



## **education**

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Noordwes Departement van Onderwys  
North West Department of Education  
**NORTH WEST PROVINCE**

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**LIFE SCIENCES P1  
SEPTEMBER 2021  
MARKING GUIDELINE**

**MARKS: 150**

**This marking guideline consists of 10 pages  
and 2 pages with the cognitive grid**

**PRINCIPLES RELATED TO MARKING LIFE SCIENCES 2021**

- 1. If more information than marks allocated is given**  
Stop marking when maximum marks are reached and put a wavy line and 'max' in the right-hand margin.
- 2. If, for example, three reasons are required and five are given**  
Mark the first three irrespective of whether all or some are correct/incorrect.
- 3. If whole process is given when only part of it is required**  
Read all and credit relevant part.
- 4. If comparisons are asked for, but descriptions are given**  
Accept if differences/similarities are clear.
- 5. If tabulation is required, but paragraphs are given**  
Candidates will lose marks for not tabulating.
- 6. If diagrams are given with annotations when descriptions are required**  
Candidates will lose marks.
- 7. If flow charts are given instead of descriptions**  
Candidates will lose marks.
- 8. If sequence is muddled and links do not make sense**  
Where sequence and links are correct, credit. Where sequence and links are incorrect, do not credit. If sequence and links become correct again, resume credit.
- 9. Non-recognised abbreviations**  
Accept if first defined in answer. If not defined, do not credit the unrecognised abbreviation but credit the rest of answer if correct.
- 10. Wrong numbering**  
If answer fits into the correct sequence of questions but the wrong number is given, it is acceptable.
- 11. If language used changes the intended meaning**  
Do not accept.
- 12. Spelling errors**  
If recognisable accept, provided it does not mean something else in Life Sciences or if it is out of context.
- 13. If common names given in terminology**  
Accept, provided it was accepted at the National memo discussion meeting.

- 14. If only letter is asked for, but only name is given (and vice versa)**  
No credit.
- 15. If units are not given in measurements**  
Candidates will lose marks. Marking guidelines will allocate marks for units separately.
- 16. Be sensitive to the sense of an answer, which may be stated in a different way.**
- 17. Caption**  
All illustrations (diagrams, graphs, tables, etc.) must have a caption.
- 18. Code-switching of official languages (terms and concepts)**  
A single word or two that appears in any official language other than the learners' assessment language used to the greatest extent in his/her answers should be credited, if it is correct. A marker that is proficient in the relevant official language should be consulted. This is applicable to all official languages.
- 19. No changes must be made to the marking guidelines without consulting the provincial internal moderator.**

**SECTION A****QUESTION 1**

1.1	1.1.1	D✓✓	
	1.1.2	B✓✓	
	1.1.3	D✓✓	
	1.1.4	B✓✓	
	1.1.5	B✓✓	
	1.1.6	B✓✓	
	1.1.7	C✓✓	
	1.1.8	A✓✓	
	1.1.9	B✓✓	
	1.1.10	A✓✓	(10 x 2) <b>(20)</b>
1.2	1.2.1	Parasympathetic✓ nervous system	
	1.2.2	Neuron✓	
	1.2.3	Thermoregulation✓	
	1.2.4	ADH✓/Anti-diuretic hormone	
	1.2.5	Phototropism✓	
	1.2.6	Cones✓	
	1.2.7	Amniotic✓ egg	<b>(7)</b>
1.3	1.3.1	B only✓✓	
	1.3.2	A only✓✓	
	1.3.3	B only✓✓	(3 x 2) <b>(6)</b>
1.4	1.4.1	Corpus callosum✓	(1)
	1.4.2	(a) C ✓ Medulla oblongata✓	
		(b) E✓ Cerebrum✓	
		(c) A✓ Cerebellum✓	(6)
			<b>(7)</b>
1.5	1.5.1	(a) A - Jelly✓ layer/zona pellucida	(1)
		(b) G- Middle portion✓/neck	(1)
		(c) C - Cytoplasm✓/cytosol	(1)
		(d) F - Nucleus✓	(1)
	1.5.2	(a) Middle portion/neck✓	(1)
		(b) Tail✓	(1)
		(c) Acrosome✓	(1)
		(d) Nucleus✓	(1)
	1.5.3	(a) Cells of Leydig✓	(1)
		(b) Testosterone✓	(1)
			<b>(10)</b>

