This question paper consists of 14 pages.
INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions:

1. Answer ALL the questions.
2. Answer Section A (QUESTION 1) on the attached ANSWER SHEET.
3. Answer Section B (QUESTIONS 2, 3 and 4) in the ANSWER BOOK.
4. Read all the questions carefully and make sure you answer only what is asked.
5. Number the answers correctly according to the numbering system used in this question paper.
6. Place the completed ANSWER SHEET for SECTION A (QUESTION 1) inside the ANSWER BOOK.
7. You may use a non-programmable calculator and appropriate mathematical instruments.
8. Please write neatly – we cannot mark illegible handwriting.
9. Any student caught cheating will have his or her examination paper and notes confiscated. The College will take disciplinary measures to protect the integrity of these examinations.
10. If there is something wrong with or missing from your question paper or your answer book, please inform your invigilator immediately. If you do not inform your invigilator about a problem, the College will not be able to rectify it afterwards, and your marks cannot be adjusted to allow for the problem.
11. This question paper may be removed from the examination hall after the examination has taken place.

This question paper consists of TWO sections: Section A and Section B. Answer ALL the questions.

<table>
<thead>
<tr>
<th>Question</th>
<th>Section</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A: ONE question</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Answer the question</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>B: THREE questions</td>
<td>105</td>
</tr>
<tr>
<td>3</td>
<td>Answer ALL the questions</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL MARKS:</strong></td>
<td></td>
<td><strong>150</strong></td>
</tr>
</tbody>
</table>

**NOTE:** An answer sheet has been attached at the back of the question paper. Fill in your name and student number in the appropriate spaces, detach it from your question paper and place inside your answer book.
QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and make a cross (X) in the block (A. – D.) next to the question number (1.1.1 – 1.1.10) on the attached answer sheet.

EXAMPLE:

1.1.1 The structure involved in the selective absorption of substances in plant cells, is called:

A. the leucoplast.
B. the chloroplast.
C. the chromoplast.
D. the tonoplast.

1.1.2 When a soil sample is taken, the most important factor to remember is that the sample must:

A. weigh 2 kg.
B. be representative of the whole cultivation area.
C. be dispatched as soon as possible.
D. be placed in clean bags.

1.1.3 A plant with different varieties is called:

A. a specie.
B. a cultivar.
C. a genus.
D. a clone.

1.1.4 Meiosis is the process of division in the:

A. stigma.
B. style.
C. anther.
D. ovule.

1.1.5 Crop farming under dry land conditions occurs in the:

A. arid regions.
B. humid regions.
C. sub-humid regions.
D. semi-arid regions.
1.1.6 The evaporation pan is used in:
A. crop rotation.
B. scheduled irrigation.
C. animal nutrition.
D. soil science.

1.1.7 Monoculture means:
A. the cultivation of a different crop every year.
B. the cultivation of a single crop on the same soil over years.
C. the cultivation of a single crop.
D. the cultivation of various crops in one season.

1.1.8 Which one of the following factors does not contribute to soil erosion in South Africa?
A. temperature
B. incorrect cultivation
C. slope of the land
D. veld fires

1.1.9 Farmers usually prefer to use fertilizer mixture to fertilise their crops, because:
A. it does not have an acidifying effect on soil.
B. fertiliser mixtures are cheaper.
C. plant nutrients can conveniently be applied simultaneously in the chosen proportion.
D. the nutrients in mixtures are more accessible.

1.1.10 A requirement when registering pesticides is their:
A. toxicity.
B. concentration.
C. degradability.
D. harmfulness.  \((10 \times 2 = 20)\)
1.2 Choose a description from Column B that matches a concept / phrase in Column A. Write only the letter (A. – G.) next to the question number (1.2.1 – 1.2.5) on the attached ANSWER SHEET, for example 1.2.6 J.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>source of irrigation water</td>
<td>lime</td>
</tr>
<tr>
<td>high heat capacity</td>
<td>farm manure</td>
</tr>
<tr>
<td>improves the keeping quality of crops</td>
<td>soil water</td>
</tr>
<tr>
<td>counteracts excess soil acidity</td>
<td>boreholes</td>
</tr>
<tr>
<td>uneconomical organic fertiliser</td>
<td>nitrogen</td>
</tr>
<tr>
<td>for extensive grain farming</td>
<td>phosphorus</td>
</tr>
<tr>
<td></td>
<td>green manure</td>
</tr>
</tbody>
</table>

(5 x 2 = 10)

1.3 Give ONE agricultural term / phrase for each of the following descriptions. Write only the term / phrase next to the question number (1.3.1 – 1.3.5) on the attached ANSWER SHEET.

