

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

|                  |   |
|------------------|---|
| <b>Section A</b> |   |
| <b>Section B</b> | / |
|                  |   |
|                  |   |
| <b>TOTAL</b>     |   |

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

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**Section A (60 marks)**For  
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Answer all questions.

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

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[2]

**(ii)** chloroplasts,

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[2]

**(iii)** ribosomes.

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[2]

**(b)** Differentiate between mitosis and meiosis

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[4]

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

**(i)** Apoplast pathway,

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[3]

**(ii)** Symplast pathway.

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[3]

**(b)** Describe the following components of water potential:

**(i)** pressure potential,

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[2]

**(ii)** osmotic potential.

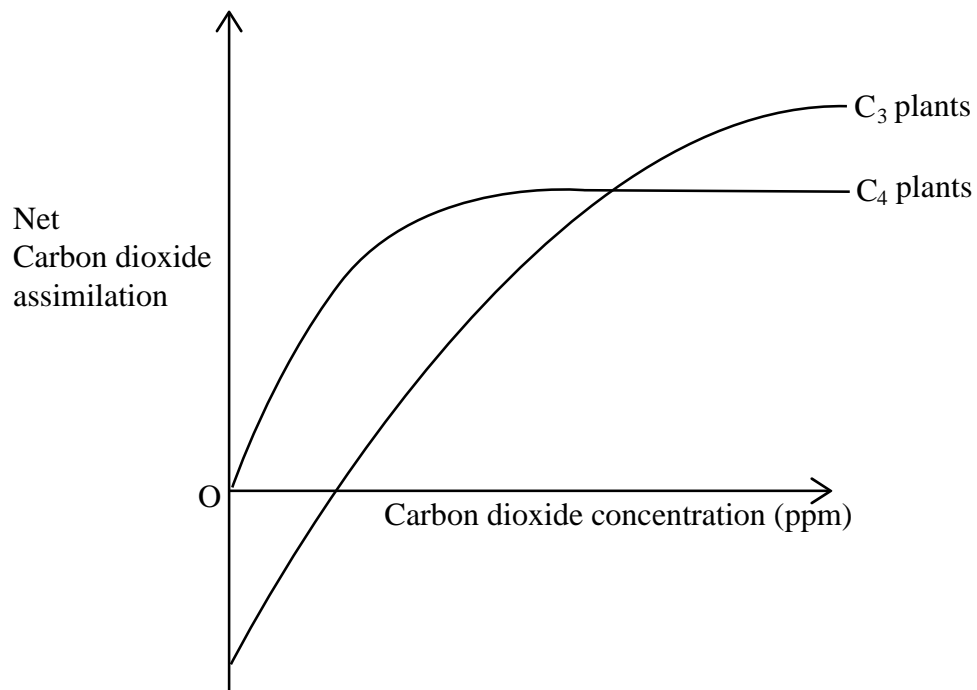
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[2]

- 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.

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[3]

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

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[2]

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

(i) 

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(ii) 

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(iii) 

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[3]

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

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[4]

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

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[2]

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

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[4]

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

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[4]

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

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[3]

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

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[3]

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

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[4]

**(b)** Describe the following conservation farming practices:

**(i)** Strip tillage,

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[2]

**(ii)** Ridge tillage,

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[2]

**(iv)** Minimum tillage.

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[2]

For  
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**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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