**TOTAL SECTION A: 50**

**SECTION B****QUESTION 2**

- |     |       |   |   |
|-----|-------|---|---|
| 2.1 | 2.1.1 | (a) Vas deferens✓/sperm duct<br>(b) Scrotum ✓   | (1)<br>(1)                                |
|     | 2.1.2 | E✓<br>F✓  | (2)                                       |
|     | 2.1.3 | - The laptop radiates/give heat to the body✓<br>- The temperature of the testes will be higher✓ because<br>- the scrotum cannot function normally✓<br>- Sperm production will not be at an optimum✓<br>- therefore producing less sperm✓ or<br>- sperm with a low quality✓<br>- which reduces the chance of fertilization✓/decreasing fertility | Any (4)<br><b>(8)</b>                     |
| 2.2 | 2.2.1 | Day 14✓   | (1)                                       |
|     | 2.2.2 | - Corpus luteum✓<br>- degenerates✓ therefore progesterone levels drop   | (2)                                       |
|     | 2.2.3 | - The woman is <b>not</b> pregnant✓<br>- The concentration of progesterone is decreasing✓   | (2)                                       |
|     | 2.2.4 | - Follicle begins to develop✓<br>- due to FSH✓/Follicle Stimulating Hormone<br>- A mature Graafian follicle develops✓,<br>- which secretes oestrogen✓<br>- Graafian follicle bursts to release an ovum✓/ovulation   | Any (3)<br><b>(Mark first THREE only)</b> |
|     | 2.2.5 | Oogenesis✓  | (1)                                       |
|     | 2.2.6 | - No follicle will develop✓<br>- No oestrogen✓<br>- to thicken the endometrium✓<br>- which is shed✓ during menstruation   | (4)<br><b>(13)</b>                        |

- 2.3 2.3.1 (a) Lens✓ (1)
- (b) Choroid✓ (1)
- 2.3.2 Long-sightedness✓/hyperopia/hypermopia (1)
- 2.3.3 - Cannot see nearby objects clearly✓  
- causing the image to be blurred✓ (2)
- 2.3.4 - No receptors✓ present/rods and cones  
- No image will be formed✓/cannot see the object  
- Light will not be converted into an impulse✓ (3)
- 2.3.5 - Lens is elastic✓ therefore  
- can change shape✓/convexity/allow for accommodation  
- Lens is transparent✓ to allow light rays to pass through✓  
- Lens is biconvex✓ to refract light rays✓ (4)
- Any 2 x 2 (4)
- (12)**
- 2.4 As the soccer player dives  
- A change in direction and speed ✓ of the body  
- stimulates the cristae✓  
- A change in the position of the head✓  
- stimulates the maculae ✓  
- The stimuli are converted into impulses✓  
- which are transported along the auditory nerve✓  
- and interpreted by the cerebellum✓  
- which sends impulses to the muscles✓ to restore balance and equilibrium Any (5)
- 2.5 2.5.1 (a) Anvil✓ (1)
- (b) Eustachian tube✓ (1)
- 2.5.2 Middle ear✓ (1)
- 2.5.3 Allows ossicles/tympanum to vibrate freely✓ (1)
- 2.5.4 Round window✓ (1)
- 2.5.5 - E/the tympanic membrane is larger✓/larger surface area  
- than B/the oval window/smaller surface area✓  
- Therefore the incoming sound waves are concentrated✓ onto a  
smaller area thus amplifying the sound (3)

- 2.5.6 (a) (Small cut) in the tympanic membrane✓ (1)
- (b) - Due to the infection the Eustachian tube cannot function properly✓  
 - Air pressure in the middle ear would differ from atmospheric pressure✓/air cannot be replaced in the middle ear  
 - and fluid accumulates in the middle ear cavity✓  
 - The tympanic membrane is unable to vibrate✓ and  
 - vibrations are not being transmitted to the oval window✓ Any (3)  
**(12)**  
**[50]**

