Education and Sport Development

Department of Education and Sport Development
Departement van Onderwys en Sportontwikkeling
Lefapha la Thuto le Tlhabololo ya Metshameko
NORTH WEST PROVINCE

NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES P1

SEPTEMBER 2019

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 12 pages and cognitive levels of 4 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES 2019

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)**
Do not credit.

15. **If units are not given in measurements**
Candidates will lose marks. Memorandum 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 appear(s) 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. **Changes in the memorandum**
No changes must be made to the marking memoranda without consulting th**e** provincial internal moderator.

SECTION A
QUESTION 1

1.1	1.1.1	B ✓✓		
	1.1.2	B✓✓		
	1.1.3	D✓✓		
	1.1.4	C✓✓		
	1.1.5	C✓✓		
	1.1.6	B✓✓		
	1.1.7	C✓✓		
	1.1.8	A✓✓		
	1.1.9	D✓✓		
	1.1.10	C✓✓	(10 x 2)	**(20)**
1.2	1.2.1	Aldosterone✓		
	1.2.2	Neuron✓		
	1.2.3	Testosterone✓		
	1.2.4	Chorion✓		
	1.2.5	Glucagon✓		
	1.2.6	Multiple sclerosis✓		
	1.2.7	Allantois✓		
	1.2.8	Conjuctiva✓		
	1.2.9	Hypophysis/Pituitary gland✓		
	1.2.10	Endocrine✓		**(10)**
1.3	1.3.1	None ✓✓		
	1.3.2	B only✓✓		
	1.3.3	None✓✓	(3 x 2)	**(6)**
1.4	1.4.1	B - Chromatid/s✓ C - Centromere✓ D - Centriole✓		(3)
	1.4.2	(a) Metaphase II✓		(1)
		(b) Anaphase I✓		(1)
	1.4.3	- Homologous chromosomes are separating✓/ chromosomes are moving apart - Spindle threads contract✓ **(MARK FIRST ONE ONLY)**	Any	(1)
	1.4.4	- Each chromosome has DNA/a segment from the other chromosome✓ - Each has a mixture of maternal and paternal DNA✓	Any	(1)
	1.4.5	Two✓/2		(1)
	1.4.6	A✓		(1) **(9)**

1.5	1.5.1	A reflex action✓	(1)
	1.5.2	Motor✓ neuron	(1)
	1.5.3	(a) Synapse✓	(1)
		(b) - Sensory✓ neuron and - connector✓ neuron/interneuron	(2) **(5)**

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 A ï Middle piece✓ (1)

2.1.2 Mitochondria✓: supplies energy✓ for locomotion of the sperm cell
Tail✓: can propel forward✓ for swimming/locomotion of the sperm cell
Torpedo shape✓: reducing friction✓
(MARK FIRST TWO ONLY) Any 2 x 2 (4)

2.1.3 - Acrosome*✓
- therefore will be no enzymes✓
- Sperm will be unable to penetrate the ovum✓
- therefore no fertilisation will occur✓ **1 * compulsory + 3** (4)
(9)

2.2 2.2.1 TSH✓ (1)

2.2.2 - Hypophysis✓/ Pituitary gland is stimulated to
- secrete less TSH✓
- causing the thyroid gland✓
- to secrete less thyroxin✓
- decreasing the level/concentration of thyroxin✓ returning it to normal Any (4)

2.2.3 - Due to increased basal metabolic rate✓/ cell respiration in mitochondria
- body mass will decrease✓
(MARK FIRST ONE ONLY) (2)
(7)

2.3 2.3.1 - Adrenalin increases the heart rate✓ therefore more oxygen/glucose supplied to muscles/brain/sense organs✓
- The rate and depth of breathing increases✓ to increase the amount of oxygen in the blood✓
- Respiration increases✓ and more energy is available by increasing conversion of glycogen into glucose✓ to allow the person to respond faster/with more strength
(MARK FIRST TWO ONLY) Any 2 x 2 (4)

2.3.2 - The hypothalamus✓ is stimulated
- impulses are send to the blood vessels in the skin to dilate✓/vasodilation
- consequently more blood flows✓ through the surface of the skin
- more blood flows to the sweat glands✓
- increased evaporation✓occurs
- consequently more heat is lost✓ Any (4)
(8)

2.4 2.4.1 - Blood✓
- Urine✓
(MARK FIRST ONE ONLY) Any (1)

