



# **education**

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Noord-Wes Departement van Onderwys  
North West Department of Education  
NORTH WEST PROVINCE**

**PROVINCIAL ASSESSMENT**

**GRADE 11**

**AGRICULTURAL SCIENCES P1**

**NOVEMBER 2019**

**MARKING GUIDELINES**

**MARKS: 150**

**These marking guidelines consist of 7 pages and  
3 pages containing the cognitive grid**

**SECTION A****QUESTION 1****1.1. Multiple choice questions**

1.1.1. C✓✓

1.1.2. B✓✓

1.1.3. D✓✓

1.1.4. A✓✓

1.1.5. A✓✓

1.1.6. C✓✓

1.1.7. B✓✓

1.1.8. D✓✓

1.1.9. D✓✓

1.1.10. B✓✓

(10 x 2) (20)

**1.2. Column A and B**

1.2.1. A Only✓✓

1.2.2. B Only✓✓

1.2.3. Both A and B✓✓

1.2.4. B Only✓✓

1.2.5. Both A and B✓✓

(5 x 2) (10)

**1.3. One word/ term**

1.3.1. Neutralisation✓✓

1.3.2. Disaccharides✓✓

1.3.3. Cohesion✓✓

1.3.4. Compaction✓✓

1.3.5. Aggregates✓✓

(5 x 2) (10)

**1.4. Change the underlined words**

1.4.1. solid✓

1.4.2. halogens✓

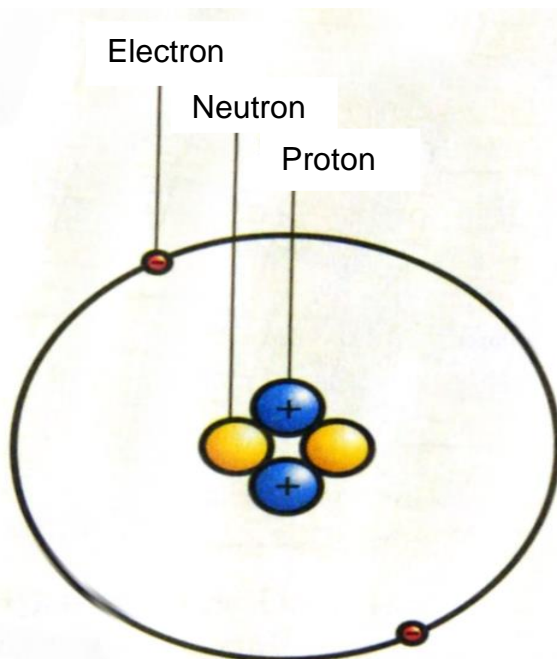
1.4.3. homogeneous✓

1.4.4. Biological✓

1.4.5. 1 to 14✓

(5 x 1) (5)

**TOTAL SECTION A [45]**

**SECTION B****QUESTION 2: BASIC AGRICULTURAL CHEMISTRY****2.1 Answers based on the knowledge of the Periodic table.****2.1.1. The structure of a Helium atom.**

Marking guidelines ✓✓✓✓

	Yes	No
Two electrons in orbit	2	0
Two protons in the nucleus	1	0
Neutrons in the nucleus	1	0

(4)

**2.1.2. The molecular mass of a water molecule.**

- $\text{H}_2\text{O}$  ✓  
 $= 1(2)$  ✓ +  $16$  ✓  
 $= 18$  ✓

(4)

**2.1.3. Chemical bond that forms Sodium Chloride.**

- Ionic bonding ✓✓

(2)

**2.1.4. Chemical formula for ammonia.**

- $\text{N}$  ✓  $\text{H}$  ✓<sub>3</sub> ✓

(3)

**2.2. An atom with the atomic number of 19.****2.2.1. Determine the element**

- Potassium ✓

(1)

**2.2.2. Determine the amount of neutrons of this element**

- Atomic mass – atomic number ✓  
 $= 39$  ✓ –  $19$  ✓  
 $= 20$  neutrons ✓

(4)