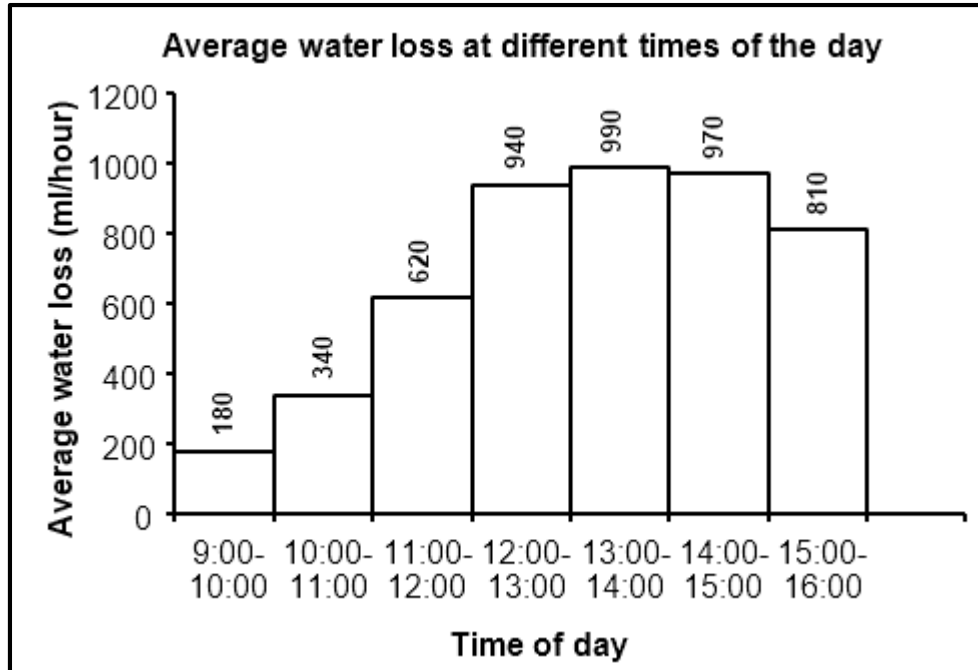
**QUESTION 3**

- 3.1 3.1.1 Apical dominance✓ (1)
- 3.1.2  $(120 - 80)✓ \text{ mm} = 40✓ \text{ mm}✓$  (3)
- 3.1.3 - Increase the number of plants used in each treatment✓  
 - Repeat the investigation✓  
 - Increase the period of the investigation✓ Any (2)  
**(Mark first TWO only)**
- 3.1.4 - A high concentration of auxins diffused from the paste into plants✓  
 - inhibiting growth of the lateral branches✓  
 - Once all the auxins were used up✓ from the paste  
 - the growth of the lateral branches increased✓ (4)  
**(10)**
- 3.2 3.2.1 - Frequent urination✓/  
 - Increased thirst✓/  
 - increased appetite✓ Any (1)  
**(Mark first ONE only)**
- 3.2.2 Insulin✓ (1)
- 3.2.3 Pancreas✓ (1)
- 3.2.4 Glucagon✓  
 Adrenalin✓  
 Thyroxin✓ Any (2)  
**(Mark first TWO only)**  
**(5)**

3.3 3.3.1 (13:00 - 14:00) ✓

(1)

3.3.2



**Guideline for assessing the graph**

Criteria	ELABORATION	MARK
Correct type of graph (T)	Histogram drawn	1
Caption of graph (C)	Both variables included	1
Axes labels (L)	X- and Y-axis correctly labelled with units	1
Scale for X- and Y-axis (S)	- Same width of bars for X-axis and - Correct scale for Y-axis	1
Plotting of bars (P)	1 to 4 bars plotted correctly	1
	All 5 bars plotted correctly	2

(6)  
(7)

3.4 - Ovoviviparous females keep their eggs inside their bodies ✓  
 which means less chance for being eaten/broken by predators ✓  
 - Oviparous females lay their eggs outside the body which are vulnerable to predators ✓

