Candidate Name	Centre Number	Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Advanced Level

CROP SCIENCE 6049/3

PAPER 3 Practical Test

SPECIMEN PAPER 2 hours 30 minutes

Additional materials:
Answer paper,
Graph paper,
As listed in Instructions to Supervisors,
Scientific Calculator.

TIME 2 hours 30 minutes + 10 minutes preparation time.

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces at the top of this page and on every page of your answer paper.

This paper consists of **three** questions. Answer **all** questions. The number of marks is given in brackets [ ] at the end of each question or part question.

You are advised to spend the first **10** minutes carefully reading through the whole paper before answering any questions. Spend at least **40** minutes on each question. All writing must be in blue or black ink except for diagrams which must be drawn in pencil.
You are reminded of the need for good English and clear presentation in your answers.

FOR EXAMINER'S USE	
1	
2	
3	
TOTAL	

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[Turn over

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1. **CS1** is a dry soil sample
Place the dry soil into a measuring cylinder, shake it down gently until it comes up to **30cm^3**.
Pour **30cm^3** of distilled water into the measuring cylinder with soil.
Shake gently or stir until all the soil is wet.

(a) Read the final level of water in the cylinder after **10 minutes** and record your observations.

_____

_____

_____

_____ [4]

(b) State the soil component being investigated

_____ [1]

(c) Calculate the percentage of the component being investigated

_____

_____

_____

_____

_____ [3]

(d) Explain the significance of the component being investigated in the soil.

_____

_____

_____

_____

_____

_____

_____ [5]

(e) How can a farmer manage his/her soil to improve the availability of the component being investigated?

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_____ [4]

(f) Besides the component under investigation, state any other **three** soil components.

_____

_____

_____

_____

_____ [3]

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2 **(a)** **CS2** and **CS3** are fertiliser samples.
You are required to determine the behaviour of the fertilisers when placed on soil surface on a rainy day.

Proceed as follows:

Weigh **40 g** of the soil sample provided.
Place into a filter fitted funnel.
Place over a **50 ml** measuring cylinder.
Prepare **three** sets of this set up and label them **A**, **B** and **C**.
Weigh **10g** of **CS2** and place on top of the soil in **B**. Repeat the process with **CS3** and put in **C**.

Pour **40ml** of distilled water gently over all the **three** set ups.
Record your observations during the pouring of the distilled water and after **10 minutes.**

(i) Observations

_____

_____

_____

_____

_____ [3]

(ii) Measure the pH of filtrates **B** and **C**.

_____

_____

_____

_____

_____ [2]

(iii) Comment on the results obtained in **(i)** and **(ii)**.

_____

_____

_____

_____

_____ [3]

(iv) From the observations on the behaviour of the fertilizers, suggest suitable management practices when using **CS2** and **CS3** fertilizers.

_____

_____

_____

_____

_____ [2]

(v) What are the long term effects of using high amounts of **CS2** and **CS3** to the soil environment?

_____

_____

_____

_____

_____ [2]

(b) If the application rate of **CS2** is **20g** per planting station in maize production, how much of **CS2** would you require for a **hectare** plot using a plant spacing of **30cm** by **90cm**?

_____

_____

_____

_____

_____ [3]

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(c) Justify the use of **CS2** and **CS3** fertiliser types over organic fertilizers in crop production.

_____

_____

_____

_____

_____ [2]

(d) Outline ways by which **CS2** and **CS3** fertilizers are lost from the soil.

_____

_____

_____

_____

_____

_____

_____ [3]

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3 **(a)** You are required to investigate water loss from leaves of plants.

Proceed as follows:

Detach a leaf from **CS4** and weigh immediately.
Place the leaf on a white tile and place where air blown by a fan reaches.
Weigh the leaf again at **5 minutes** interval for the next **25 minutes** and record the mass of the leaf at each stage in the table below.

(i)

Time (mins)		**Mass (g)**
Start	0	
	5	
	10	
	15	
	20	
End	25	

[6]

(ii) Using an appropriate scale, plot the graph of **mass (g)** versus **time (minutes)**.

[4]

(iii) What conclusion can you draw from the graph?

_____

_____

_____

_____ [2]

(iv) Outline any **two** environmental factors that can affect crop water loss. [2]

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(b) Suggest how farmers can minimise water loss during harvesting, storage and marketing of leaf crops. [6]