



Education and Sport Development

Department of Education and Sport Development
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NORTH WEST PROVINCE

PROVINCIAL ASSESSMENT

GRADE 11

AGRICULTURAL SCIENCES P2

NOVEMBER 2019

MEMORANDUM

MARKS: 150

This marking guideline consists of 9 pages

SECTION A**QUESTION 1****1.1 MULTIPLE CHOICE:**

1.1.1 B ✓✓

1.1.2 D ✓✓

1.1.3 B ✓✓

1.1.4 A ✓✓

1.1.5 C ✓✓

1.1.6 D ✓✓

1.1.7 B ✓✓

1.1.8 A ✓✓

1.1.9 C ✓✓

1.1.10 D ✓✓

(10 x 2) (20)

1.2 MATCHING COLUMNS:

1.2.1 A Only ✓✓

1.2.2 B Only ✓✓

1.2.3 A Only ✓✓

1.2.4 BOTH A and B ✓✓

1.2.5 NONE ✓✓

(5 x 2) (10)

1.3 AGRICULTURAL WORDS/TERMS/PHRASES:

1.3.1 Autotroph ✓✓

1.3.2 Parthenocarpy ✓✓

1.3.3 Scion ✓✓

1.3.4 Evaporation pan ✓✓

1.3.5 Flood/Furrow/Basin irrigation ✓✓

(5 x 2) (10)

1.4 CHANGING OF UNDERLINED WORDS:

1.4.1 Metabolism ✓

1.4.2 Nucleus ✓

1.4.3 Diffusion gradient ✓

1.4.4 Cohesion ✓

1.4.5 Fungi ✓

(5 x 1) (5)

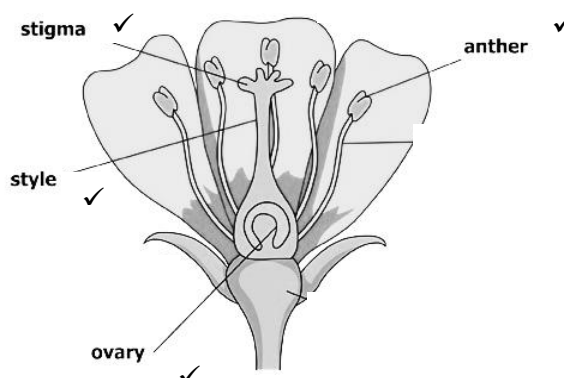
TOTAL SECTION A: 45**QUESTION 2: PLANT NUTRITION**

- 2.1 2.1.1 **Suggest FOUR methods of manipulating plants to increase the photosynthetic rate**
- Trellising ✓
 - Pruning ✓
 - Greenhouses ✓
 - Spacing ✓
- (4)
- 2.1.2 **Describe the relationship indicated in the graph**
As the concentration of CO₂ increases, ✓ the tempo/rate of photosynthesis ✓ also increases. ✓
- (3)
- 2.1.3 **FOUR factors that increase the rate of photosynthesis**
- Light intensity ✓
 - Availability of carbon dioxide ✓
 - Availability of water ✓
 - Temperature of air ✓
- (4)
- 2.1.4 **Importance of photosynthesis to living organisms**
- It produces atmospheric oxygen which is important for the cellular respiration of all living organisms. ✓
 - It produces chemical energy which is stored in food and used by all living organisms for metabolic processes. ✓
 - The oxygen that accumulates in the atmosphere, forms a layer of ozone that protects living organisms. ✓ (Any 3 x 1)
- (3)
- 2.2 2.2.1 **THREE physical effects of organic matter on a garden bed**
- Improves soil structure and texture / binds soil particles together to form aggregates ✓
 - It improves the water holding capacity of the soil ✓
 - It reduces soil compaction ✓
 - It improves penetrability of the soil for ground moisture, mineral nutrients and gases ✓
 - It improves soil aeration ✓