2.4.2 - Hepatic✓/liver cells
- Muscle cells✓
(MARK FIRST TWO ONLY) (2)

2.4.3 - The body cannot reduce blood glucose level✓
- therefore they have to inject themselves daily with insulin✓ (2)
(5)

2.5 2.5.1 C - Cochlea✓

D - Round window✓ (2)

2.5.2 Cristae✓ (1)

2.5.3 (a) - Impulses from the cochlea cannot be transmitted to the cerebrum✓
- and therefore hearing will not occur✓ (2)

(b) - Part D/round window will not be able to release pressure✓
- The round window/part D will not absorb the pressure waves✓ from the cochlea
- and hearing will decrease✓/echoes will occur Any (2)
(7)

2.6 2.6.1 - Refracts light rays entering✓
- to focus them on retina✓ (2)

2.6.2 - Refracts/bend light rays✓
- Allowing light to enter the eye✓ (2)
(4)
[40]

QUESTION 3

3.1 3.1.1 Amount of auxin distributed✓ (1)

3.1.2 - To act as a control✓
- to validate the results✓ (2)

3.1.3 (a) - Repeat the investigation✓
- Use more than 10 shoots✓/a larger sample
(MARK FIRST TWO ONLY) (2)

(b) - Using plants of the same age✓
- Using plants of the same species✓
- Treating plants in the same way✓/time
(MARK FIRST THREE ONLY) (3)
(8)

3.2 3.2.1 Accommodation✓ (1)

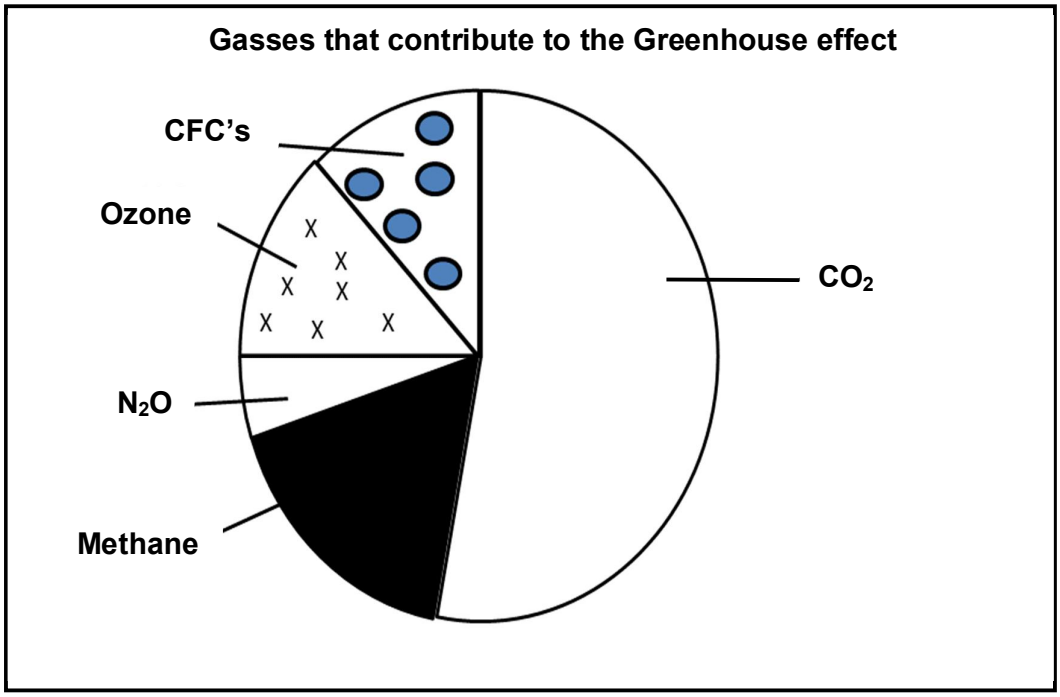
3.2.2 (a) E✓ (1)

(b) B✓/D Any 1 (1)

3.2.3 - The ciliary muscles relax✓
- Suspensory ligaments become taut✓/stretched
- and the lens becomes less convex✓/flatter
- decreasing the refractive power of the lens✓
maintaining a clear image (4)
(7)

3.3 3.3.1 53 + 5 + 13 +12 = 83
= 100 - 83✓
= 17%✓ (2)

3.3.2



MARK ALLOCATION FOR THE PIE CHART	
Title of graph ï both variables included	1
Pie chart drawn	1
1 ï 4 Sectors correctly indicated/labelled 5 Sectors correctly indicated/labelled	1 2
1 ï 4 Sectors correctly calculated 5 Sectors correctly calculated	1 2

