education

Department of Education
FREE STATE PROVINCE

Marks obtained	
	50

GRADE 12

LIFE SCIENCES

ASSIGNMENT

PLANT HORMONES

JULY 2023

TIME: 50 minutes

MARKS: 50

NOTE: ALL ACTIVITIES MUST BE DONE BY EACH LEARNER IN A CONTROLLED ENVIRONMENT AND UNDER SUPERVISION OF THE EDUCATOR

This paper consists of 8 pages.

NAME: _____

QUESTION 1

The effects of different plant hormones are illustrated in the diagrams.

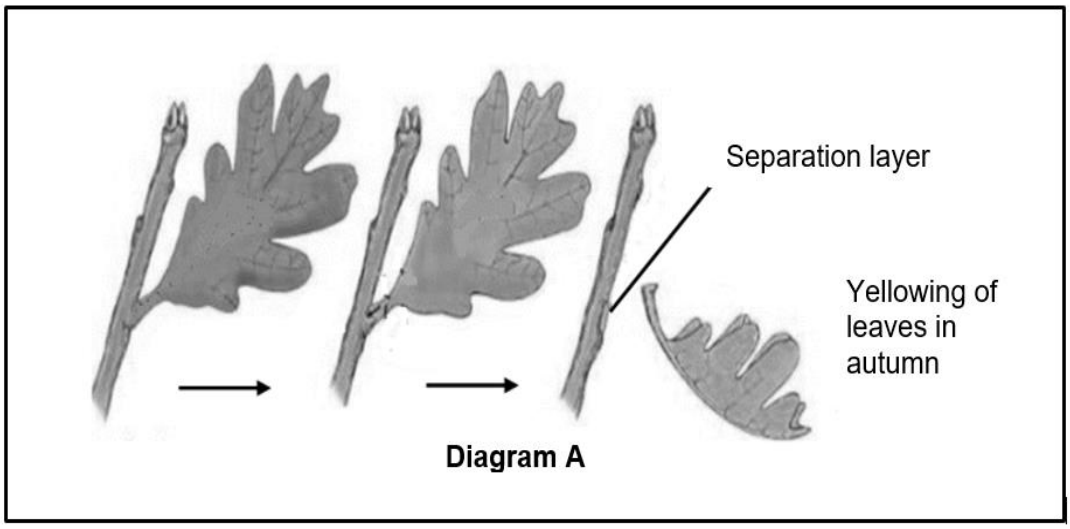
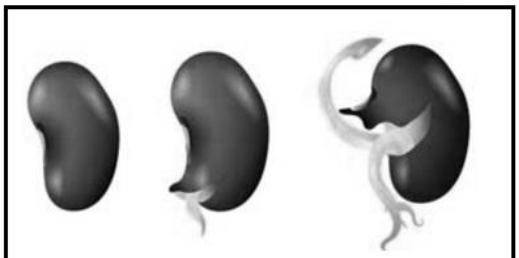


Diagram A



Germinating seeds

Diagram B

1.1 Identify the plant hormone responsible for the specific result in:

1.1.1 Diagram **A** _____ (1)

1.1.2 Diagram **B** _____ (1)

1.2 Give TWO characteristics of plant hormones. (2)

_____

_____

(4)