- Prevents water run-off and erosion ✓
 - Soil will have dark brown colour which absorb heat ✓
 - Reduces stickiness of clay and therefore improves till ability ✓ (Any 3 x 1) (3)
- 2.2.2 **THREE factors that influence the composition of farm manure**
- Storage and handling of the manure ✓
 - The type of animal ✓
 - The age of the animal and the type of feed ✓
 - Nature and quantity of bedding ✓ (Any 3 x 1) (3)
- 2.3 2.3.1 **Indication represented by the figure (30)**
 The figure 30 indicates the percentage mass of the fertiliser that actually contains the elements. ✓
 OR
 30 indicates the total amount of nutrients in 100 kg of the mixture ✓
 OR
 30 indicates that the fertiliser mixture contains 30% of N.P.K ✓ (1)
- 2.3.2 **Provide names for the following symbols:**
- N is Nitrogen ✓
 - P is Phosphorus ✓
 - K is Potassium ✓ (3)
- 2.3.3 **Give ONE word to describe the following: 2:3:2 Ratio** ✓ (1)
- 2.4 2.4.1 **Identify the minerals which will cause the above deficiencies at:**
A = Sulphur ✓
B = Potassium ✓
C = Iron, Magnesium, Manganese, Zinc ✓ (Any 1)
D = Nitrogen ✓ (4)
- 2.4.2 **Function of molybdenum**
- Required for nitrogen fixation. ✓
 - Activates the enzyme nitrate reductase. ✓ (Any 1) (1)
- 2.4.3 **TWO ways in which mineral nutrient uptake occurs in plants**
- Passive ion uptake by diffusion. ✓
 - Active ion uptake by transport carrier molecules ✓ (2)
- 2.5 **Matching of molecule movement processes**
- 2.5.1 diffusion ✓ (1)
- 2.5.2 osmosis ✓ (1)
- 2.5.3 osmosis ✓ (1)

QUESTION 3: PLANT REPRODUCTION

3.1

**FLOWER**✓

Correct sketch = ✓

(6)

3.2 3.2.1

Identify the type of pollination above:

- **A** = self pollination✓
- **B** = cross pollination✓

(2)

3.2.2

Which type of pollination tends to increase genetic variability in plants?

Cross pollination✓

(1)

3.3 3.3.1

TWO reasons to support the suitability of contact herbicide to control weeds

- They only affect the part of the plant they are applied✓
- They are suitable for annual plants✓
- They do not affect root crops✓
- Leaves can resurrect after a period of time without total destruction✓

(Any 2 x 1)

(2)

3.3.2

TWO reasons why weeds easily overgrow cultivated crops

- Weeds grow easily in disturbed environments✓
- Weeds produce large quantities of seeds✓
- Weeds seeds have a long life span✓
- Weeds have many seed dispersal methods✓
- Most weeds are native/adaptable to the environment within which they compete with cultivated crops✓

(Any 2 x 1)

(2)

3.3.3

Negative effects of weeds on the growth of food crops

- Weeds compete with crops for moisture/space/nutrients✓
- Weeds interfere with the harvesting of crops✓
- Weeds serve as host plants for insects and pests✓
- Weeds that are thorny pose health hazards to plants✓

(Any 2 x 1)

(2)

- 3.4 **THREE safety measures to consider when applying chemicals on crops**
- Use the right product for the pest to be controlled✓
 - Use the right quantity of pesticide✓
 - Apply the product at the correct stage✓
 - Ensure the correct interval for the application of the product✓
 - Follow the safety directions such as wearing the right clothes✓
 - Do not dispose chemicals into a water source✓ (Any 3 x 1) (3)
- 3.5 **Key legislative initiatives by NDA for plant protection**
- Fertilizers, farm seeds, Agricultural Remedies and Stock Remedies Act. 1947✓
 - Agricultural Pest Act. 1983✓
 - Agricultural Product Standard Act. 1990✓
 - Conservation of Agricultural Resources Act. 1983✓
 - The Plant Breeders Right Act. 1976✓
 - Genetically Modified Organisms Act. 1997✓ (Any 2 x 1) (2)
- 3.6 3.6.1 **What are some of the arguments against genetically modified foods? Name TWO.**
- Unknown effects on non-target organisms✓
 - Production of 'superweeds' that are difficult to control✓
 - Terminator gene technology✓
 - Development of pest resistance to genetically engineered crop plants. ✓ (Any 2 x 1) (2)
- 3.6.2 **Give THREE advantages of genetic modification.**
- Increased crop productivity✓
 - Increased drought tolerance✓
 - Increased crop protection✓
 - Improved nutritional value of food✓
 - Improved keeping quality✓
 - Environmental benefits✓ (Any 3 x 1) (3)
- 3.7 3.7.1 **Differentiate between *cutting* and *grafting*.**
cutting – cuttings are taken from stems, leaves or roots of the parent plant and then these grow into new plants. ✓✓
grafting – in grafting a whole scion with several buds is used to propagate a plant with desired properties. ✓✓ (4)
- 3.7.2 **Give TWO advantages of asexual reproduction.**
- Faster
 - Large number of offspring✓
 - New plants propagated from existing ones✓
 - No fertilisation necessary✓
 - Progeny genetically identical to parent✓
 - Germination of seed is unnecessary✓
 - New plants adapt easily to environments where parents grow✓ (Any 2 x 1) (2)