NOTE: If wrong type of graph is drawn:
Mark will be lost for type of graph as well as for the drawing and labelling of sectors. (Max 4/6) (6)
(8)

3.4 3.4.1 - Food security refers to the availabilty and access✓
- to adequate, safe and nutritious food✓
- to people at all times✓ Any (2)

3.4.2 - Carbon footprint is a measure of the total amount of greenhouse gas emissions✓(example of greenhouse gas)
- of an individual✓ /defined population/ company per year (2)
(4)

3.5 3.5.1
- Urbanisation✓
- Agricultural needs✓
- Wood as a source of fuel✓
- Serve as timber and mining material✓
- Medicinal uses✓
- Road construction/improve infrastructure✓

(MARK FIRST TWO ONLY) Any (2)

3.5.2
- Loss of habitat✓ results in death✓/migration/extinction of organisms
- Balance between oxygen and carbon dioxide is disturbed✓ fewer plants to photosynthesise✓
- Food chains are disturbed✓ species die out✓/migrate
- Degradation of habitat✓ leading to more erosion✓
- Greenhouse gas emissions increase✓ leading to global climate change✓

(MARK FIRST TWO ONLY) Any 2 x 2 (4)
(6)

3.6 3.6.1
- The increase in the temperature of the earth✓
- because of the enhanced greenhouse effect✓/increased in the carbondioxide concentration in the atmosphere. (2)

3.6.2
- Large amount of nutrients/ minerals cause drastic increase in growth of fresh water algae/algal bloom✓
- This blocks the sunlight✓from other photosynthesizing plants
- causing them to die✓
- The dead plant material decompose✓
- leading to increase in decomposition bacteria✓
- The bacteria use large amounts of oxygen for process of decomposition✓
- causing other organisms to die due to lack of oxygen✓
- The process is called eutrophication✓* **1* compulsory + any 4** (5)

(7)
[40]

TOTAL SECTION B: 80

SECTION C

QUESTION 4

Oogenesis

- Under the influence of FSH✓
- diploid cells in the ovary undergo mitosis✓
- to form numerous follicles✓
- One cell inside a follicle enlarges✓
- and undergoes meiosis✓
- Of four cells that are produced, only one survives✓
- to form a mature, haploid ovum✓ Any (4)

The role of hormones during the menstrual cycle

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- The hypophysis✓/pituitary gland
- secretes FSH✓
- which stimulates the development of a primary follicle✓
- in one of the ovaries✓
- Only one follicle develops to full maturity in every cycle✓
- into a mature Graafian follicle✓
- around day 14✓
- The mature Graafian follicle moves to the surface of the ovary✓
- forming a slight swelling✓
- There is a sharp increase in the concentration of LH✓
- The wall of the ovary ruptures✓
- The ovum✓/haploid secondary oocyte is released
- which is known as ovulation✓
- After ovulation the remains of the Graafian follicle✓ develop
- into a mass of yellow cells✓ the corpus luteum Any (10)

If fertilisation took place

- The corpus luteum✓
- produces progesterone✓
- It inhibits✓
- the secretion of FSH✓
- Therefore preventing the stimulation of development of primary follicles✓ Any (3)

Content: **(17)**
Synthesis: **(3)**
(20)

ASSESSING THE PRESENTATION OF THE ESSAY

Relevance	Logical sequence	Comprehensive
All information provided is relevant to the question	Ideas arranged in a logical /cause-effect sequence	Answered all aspects required by the essay in sufficient detail
All the information provided is relevant to: - Oogenesis, and - the role of hormones during the menstrual cycle - fertilisation took place. There is no irrelevant information.	All the information regarding: - Oogenesis, and - the role of hormones during the menstrual cycle - fertilisation took place. is arranged in logical manner	At least the following points should be included: - Oogenesis **(2/4)** - The role of hormones during the menstrual cycle **(6/10)** - fertilisation took place **(1/3)**
1 mark	1 mark	1 mark