QUESTION 2

2.1

2.1.1 Explain how the pruning (cutting off the growing tip) affects the development of lateral buds. (3)

_____

_____

_____

_____

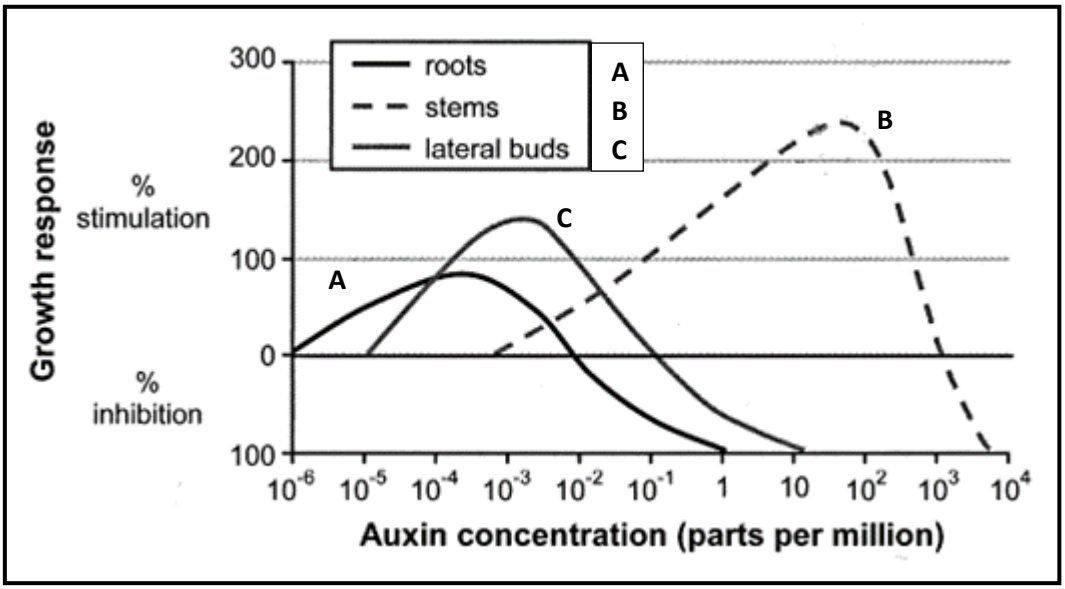
2.1.2 How can farmers benefit from pruning apple trees? (2)

_____

_____

(5)

2.2 Study the graphic representation below showing the effect of auxin on the growth of roots, stems and lateral buds



2.2.1 Which organ is least stimulated by an increased auxin concentration? (1)

_____

2.2.2 At which auxin concentration did the growth of lateral buds begin to decrease? (1)

2.2.3 What conclusion can be made about auxin concentration and growth response in stems up to 10 parts per million? (2)

_____

_____

(4)

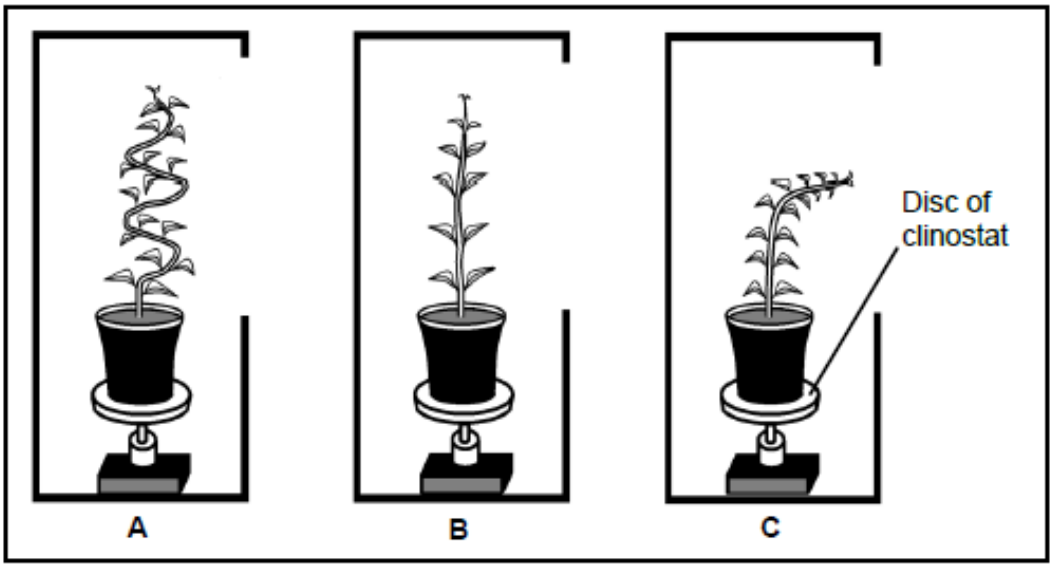
QUESTION 3

A clinostat is a device used to investigate plant growth responses. It has a disc that rotates very slowly when the clinostat is switched on.

During an investigation on plant responses to light, the procedure below was followed:

- Three pot plants of the same species were used.
- Each pot plant was placed on one of three identical clinostats.
- Each set of apparatus, **A**, **B** and **C**, was placed in a box of the same size with a single opening.
- Each clinostat was treated in a different way over a period of five weeks.

The results of the investigation are represented in the diagrams below.