3.7.3 Name TWO methods of asexual reproduction.

- cutting✓
- budding✓
- grafting✓

(Any 2 x 1) (2)

3.8 Give ONE plant disease of fungal origin and ONE plant disease of bacterial origin.**Fungal**

- early and late blight✓
- leaf curl✓
- cankers✓
- rusts✓
- moulds✓
- wilts✓

(any 1)

Bacterial

- Bacterial leaf blight✓
- Bacterial leaf spot✓
- Bacterial soft rot✓
- Bacterial wilt✓
- Bacterial canker ✓

(Any 1) (2)

[35]**QUESTION 4: OPTIMAL RESOURCE UTILISATION****4.1 Study the following soil surveying equipment and answer the questions that follow:****4.1.1 Explanation of soil survey**

It is the process of classifying soil types and their distinctive properties/differentiating soil types from one another in a given area,✓ and geo-encoding such information / interpreting and implementing the information. ✓

(2)

4.1.2 TWO aims of soil survey

- For the sustainability of a particular crop✓
- Suitability for irrigation✓
- Suitability for animal grazing purposes✓
- To prevent erosion risk✓
- Identification for major agricultural land use e.g. gravel and marshy land✓

(Any 2 x 1) (2)

4.1.3 THREE steps to follow in the physical analysis of soil

- Digging soil pits✓
- Determining soil profile✓
- Determining physical and chemical properties✓

(3)

- 4.2 4.2.1 **Structure**
- Closed or Recirculation system✓ (1)
- 4.2.2 **FOUR requirements that need to be considered for production**
- Water quality✓
 - Temperature✓
 - Dissolved oxygen✓
 - Feed management✓
 - pH✓
 - Maintenance✓
 - Nitrogenous compounds✓
 - Disease control✓ (Any 4 x 1) (4)
- 4.2.3 **TWO methods that can be used for disease control**
- Vaccines✓
 - Good bio-security✓
 - Reduce stress✓ (Any 2 x 1) (2)
- 4.3 **Differentiate between *flood irrigation* and *sprinkler irrigation***
- Flood irrigation:*
The whole surface of the soil is flooded✓✓
- Sprinkler irrigation:*
Water is forced under pressure through a rotating spray to reach the soil's surface in the form of separate drops. ✓✓ (4)
- 4.4 **Case study on modern technology**
- 4.4.1 **Example of how modern technology is used in Agriculture**
- Precision farming✓ (1)
- 4.4.2 **TWO reasons why modern technology may be unpopular**
- Equipment is expensive✓
 - Job losses due to less labour intensive✓
 - Skilled labours required✓ (Any 2 x 1) (2)
- 4.4.3 **TWO advantages of modern technology in farming practices**
- Increases crop production✓
 - Less pollution✓
 - Less input costs✓ (Any 2 x 1) (2)
- 4.5 4.5.1 **Structure**
- Hydroponics✓ (1)
- 4.5.2 **TWO advantages of the system**
- No soil is needed✓
 - Water costs are lower✓
 - Easy to control nutrition levels and fewer nutrients are used✓
 - Reduction in pollution , because water is recycled✓
 - No need for tilling, watering or fumigation✓
 - Easier to get rid of plant pests and diseases✓
 - Fewer fertilisers✓ (Any 2 x 1) (2)

4.5.3 **TWO basic requirements to achieve high yields**

- Growth medium✓
- Water✓
- nutrients✓

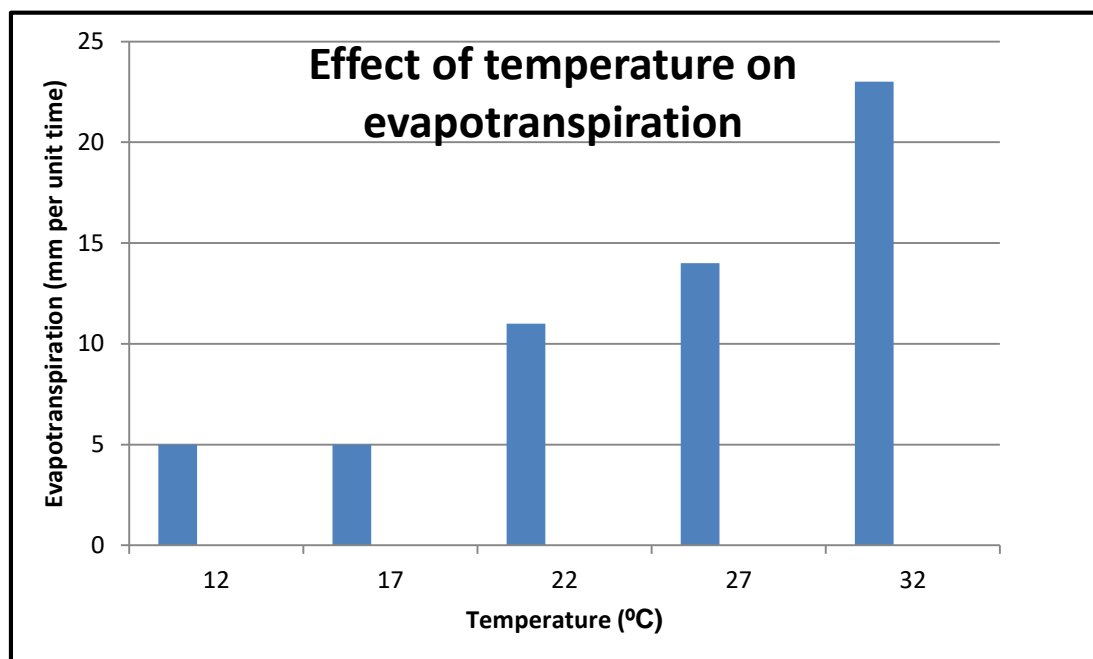
(Any 2 x 1) (2)