TOTAL SECTION C: 20
GRAND TOTAL: 150

LIFE SCIENCES PAPER 1 2019: QUESTION ANALYSIS GRID															
	A	**B**	**C**	**D**				**Meiosis**	**Reproduction: vertebrates**	**Human reproduction**	**Responding: Humans**	**Human endocrine system**	**Homeostasis in humans**	**Responding: Plants**	**Human impact on the environment**
1.1															
1.1.1	2								2						
1.1.2		2									2				
1.1.3		2									2				
1.1.4	2											2			
1.1.5	2													2	
1.1.6	2								2						
1.1.7	2							2							
1.1.8				2							2				
1.1.9				2							2				
1.1.10		2									2				
1.2															
1.2.1	1												1		
1.2.2	1										1				
1.2.3	1									1					
1.2.4	1									1					
1.2.5	1												1		
1.2.6	1										1				
1.2.7	1								1						
1.2.8	1										1				
1.2.9	1											1			
1.2.10	1											1			
1.3															
1.3.1		2									2				
1.3.2		2													2
1.3.3		2									2				

1.4															
1.4.1	3							3							
1.4.2	2							2							
1.4.3		1						1							
1.4.4		1						1							
1.4.5		1						1							
1.4.6	1							1							
1.5															
1.5.1	1										1				
1.5.2	1										1				
1.5.3 a	1										1				
b	2										2				
Quest 1	**31**	**15**	**0**	**4**				**11**	**5**	**2**	**22**	**4**	**2**	**2**	**2**

	A	**B**	**C**	**D**				**Meiosis**	**Reproduction: vertebrates**	**Human reproduction**	**Responding: Humans**	**Human endocrine system**	**Homeostasis in humans**	**Responding: Plants**	**Human impact on the environment**
2.1															
2.1.1	1									1					
2.1.2		4								4					
2.1.3			4							4					
2.2															
2.2.1	1											1			
2.2.2			4									4			
2.2.3			2									2			
2.3															
2.3.1			4									4			
2.3.2			4										4		
2.4															
2.4.1	1												1		
2.4.2		2											2		
2.4.3			2										2		

2.5															
2.5.1	2										2				
2.5.2	1										1				
2.5.3 a			2								2				
b				2							2				
2.6.1		2									2				
2.6.2		2									2				
Quest 2	**6**	**10**	**22**	**2**				**0**	**0**	**9**	**11**	**11**	**9**	**0**	**0**

	A	B	C	D				**Meiosis**	**Reproduction: vertebrates**	**Human reproduction**	**Responding: Humans**	**Human endocrine system**	**Homeostasis in humans**	**Responding: Plants**	**Human impact on the environment**
3.1															
3.1.1				1										1	
3.1.2				2										2	
3.1.3(a)				2										2	
3.1.3(b)				3										3	
3.2															
3.2.1	1										1				
3.2.2(a)				1							1				
3.2.2(b)				1							1				
3.2.3				4							4				
3.3															
3.3.1		2													2
3.3.2	1	2	3												6
3.4.1	2														2
3.4.2	2														2
3.5															
3.5.1	2														2
3.5.2			4												4

3.6															
3.6.1	2														2
3.6.2		5													5
Total	**10**	**9**	**7**	**14**				**0**	**0**	**0**	**7**	**0**	**0**	**8**	**25**

	A	**B**	**C**	**D**				**Meiosis**	**Reproduction: vertebrates**	**Human reproduction**	**Responding: Humans**	**Human endocrine system**	**Homeostasis in humans**	**Responding: Plants**	**Human impact on the environment**
Q4	9	8		3											
Total	**14**	**3**	**0**	**3**				**0**	**0**	**20**				**0**	**0**

Quest 4	**A**	**B**	**C**	**D**	**SA1**	**SA2**	**SA3**	**Meiosis**	**Reproduction: vertebrates**	**Human reproduction**	**Responding: Humans**	**Human endocrine system**	**Homeostasis in humans**	**Responding: Plants**	**Human impact on the environment**
Quest 1	**31**	**15**	**0**	**4**				**11**	**5**	**2**	**22**	**4**	**2**	**2**	**2**
Quest 2	**6**	**10**	**22**	**2**				**0**	**0**	**9**	**11**	**11**	**9**	**0**	**0**
Quest 3	**10**	**9**	**7**	**14**				**0**	**0**	**0**	**7**	**0**	**0**	**8**	**25**
Quest 4	**14**	**3**	**0**	**3**				**0**	**0**	**20**	**0**	**0**	**0**	**0**	**0**
Total	**61**	**37**	**29**	**23**				**11**	**5**	**31**	**40**	**15**	**11**	**10**	**27**
Norm	**60**	**38**	**30**	**22**				**11**	**6**	**31**	**40**	**15**	**11**	**11**	**25**