(3)

3.5 - The egg of the pigeon holds the yolk ✓  
 - which serves as the nutrition ✓ for the developing embryo inside the egg  
 - The shell ✓ allows oxygen to diffuse through the membrane  
 - whereas the human egg is so small because it need not include the nourishment ✓ for the developing embryo,  
 - because it gets it nutrition through the placenta ✓ from the mother

Any (4)



3.6 3.6.1 Pituitary gland✓/hypophysis (1)  
**(Mark first ONE only)**

- 3.6.2 - Secretes thyroxin✓  
- Raises and control basal metabolic rate✓/respiration  
- Affects physical growth and development✓ of the body  
- Increases the activity of the nervous system✓  
- Increases cardiac output✓/heart metabolism rate/heartbeat rate  
- Affects the gastrointestinal system✓ Any (1)  
**(Mark first ONE only)**

- 3.6.3 When thyroxin level is too low in the blood  
- The pituitary gland✓/hypophysis  
- is stimulated to secrete more TSH✓  
- which stimulates the thyroid gland✓  
- to secrete more thyroxin✓ and  
- thyroxin level in the blood raised to normal✓ limits (5)

**OR**

When thyroid level in blood becomes too high

- The pituitary gland✓/hypophysis
- reduce the production of TSH✓
- and thyroid gland✓
- produce less/no thyroxin✓ and
- thyroxin level is reduced to normal✓ limits

**(7)**

3.7 3.7.1 Pupillary mechanism✓/pupil reflex (1)

- 3.7.2 - Radial muscles of the iris contract✓  
- Circular muscles of the iris relax✓  
- Pupil dilates✓ /widens/gets bigger and  
- more light✓ enters the eye (4)

**(5)**

3.8 3.8.1  $(38,2 - 36,8) = 1,4^{\circ}\text{C}$  ✓ (1)

3.8.2 **Increase in temperature when exercise starts:**

- Due to exercise ✓
  - the body temperature increased ✓ / from  $36,8^{\circ}\text{C}$  to  $38,2^{\circ}\text{C}$
  - because of heat ✓ produced
  - from an increase in the rate of cellular respiration ✓
  - to meet the energy demands ✓ during exercise
- Any (4)

**Decrease in body temperature when exercise ends:**

- The temperature decreased ✓ / from  $38,2^{\circ}\text{C}$  back to  $36,8^{\circ}\text{C}$  after the exercise
  - The heat-regulating center in the brain ✓ / hypothalamus was stimulated by the increased temperature
  - causing the blood vessels of the skin to dilate ✓ / vasodilation
  - allowing more blood flow through the skin ✓
  - resulting in greater heat loss ✓
  - Also more sweat evaporated ✓ from the skin surface
  - cooling down ✓ the skin
- Any (4)

**(9)**  
**[50]**

**TOTAL SECTION B: [100]**  
**GRAND TOTAL [150]**

Life Sciences Grade																	
QUESTION ANALYSIS GRID																	
	Cognitive Levels				Topics								TOTAL	Difficulty Levels			
	A	B	C	D	Reproduction vertebrates	Human reproduction	Responding Humans	Human endocrine system and	Responding Plants						Easy	Moderate	Difficult
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	1						1							1			
1.2.2	1						1							1			
1.2.3	1							1						1			
1.2.4	1							1						1			
1.2.5	1								1					1			
1.2.6	1						1							1			
1.2.7	1				1									1			
1.3.1		2					2							2			
1.3.2		2					2							2			
1.3.3		2							2					2			
1.4.1	1						1								1		
1.4.2	3	3					6								6		
1.5.1(a)	1					1								1			
1.5.1(b)	1					1								1			
1.5.1(c)	1					1								1			
1.5.1(d)	1					1								1			
1.5.2(a)	1					1									1		
1.5.2(b)	1					1									1		
1.5.3(c)	1					1									1		
1.5.2(d)	1					1									1		
1.5.3(a)	1					1										1	
1.5.3(b)	1					1										1	
<b>Ques 1</b>	<b>35</b>	<b>13</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>20</b>	<b>20</b>	<b>6</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>50</b>				
2.1.1(a)	1					1								1			
2.1.1(b)	1					1								1			
2.1.2	2					2								2			
2.1.3				4		4									4		
2.2.1	1					1									1		
2.2.2		2				2									2		
2.2.3		2				2									2		
2.2.4		3				3									3		
2.2.5	1					1								1			
2.2.6		4				4									4		
2.3.1 (a)	1						1							1			
2.3.1 (b)	1						1							1			
2.3.2	1						1								1		
2.3.3			2				2								2		
2.3.4				3			3								3		
2.3.5			4				4								4		

