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**GRADE 12**

**LIFE SCIENCES**

**ASSIGNMENT**

**PLANT HORMONES**

**MARKING GUIDELINES**

**July 2023**

**TIME: 50 minutes**

**MARKS: 50**

**This marking guideline consists of 4 pages**

|  |
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| **QUESTION 1** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1.1 |  |  |  |  |  |
|  | 1.1.1  1.1.2 | Abscisic acid🗸/Auxins  Gibberellins🗸 | |  | (1)  (1) |
|  |  |  |  |  |  |
| 1.2 | - Plant hormones are organic🗸 compounds  - needed in small quantities🗸  - and act as chemical messengers🗸 any  **(Mark first TWO only)** | | |  | (2) |
|  |  |  |  |  | **(4)** |

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| **QUESTION 2** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2.1 | 2.1.1 | Once the tip of the stem is removed:  - the auxin concentration will decrease√  - lateral buds closer to the top will develop√  - because the low auxin level will **not inhibit** the development of lateral  buds√ |  | (3) |
|  |  |  |  |  |
|  | 2.1.2 | - More lateral branches will develop√, making the trees more bushy  - Increased fruit formation🗸/bear more fruit/increase fruit yield  - Higher income√/profit any |  | (2) |
|  |  |  |  | **(5)** |
|  |  |  |  |  |
| 2.2 | 2.2.1 | Roots√ |  | (1) |
|  |  |  |  |  |
|  | 2.2.2 | 10 -3 √ (also accept 10 -2) |  | (1) |
|  |  |  |  |  |
|  | 2.2.3 | Higher auxin concentration stimulates a higher growth response in stems√√ |  | (2) |
|  |  |  |  | **(4)** |
|  |  |  |  | **[9]** |

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| **QUESTION 3** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 3.1 | Phototropism√ | | |  | (1) |
|  |  |  | |  |  |
| 3.2 | - The same species√ of plant was used in each set-up  - Identical clinostats√ were used in each set-up  - Each apparatus was placed in a box of the same size  - with a single opening√ in the same position  - The opening on each box was in the same position√/was the same  size/allowed the same amount of light to enter  **(Mark first TWO only)** any | | |  | (2) |
|  |  |  | |  |  |
| 3.3 | - The investigation was only done once√/ not repeated more than once  - Only one plant was used in each set-up√/ the sample size was too small  **(Mark first ONE only)**  any | | |  | (1) |
|  |  |  | |  |  |
| 3.4 | 3.4.1 | B√ | |  | (1) |
|  | 3.4.2 | A√ |  |  | (1) |
|  |  |  | |  |  |
| 3.5 | - The auxins moved away from the light√ / were destroyed by the light  - so that the darker side/opposite side had a high concentration of auxins√  - and the lighted side had a low concentration√ any | | |  | (2) |
|  |  | | |  | **(8)** |

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| **QUESTION 4** |

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| 4.1 | - Auxin√  - accumulate in the bottom√ part of the stem  - because of gravitation√  - the higher concentration of auxin on the lower side of the stem stimulates cell  elongation√ / growth at the bottom of the stem  - The lower auxin concentration on the upper side of the stem inhibits cell  elongation√/ growth on the upper side of the stem  - This is known as geotropism√ any |  | (5) |
|  |  |  |  |
| 4.2 | - The leaves and the stem will grow in such a way that they will receive  maximum light√  - for photosynthesis√  **OR**  - Flowers are positively exposed√  - for pollination√/ seed dispersal |  | (2) |
|  |  |  |  |
| 4.3 | The roots will grow downwards√ |  | (1) |
|  |  |  | **(8)** |

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| **QUESTION 5** |

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| --- | --- | --- | --- | --- |
| 5.1 | - Chemical√ and  - mechanical√/ physical | |  | (2) |
|  |  | |  |  |
| 5.2 | - spine √  - thorns√  - bark√  - waxy cuticle √ any  **(Mark first THREE only)** | |  | (3) |
|  |  | |  | **(5)** |
| **QUESTION 6** | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 6.1 | - They outcompete crop plants for space✓ and  - nutrients✓ | |  | (2) |
|  |  | |  |  |
| 6.2 | Time taken for weed to develop resistance✓ | |  | (1) |
|  |  | |  |  |
| 6.3 | Type of herbicide✓ | |  | (1) |
|  |  | |  |  |
| 6.4 | 6.4.1 | Dicloflop ✓ |  | (1) |
|  | 6.4.2 | Trifluralin ✓ |  | (1) |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 6.5 | 6.5.1 | They would count the number of weeds that survived over a period of time√√ |  | (2) |
|  |  |  |  |  |
|  | 6.5.2 | The same weed species will react/respond in the same way to the different herbicides√√ / no other variable could have affected the weed species’ survival |  | (2) |
|  |  |  |  |  |
| 6.6 |  |  |  | (6) |



Type of Herbicide

Trifluralin

Picloran Dicloflop

Dalapon

2,4 - D

30

25

20

15

10

5

0

Time taken for weeds to develop resistance to various herbicides

Guidelines for marking graph

|  |  |
| --- | --- |
| **Criteria** | **Mark** |
| Type of graph | 1 |
| Caption | 1 |
| Scale: Correct scale for X-axes (equal width of bars) and Y-axes | 1 |
| Labels: Correct label for X-axes and correct label and unit of Y-axes) |  |
| Plotting | 1: 1 – 4 bars correctly drawn  2: All bars correctly drawn |

**NOTE:**

* If the wrong type of graph is drawn, 1 mark will be lost for: “Correct type of graph”.
* If labels of the axes are transposed then 2 marks will be lost for: “ Correct label AND scale for x-and y-axes.

|  |  |  |  |  |
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|  |  |  |  | **(16)** |
|  |  | **TOTAL:** |  | **50** |