3.1 Name the plant growth response to light. (1)

_____

3.2 State TWO factors that were kept constant during the investigation. (2)

_____

_____

3.3 Give ONE reason why the results of this investigation may be considered to be unreliable. (1)

_____

3.4 In which apparatus (**A, B** or **C**) was the clinostat:

3.4.1 Switched on and rotating slowly _____ (1)

3.4.2 Switched off, but manually rotated through 180^{o} once a week (1)

_____

3.5 Explain the effect of the unilateral light on the distribution of auxins in the plant in apparatus **C**. (2)

_____

_____

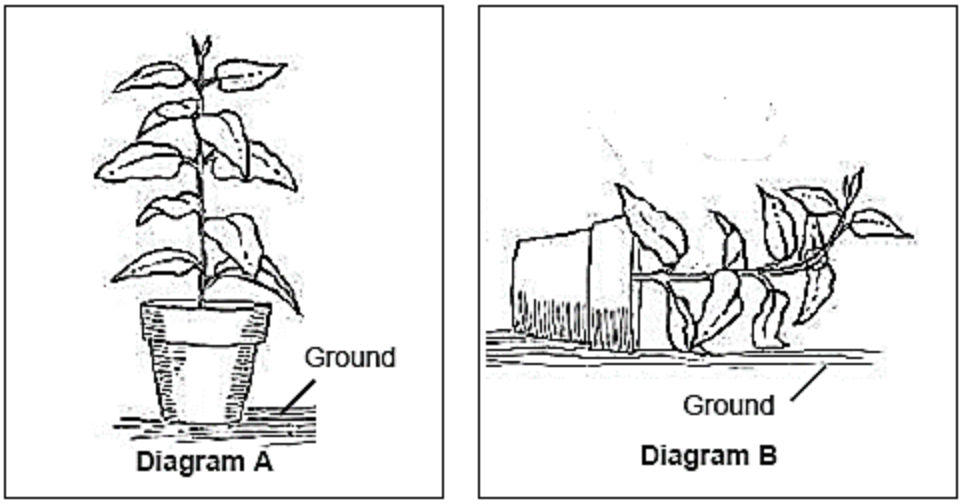
_____

_____

(8)

QUESTION 4

Diagram **A** shows an upright pot plant. Diagram **B** shows the same pot plant one week after falling over. The plant was exposed to uniform light from all directions before and after falling over.



4.1 Explain the growth pattern in the plant, as illustrated in diagram **B**. (5)

_____

_____

_____

_____

_____

4.2 Explain the advantage that the upward bending of the stem could have for the plant. (2)

_____

_____

4.3 State how the roots in diagram **B** would react. (1)

_____

_____

(8)

QUESTION 5

5.1 Name TWO types of defence mechanisms found in plants. (2)

_____

_____

5.2 Name THREE different structures found on the outer surface of some plants, preventing animals feeding from them. (3)

_____

_____

_____

(5)

QUESTION 6

Read the extract below and answer the questions that follow.

> Weeds are problematic to farmers because they invade farm fields and outcompete crop plants for space and nutrients. Farmers spray their fields with chemicals, known as herbicides, to kill the weeds. Some weeds, however, have evolved to be resistant to herbicides. Scientists investigated the time it took for a species of weed to develop resistance to five types of herbicides.

The results are shown in the table below.

Type of herbicide	Time taken for weeds to develop resistance (years)
2,4 – D	9
Dalapon	9
Picloran	25
Dicloflop	7
Trifluralin	26

6.1 Refer to the passage above and state how weeds reduce crop yield. (2)

_____

_____

6.2 Identify the dependent variable. (1)

_____

6.3 Identify the independent variable. (1)

_____

6.4 Name the herbicide:

6.4.1 To which the weeds developed resistance the fastest. (1)

_____

6.4.2 That remained effective for the longest period of time. (1)

_____

6.5 The scientist used the same weed species when investigating resistance to the different herbicides.

6.5.1 Describe how the scientists would have determined the resistance of the weeds to the herbicides. (2)

_____

_____

_____

6.5.2 Explain how the use of the same weed species improved the validity of this investigation. (2)

_____

_____

_____

6.6 Draw a bar graph to show the time taken for the evolution of resistance to the herbicides. (6)

(16)

TOTAL: 50