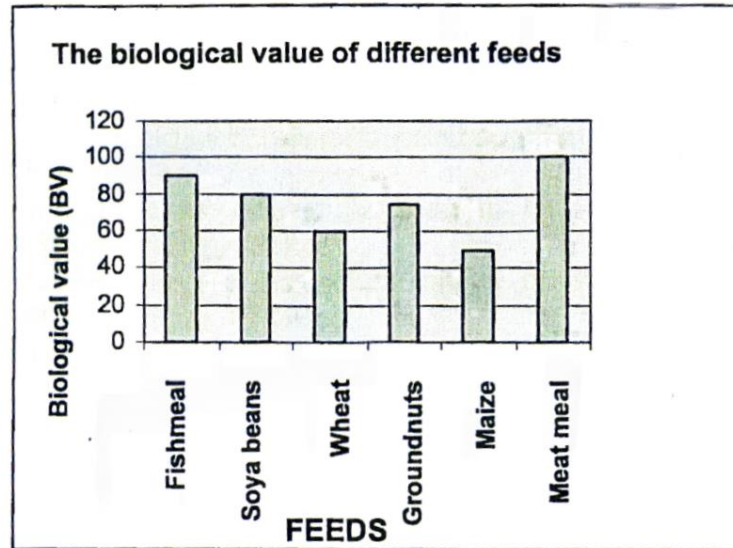
**2.3 Biological value of proteins**

**2.3.1. The highest biological value.**

- Animal based feed✓

(1)

**2.3.2. Bar graph**



**Checklist for marking:**

Criteria	Evidence No	Evidence Yes
Heading available	0	1
X-axis labelled	0	1
Y-axis labelled	0	1
Correct values (X-axis)	0	1
Correct values (Y-axis)	0	1
Bar graph	0	1

(6)

**2.3.3. Definition of essential amino-acids.**

- Essential amino-acids cannot be synthesised✓ by the human body and must be ingested/ taken in/ present in food✓.

(2)

**2.4 Esters(glycerides or fats).**

**2.4.1. The difference between fats and oils.**

- Fats are solid at room temperature✓ while oils are liquid at room temperature. ✓

(2)

**2.4.2 The physical state of plant fats.**

- Liquid/ oil✓

(2)

**2.5 Lactose, Sucrose and Maltose.**

**2.5.1 Substance that is commonly used in our homes.**

- Milk✓✓

(2)

**2.5.2 The monosaccharide is needed to form sucrose**

- Fructose✓✓

(2)

[35]

**QUESTION 3: SOIL SCIENCE****3.1 Questions based on soil-, moisture table****3.1.1 Quantity moisture withdrawn.**

- 3.1.1.1. • Quantity of moisture available x Available % withdrawal =  
Quantity moisture withdrawn✓

$$60 \times 60\% = \text{QM}✓$$

$$36 \text{ mm/m}✓$$

(3)

- 3.1.1.2 •  $170 \times 50\% = \text{QM}✓$

$$85✓ \text{ mm/m}✓$$

(3)

- 3.1.1.3 •  $240 \times 40\% = \text{QM}✓$

$$96✓ \text{ mm/m}✓$$

(3)

- 3.1.2.1 • Sand✓

(1)

- 3.1.2.2 • Loam✓

(1)

- 3.1.2.3 • Clay✓

(1)

**3.2 Bulk density.**

- 3.2.1 **Definition:** The mass of dry soil✓ per unit volume✓/ it is an indicator✓ of the compactness✓.

(2)

**3.2.2. Type of soil.**

- Soil 1✓✓

(2)

**3.2.3. Explain 3.2.2**

- Lower bulk density represents clay✓ because the solid particles in the finer textured soils✓ tend to be organised closer together✓.

(3)

**3.3 Classify soils.**

- 3.3.1. • Na✓✓

(2)

- 3.3.2 • Ca✓✓

(2)

- 3.3.3 • H✓✓

(2)

**3.4 Soil water**

- 3.4.1
- Hygroscopic✓:
  - Moisture that remains in dry soil✓/ present around soil particles
  - Prevents the soil to overheat✓
  - It forms a very thin film around the soil particle.✓ [any 2]
- 
- Capillary✓:
  - Can be used by plants✓
  - Can move from wet areas to drier areas✓
  - Upward movement of water ✓ [any 2]
- 
- Free water/ Gravitational water✓:
  - Water that moves downwards due to gravity✓
  - Replenishes subterranean water supply. ✓
  - It is found in soil macro-pores ✓ [any 2] (9)
- 3.4.2. Capillary water✓ (1)

