp 0978484441

Element of Construct	
Specific Competence(s)	
Competence assessed	
Key Competences	

For complete and editable SBAs WhatsApp 0978484441

Element of Construct	
Specific Competence(s)	
Competence assessed	
Key Competences	

Element of Construct	
Specific Competence(s)	

For complete and editable SBAs WhatsApp 0978484441

Competence assessed	
Key Competences	

Season type	Average ha planted on time	Average yield (bags/ha)	Running cost (ZMW/season)

For complete and editable SBAs WhatsApp 0978484441

Element of Construct	
Specific Competence(s)	
Competence assessed	
Key Competences	

For complete and editable SBAs WhatsApp 0978484441

Learner	Form 2 raw mark (/100)	Form 3 raw mark (/100)	Form 2 weighted (/15)	Form 3 weighted (/15)	Total SBA (/30)

For complete and editable SBAs WhatsApp 0978484441