4.5.4 **TWO reasons why this method of farming is advantageous to the farmer**

- Less space is needed✓
- Farmer can control the environment✓
- No soil is needed✓

(Any 2 x 1) (2)

4.6



Criteria/rubric/marketing guidelines

- Line graph✓
- Correct heading✓
- Correct plotting / proportional plotting✓
- Labelling and units of Y-axis✓
- Labelling and units of X-axis✓

(5)
[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150

Analysis Grid
Agricultural Sciences PAPER 2

Question	Cognitive Levels			SA1	SA2	SA3	Knowledge Area	resource utilisation	Total
	A	B	C	knowing	investigations	understanding	plant studies		
1.1.1	2			2			2		2
1.1.2	2			2			2		2
1.1.3	2			2			2		2
1.1.4	2			2			2		2
1.1.5	2			2			2		2
1.1.6	2			2			2		2
1.1.7	2			2			2		2
1.1.8	2			2			2		2
1.1.9	2			2			2		2
1.1.10	2			2			2		2
1.2.1	2			2			2		2
1.2.2	2			2			2		2
1.2.3	2			2			2		2
1.2.4	2			2			2		2
1.2.5	2			2			2		2
1.3.1	2			2			2		2
1.3.2	2			2			2		2
1.3.3	2			2			2		2
1.3.4	2			2			2		2
1.3.5	2			2			2		2
1.4.1	1			1			1		1
1.4.2	1			1			1		1
1.4.3	1			1			1		1

1.4.4	1			1			1		1
1.4.5	1			1			1		1
Total Section A:	45	0	0	45	0	0	45	0	45
2.1.1			4	4			4		4
2.1.2	3			3			3		3
2.1.3	4			4			4		4
2.1.4		3				3	3		3
2.2.1			3		3		3		3
2.2.2		3		3			3		3
2.3.1	1			1			1		1
2.3.2			3		3		3		3
2.3.3		1		1			1		1
2.4.1		4			4		4		4
2.4.2	1			1			1		1
2.4.3		2		2			2		2
2.5.1	1			1			1		1
2.5.2	1			1			1		1
2.5.3	1			1			1		1
3.1			6		6		6		6
3.2.1		2			2		2		2
3.2.2		1		1			1		1
3.3.1			2	2			2		2
3.3.2			2	2			2		2
3.3.3		2		2			2		2
3.4.		3		3			3		3
3.5		2			2		2		2
3.6.1		2		2			2		2
3.6.2			3		3		3		3
3.7.1		4		4			4		4

3.7.2		2			2		2		2
3.7.3		2		2			2		2
3.8	2			2			2		2
4.1.1		2			2			2	2
4.1.2			2			2		2	2
4.1.3		3			3			3	3
4.2.1		1			1			1	1
4.2.2			4	4				4	4
4.2.3		2		2				2	2
4.3.		4		4				4	4
4.4.1	1					1		1	1
4.4.2			2			2		2	2
4.4.3		2		2				2	2
4.5.1		1				1		1	1
4.5.2		2		2				2	2
4.5.3	2			2				2	2
4.5.4		2		2				2	2
4.6			5		5			5	5
Total Section B:	17	52	36	59	36	10	70	35	105
Grand Totals:									
Actual Marks	62	52	36	104	36	10	115	35	150
Actual Percentage	41,3%	35.6%	24%	69.3%	24%	6.7%			100.0
Recommended Weighting:									
Percentage	40%	40%	20%	75%	20%	5%			
Marks	60	60	30	112	30	8			