1.3.1 The carbohydrate that gives sturdiness to plant cells.
1.3.2 The hormone used to treat flowers to produce seedless fruit.
1.3.3 Cropping fields that only receive water when it rains.
1.3.4 The soil moisture content when there is not enough available water for plants to absorb and provide in their transpiration needs.
1.3.5 The apparatus used by irrigation farmers to measure the moisture tension of soil.

(5 x 2 = 10)

1.4 Change the UNDERLINED WORD(S) in the following sentences to make the statements TRUE. Write the appropriate word(s) next to the question number (1.4.1 – 1.4.5) on the attached ANSWER SHEET.

1.4.1 Meiotic cell division takes place just after fertilisation.
1.4.2 Physically modified crops are resistant to pests and diseases and thus reduce the need for chemical sprays.
1.4.3 International biotechnology is when the farmer brings together different control methods to optimise pest control.
1.4.4 Flood irrigation can easily be used, as the water is delivered exactly where it is needed.

1.4.5 The **gynaecium** represents the male sex organs.  

\[ 5 \times 1 = 5 \]  

TOTAL SECTION A: 45
SECTION B (105 MARKS)

ANSWER ALL THE QUESTIONS

QUESTION 2

2.1 The following diagram illustrates an important metabolic reaction in plants:

Source: *Study and Master Agricultural Sciences*, Gr. 11 & 12, C.E. Lang, M.M. Mavovana

2.1.1 Define the process illustrated above. (3)

2.1.2 Identify the plant plastid where this process takes place. (1)

2.1.3 Name the requirements for the process numbered 1 to 4. (4)

2.1.4 The products of the process are numbered 5 and 6. Identify the products. (2)

2.2 Explain the process of osmosis. (3)

2.3 Name the nutrient deficiency for each of the following symptoms:

2.3.1 Growth points of plants develop slowly or not at all. (1)

2.3.2 Chlorosis of younger leaves occurs. (1)

2.3.3 Small oranges are formed with cracked skins. (1)

2.3.4 Small leave disease. (1)

2.3.5 Inverted green V-pattern (1)
2.4 Discuss the benefits of the following processes for plant growth:

2.4.1 restricted water loss through plant leaves (2)
2.4.2 wetting of clay particles (2)

2.5 Study the reaction given below and answer the questions that follow:

\[ \text{Al}^{3+} + \text{H}_2\text{PO}_4^- + \text{H}_2\text{O} \rightleftharpoons 2\text{H}^+ + \text{Al(OH)}_2^- \text{H}_2\text{PO}_4 \]

A \hspace{1cm} B

2.5.1 Under which condition will the reaction proceed to the right? (2)
2.5.2 What is the reaction called when it proceeds to the right? (2)
2.5.3 In which form is the phosphate more soluble? A or B? (2)

2.6 LAN is an inorganic fertiliser.

2.6.1 Two types of LAN are available on the market, namely LAN (26) and LAN (28).

What does the number in brackets indicate? (1)

2.6.2 Name another nitrogen containing fertiliser that can be used. (1)

2.6.3 The price of LAN (28) is R400 per ton and the fertiliser mentioned in QUESTION 2.6.2 is R550 per ton. Which one of the nitrogen containing fertilisers is the cheapest per unit? Show your calculations. (5) [35]
QUESTION 3

3.1 The diagram below represents a flower of a plant. Answer the questions that follow:

![Flower Diagram]

Source: DBE Agricultural Sciences Paper 1, Gr. 12 SG, 2013

3.1.1 Identify the number of the part on the diagram where pollen grains are produced. (1)

3.1.2 Give the number of the structure that is important for the attraction of insects for pollen. (1)

3.1.3 Does the structure above represent a monocotyledonous or a dicotyledonous flower? Motivate your answer. (2)

3.1.4 Name parts 1, 4, 8 and 12. (4)

3.1.5 Two male nuclei are produced in the germinating pollen grain:

A. Name the two male nuclei. (2)

B. Give ONE function of EACH of these nuclei. (4)
3.2 Certain small scale farmers investigated the possibility of starting their own nurseries. They wanted to know more about the various asexual reproductive methods that can be applied to propagate different crops. The diagram below shows reproduction methods labelled from A to E.

Source: DBE past exam paper

3.2.1 Identify a structure in the diagram above that represents a rhizome (write down the letter only). Give **TWO** examples of crops that use this method of reproduction. (3)

3.2.2 Identify reproductive organ A and give a brief definition of this method of reproduction. (3)

3.2.3 The reproductive organs represented by C and D look the same with regard to shape.

A. Name these two organs. (2)

B. Briefly explain the difference between them. (2)

3.3. Differentiate between 'self pollination' and 'cross-pollination'. (4)

3.4. The following table represents data of some types of GM crops in South Africa.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Hectares planted</th>
<th>% of crop</th>
<th>GM trait</th>
</tr>
</thead>
<tbody>
<tr>
<td>White maize</td>
<td>1 040 million</td>
<td>62%</td>
<td>drought resistant</td>
</tr>
<tr>
<td>Yellow maize</td>
<td>567 000</td>
<td>52%</td>
<td>drought resistant</td>
</tr>
<tr>
<td>Soybean</td>
<td>144 000</td>
<td>80%</td>
<td>herbicide resistant</td>
</tr>
<tr>
<td>Cotton</td>
<td>10 000</td>
<td>90%</td>
<td>insect resistant</td>
</tr>
</tbody>
</table>