Life Sciences Grade																	
QUESTION ANALYSIS GRID																	
	Cognitive Levels				Topics								TOTAL	Difficulty Levels			
	A	B	C	D	Reproduction vertebrates	Human reproduction	Responding Humans	Human endocrine system and	Responding Plants						Easy	Moderate	Difficult
2.4				5			5										5
2.5.1(a)	1						1							1			
2.5.1(b)	1						1							1			
2.5.2	1						1							1			
2.5.3	1						1								1		
2.5.4	1						1								1		
2.5.5			3				3										3
2.5.6(a)	1						1							1			
2.5.6(b)				3			3									3	
<b>Ques 2</b>	<b>15</b>	<b>11</b>	<b>9</b>	<b>15</b>	<b>0</b>	<b>21</b>	<b>29</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>50</b>				
3.1.1				1					1							1	
3.1.2		3							3						3		
3.1.3				2					2							2	
3.1.4				4					4							4	
3.2.1	1							1						1			
3.2.2	1							1						1			
3.2.3	1							1						1			
3.2.4	2							2							2		
3.3.1		1						1							1		
3.3.2	2	3	1					6							2	4	
3.4		3			3									3			
3.5			4		4										4		
3.6.1	1							1						1			
3.6.2		1						1							1		
3.6.3			5					5							5		
3.7.1		1						1							1		
3.7.2		4						4							4		
3.8.1			2					2								2	
3.8.2			7					7							7		
<b>Ques 3</b>	<b>8</b>	<b>16</b>	<b>19</b>	<b>7</b>	<b>7</b>	<b>0</b>	<b>5</b>	<b>28</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>50</b>				
<b>Ques 4</b>													<b>0</b>				
<b>SUMMARY</b>																	
<b>QUES 1</b>	<b>35</b>	<b>13</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>20</b>	<b>20</b>	<b>6</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>50</b>				
<b>QUES 2</b>	<b>15</b>	<b>11</b>	<b>9</b>	<b>15</b>	<b>0</b>	<b>21</b>	<b>29</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>50</b>				
<b>QUES 3</b>	<b>8</b>	<b>16</b>	<b>19</b>	<b>7</b>	<b>7</b>	<b>0</b>	<b>5</b>	<b>28</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>50</b>				
<b>QUES 4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
<b>Total marks</b>	<b>58</b>	<b>40</b>	<b>30</b>	<b>22</b>	<b>8</b>	<b>41</b>	<b>54</b>	<b>34</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>150</b>	<b>46</b>	<b>59</b>	<b>37</b>	<b>8</b>
<b>Norm marks</b>	<b>60</b>	<b>38</b>	<b>30</b>	<b>22</b>	<b>8</b>	<b>41</b>	<b>54</b>	<b>34</b>	<b>13</b>				<b>150</b>	<b>45</b>	<b>60</b>	<b>38</b>	<b>7</b>
<b>Total %</b>	<b>39</b>	<b>27</b>	<b>20</b>	<b>15</b>	<b>5</b>	<b>27</b>	<b>36</b>	<b>23</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>31</b>	<b>39</b>	<b>25</b>	<b>5.3</b>
<b>Norm %</b>	<b>40</b>	<b>25</b>	<b>20</b>	<b>15</b>	<b>5</b>	<b>27</b>	<b>36</b>	<b>23</b>	<b>9</b>				<b>100</b>	<b>30</b>	<b>40</b>	<b>25</b>	<b>5</b>
				Norm	<b>150</b>												
				Total	<b>150</b>												