**[35]****QUESTION 4: SOIL SCIENCES****4.1 Soil horizons****4.1.1. Order of Soil horizons**

- O✓, A✓, E✓, B✓, C✓, R✓ (6)

**4.1.2. Classification of soil horizon.**

- Topsoil: O✓, A✓
- Subsoil: B✓, E✓
- Substrata: C✓, R✓ (6)

**4.2 Soil alkalinity****4.2.1. Soil alkalinity.**

- Negative effect on water availability✓
- Negative effect on crop production✓
- Causes poor and spotty stands of crop, uneven and stunted growth and poor yield✓
- Renders less water available to plants/ wet soil is badly drained. ✓ [any 2] (2)

**4.2.2. pH of alkaline soils.**

- Except anything between 8 and 14 ✓✓ (2)

**4.3 Organic Material****4.3.1 Plant and animal residue**

- Organic material ✓✓ (2)

**4.3.2 Organic soils.**

- Dark ✓✓ (2)

**4.3.3 Requirement of soil organisms**

- Food/ nutrients ✓.
- Moisture/ water ✓
- Soil air ✓
- Temperature between 25 °C – 30 °C ✓
- pH 7,5 for bacteria/ 3,5 – 9 for protozoa ✓ [any 4] (4)

**4.3.4. Factors that influence the conversion of plant material.**

- Age of the plant ✓
- Composition of the plant material ✓
- Nitrogen content of the soil ✓
- Temperature ✓
- Aeration and moisture ✓
- Soil reaction/ type of soil micro-organism ✓
- Presence of easily digestible carbohydrates ✓ [any 4] (4)

**4.4.1. Identification of the process.**

- Nitrogen Cycle ✓✓ (2)

**4.4.2. The FOUR main processes.**

- Ammonification ✓
- Nitrification ✓
- Denitrification ✓
- Nitrogen fixation ✓ (4)

**4.4.3. The element in the cycle.**

- Nitrogen ✓ (1)

**[35]****TOTAL SECTION B: 105****GRAND TOTAL: 150**

WEIGHTING OF QUESTIONS IN TERMS OF COGNITIVE LEVELS, KNOWLEDGE AREAS, AIMS & OBJECTIVES AND SKILLS:																				
AGRICULTURAL SCIENCES: PAPER 1 GRADE 11																				
Question Number.	+Bloom`s Taxonomy			Knowledge			Aims & Objectives					Total	Skills / Types of Questions (Use a Tick)							
	Knowledge (A)	Comprehension (B) / Application (B)	Analysis (C) / Synthesis (C) / Evaluation (C)	GRADE 11			(ONLY TICK)						Number of marks allocated to question	Interpretation of Graphs	Plotting of data/Drawing of graphs	Making drawings/diagrams/schematic representations	Identifying labels/Labeling	Extraction and/or manipulation and/or evaluation of data	Organizing/Recording and re organizing data	Planning and designing experiments
				Basic Chemistry	Soil Science 1	Soil Science 2	Management and care of the environment	Problem solving mechanisms	Social and economic development	informed and responsible citizens	Agricultural indigenous knowledge									
<b>SECTION A</b>																				
<b>Question 1</b>																				
	A	B	C	BC	SC1	SC2	1	2	3	4	5	TOT	I	P	D	L	E	O	S	
1.1.1	2			2				✓				2				✓				
1.1.2	2			2					✓			2				✓				
1.1.3		2		2				✓				2					✓			
1.1.4	2			2				✓				2					✓			
1.1.5		2		2						✓		2						✓		
1.1.6		2		2						✓		2						✓		
1.1.7	2			2			✓					2						✓		
1.1.8		2		2							✓	2					✓			
1.1.9		2				2	✓	✓				2					✓			
1.1.10			2			2		✓				2					✓			
1.2.1	2			2				✓				2						✓		
1.2.2			2	2				✓				2				✓				
1.2.3		2		2				✓				2						✓		
1.2.4	2				2			✓				2					✓			
1.2.5	2					2			✓			2				✓				
	A	B	C	BC	SC1	SC2	1	2	3	4	5	TOT	I	P	D	L	E	O	S	