3.4.1 What does the abbreviation GM stand for? (2)

3.4.2 Calculate the total area that is covered by GM crops in South Africa. (2)
3.4.3 Which GM crop is most abundant in South Africa? (1)

3.4.4 Why do you think this crop is produced so abundantly? (2) [35]

**QUESTION 4**

4.1 Identify whether the following symptoms were caused by a fungus, bacteria or viral infection.

4.1.1 blight on beans (1)

4.1.2 scab on beans and potatoes (1)

4.1.3 ring spot on cucumbers (1)

4.1.4 brown spots on leaves (1)

4.1.5 vascular wilt (1)

4.2 4.2.1 What information, which would assist crop production, would you expect to get from a thorough soil survey? (4)

4.2.2 A soil survey indicates that your soil is mostly sandy. What can be done to improve the physical characteristics of this soil? (2)

4.2.3 Describe how the size and position of rocks in a cropping field would be a problem. (2)

4.2.4 How can rocks in soil be an advantage? (2)

4.3 Briefly explain why the following procedures are necessary in planning a farm.

4.3.1 Aerial photographs of the region are taken. (2)

4.3.2 The survey area is visited. (2)

4.3.3 Profile test holes are studied. (2)

4.4 Answer the following questions on soil drainage:

4.4.1 Give the name of water-logged soils with a high salt content. (1)

4.4.2 Name the plants which grow in water-logged soils (2)

4.4.3 Identify the soil conditions that play a role in planning a drainage system. (2)
4.4.4 Identify the type of terrain on which each one of the following systems should be used:

A. natural system (2)
B. herringbone system (2)
C. grid system (2)

4.5 How does the nutrient status of soil differ under bare and mulch cultivation? Give an explanation for your answer. (3) [35]

TOTAL SECTION B: 105

GRAND TOTAL: 150 MARKS
GRADE 11
FINAL EXAMINATION

AGRICULTURAL SCIENCES PAPER 2
(PC-07)

ANSWER SHEET

Detach from your question paper and place inside your Answer Book.

NAME: ___________________________________________________________________

STUDENT NUMBER: ___________________________________________________________________

QUESTION 1.1

<table>
<thead>
<tr>
<th>1.1.1</th>
<th>A.</th>
<th>B.</th>
<th>C.</th>
<th>D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.2</td>
<td>A.</td>
<td>B.</td>
<td>C.</td>
<td>D.</td>
</tr>
<tr>
<td>1.1.3</td>
<td>A.</td>
<td>B.</td>
<td>C.</td>
<td>D.</td>
</tr>
<tr>
<td>1.1.4</td>
<td>A.</td>
<td>B.</td>
<td>C.</td>
<td>D.</td>
</tr>
<tr>
<td>1.1.5</td>
<td>A.</td>
<td>B.</td>
<td>C.</td>
<td>D.</td>
</tr>
<tr>
<td>1.1.6</td>
<td>A.</td>
<td>B.</td>
<td>C.</td>
<td>D.</td>
</tr>
<tr>
<td>1.1.7</td>
<td>A.</td>
<td>B.</td>
<td>C.</td>
<td>D.</td>
</tr>
<tr>
<td>1.1.8</td>
<td>A.</td>
<td>B.</td>
<td>C.</td>
<td>D.</td>
</tr>
<tr>
<td>1.1.9</td>
<td>A.</td>
<td>B.</td>
<td>C.</td>
<td>D.</td>
</tr>
<tr>
<td>1.1.10</td>
<td>A.</td>
<td>B.</td>
<td>C.</td>
<td>D.</td>
</tr>
</tbody>
</table>

(10 × 2 = 20)

QUESTION 1.2

1.2.1 ______________________________________

1.2.2 ______________________________________

1.2.3 ______________________________________

1.2.4 ______________________________________

1.2.5 ______________________________________ (5 × 2 = 10)
QUESTION 1.3
1.3.1 __________________________________________________
1.3.2 __________________________________________________
1.3.3 __________________________________________________
1.3.4 __________________________________________________
1.3.5 __________________________________________________ (5 × 2 = 10)

QUESTION 1.4
1.4.1 __________________________________________________
1.4.2 __________________________________________________
1.4.3 __________________________________________________
1.4.4 __________________________________________________
1.4.5 __________________________________________________ (5 × 1 = 5) [45]

TOTAL SECTION A: 45