Candidate Name	Centre Number	Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Advanced Level

CROP SCIENCE 6049/2

PAPER 2

SPECIMEN PAPER 2 hours

Additional materials:
Answer paper,
Scientific calculator.

TIME 2 hours

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces provided at the top of this page and on all separate answer paper used.

Section A

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

Section B

Answer any **two** questions.

Write your answers on the separate answer paper provided.

At the end of the examination, fasten the separate answer paper securely to the question paper.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [ ] at the end of each question or part question.

You are advised to spend no longer than **80 minutes** on Section A.

FOR EXAMINER'S USE	
Section A	
Section B	
TOTAL	

This question paper consists of 9 printed pages and 3 blank pages.

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Section A (60 marks)

For Examiner's Use

Answer all questions.

1 **(a)** Describe the functions of the following cell organelles:

(i) mitochondria,

_____

_____

_____ [2]

(ii) chloroplasts,

_____

_____

_____ [2]

(iii) ribosomes.

_____

_____

_____ [2]

(b) Differentiate between mitosis and meiosis

_____

_____

_____

_____

_____

_____ [4]

For Examiner's Use

2 **(a)** Describe the following routes of water uptake by plants:

(i) Apoplast pathway,

_____

_____

_____

_____ [3]

(ii) Symplast pathway.

_____

_____

_____

_____ [3]

(b) Describe the following components of water potential:

(i) pressure potential,

_____

_____

_____ [2]

(ii) osmotic potential.

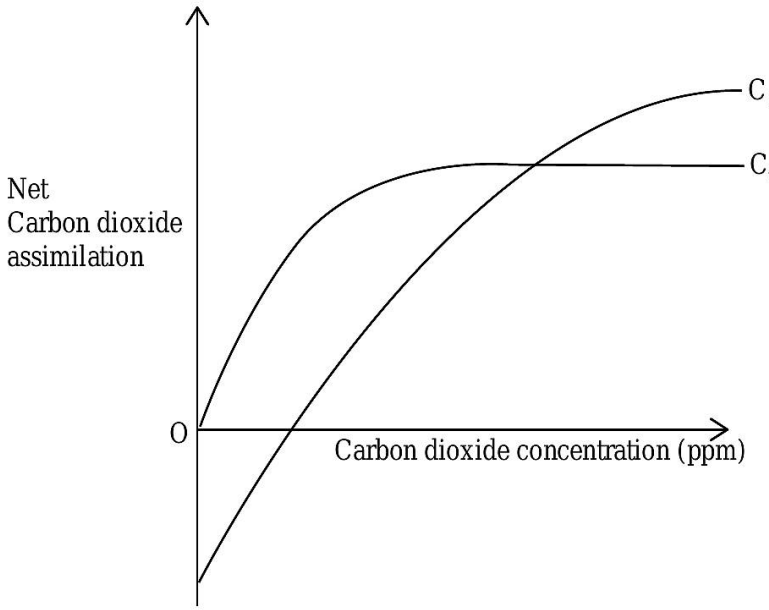
_____

_____

_____ [2]

For Examiner's Use

3 **(a)** The diagram below shows the rate of photosynthesis in C_3 and C_4 plants relative to carbon dioxide concentration.



On the diagram, indicate the carbon dioxide compensation point for:

(i) C_3 plants,

(ii) C_4 plants. [2]

(iii) Explain the difference in net carbon dioxide assimilation between C_3 and C_4 plants with increase in carbon dioxide concentration.

_____

_____

_____

_____ [3]

For Examiner's Use

(b) Discuss how C_4 plants are adapted to hot, dry and bright sunlight conditions?

_____

_____

_____ [2]

(c) Outline the three stages involved in aerobic respiration.

(i) _____

(ii) _____

(iii) _____ [3]

4 **(a)** With the aid of diagram, illustrate the soil catena effect.

For Examiner's Use

_____

_____

_____

_____

_____

_____ [4]

(b) Explain how soil structure varies with the location on the soil catena.

_____

_____

_____ [2]

(c) Describe how the bulk density of a soil sample is determined in a laboratory.

_____

_____

_____

_____ [4]

5 **(a)** Describe how the **carbon: nitrogen** (C:N) ratio influences the rate of decomposition of organic matter.

_____

_____

_____

_____

_____ [4]

For Examiner's Use

(b) Outline the role of soil macro-organism.

_____

_____

_____

_____ [3]

(c) Explain the importance of **cation exchange capacity** (C.E.C) in soil fertility.

_____

_____

_____

_____

_____ [3]

6 **(a)** Outline the significance of practicing conservation farming in crop production.

_____

_____

_____

_____

_____

_____

_____[4]

(b) Describe the following conservation farming practices:

(i) Strip tillage,

_____

_____

_____ [2]

(ii) Ridge tillage,

_____

_____

_____ [2]

(iv) Minimum tillage.

_____

_____

_____ [2]

For Examiner's Use

Section B (40 marks)

Answer any **two** questions.

7 **(a)** Discuss the implications of high plant population in crop production. [10]

(b) Suggest factors that can be considered when selecting a crop variety to grow. [10]

8 Explain the production of a named cereal crop under the following headings:

(i) Cultivar selection, [4]

(ii) Climatic and soil requirements, [6]

(iii) Planting methods, [6]

(iv) Harvesting indices. [4]

9 **(a)** Describe the criteria used to divide Zimbabwe into agroecological zones. [5]

(b) Discuss how agricultural activities are influenced by environmental conditions in the listed agro-ecological zone:

(i) Agroecological zone 1, [5]

(ii) Agroecological zone 3, [5]

(iii) Agroecological zone 4. [5]

10 **(a)** Outline the mechanisms that make weeds persistent in crop production. [10]

(b) Suggest strategies that farmers can adopt to manage weed populations in arable lands. [10]

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