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1.3.1	2			2				✓				2				✓		
1.3.2	2			2			✓					2				✓		
1.3.3		2			2			✓				2					✓	
1.3.4	2					2		✓				2				✓		
1.3.5	2				2		✓					2				✓		
1.4.1	1			1						✓		1				✓		
1.4.2	1			1				✓				1				✓		
1.4.3		1			1		✓					1					✓	
1.4.4	1					1		✓				1				✓		
1.4.5	1					1	✓					1				✓		
<b>Sub-total A</b>	<b>26</b>	<b>15</b>	<b>4</b>	<b>22</b>	<b>13</b>	<b>10</b>		✓	✓	✓	✓	✓	<b>45</b>			✓	✓	✓

SECTION B																			
Question 2																			
	A	B	C	BC	SC1	SC2	1	2	3	4	5	TOT	I	P	D	L	E	O	S
2.1.1	4			4				✓				2			✓				
2.1.2		4		4				✓				3							✓
2.1.3		2		2								2							✓
2.1.4		3		3				✓				4						✓	
2.2.1	1			1				✓				5						✓	
2.2.2		4		4				✓				4						✓	
2.3.1			1	1							✓	2						✓	
2.3.2			6	6				✓				1		✓					
2.3.3	2			2				✓		✓		3							✓
2.4.1	2			2				✓				2							✓
2.4.2	2			2						✓		5							✓
2.5.1		2		2						✓		2						✓	
2.5.2			2	2				✓											✓
<b>Sub-total</b>	<b>11</b>	<b>15</b>	<b>9</b>	<b>35</b>				✓		✓	✓	<b>35</b>		✓	✓	✓	✓	✓	✓

NSC – Grade 11 – Marking Guidelines

Question 3																			
	A	B	C	BC	SC1	SC2	1	2	3	4	5	TOT	I	P	D	L	E	O	S
3.1.1			9		9			✓				1		✓					
3.1.2			3		3						✓	1							✓
3.2.1	2				2			✓				2						✓	
3.2.2	2				2		✓	✓				3						✓	
3.2.3		3			3						✓	4						✓	
3.3.1		2			2				✓			3							✓
3.3.2		2			2					✓		3							✓
3.3.3		2			2						✓	2							✓
3.4.1	3				3			✓				5						✓	
3.4.2		6			6		✓			✓		2						✓	
3.4.3	1				1				✓			3						✓	
<b>Sub-total</b>	<b>8</b>	<b>15</b>	<b>12</b>		<b>35</b>		✓	✓	✓	✓	✓	<b>35</b>		✓				✓	✓
Question 4																			
	A	B	C	BC	SC1	SC2	1	2	3	4	5	TOT	I	P	D	L	E	O	S
4.1.1	6					6		✓				6						✓	
4.1.2		6				6				✓		6							✓
4.2.1			2			2		✓				2							✓
4.2.2	2					2		✓				2						✓	
4.3.1	2					2		✓		✓		2						✓	
4.3.2	2					2		✓		✓		2						✓	
4.3.3		4				4	✓		✓			4						✓	
4.3.4		4				4				✓		4						✓	
4.4.1	2					2		✓				2						✓	
4.4.2			4			4	✓				✓	4						✓	
4.4.3	1					1		✓				1						✓	
<b>Sub-total</b>	<b>15</b>	<b>14</b>	<b>6</b>			<b>35</b>	✓	✓	✓	✓	✓	<b>35</b>						✓	✓
<b>Sub-total B</b>	<b>34</b>	<b>44</b>	<b>27</b>	<b>35</b>	<b>35</b>	<b>35</b>						<b>105</b>							
<b>Sub-total A</b>	<b>26</b>	<b>15</b>	<b>4</b>	<b>22</b>	<b>13</b>	<b>12</b>						<b>45</b>							
<b>Total</b>	<b>60</b>	<b>59</b>	<b>31</b>	<b>57</b>	<b>48</b>	<b>47</b>						<b>150</b>							
<b>Norm</b>	<b>60</b>	<b>60</b>	<b>30</b>	<b>50</b>	<b>50</b>	<b>50</b>	✓	✓	✓	✓	✓	<b>150</b>	✓	✓	✓	✓	✓	✓	✓