



**LIMPOPO**  
PROVINCIAL GOVERNMENT  
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF  
**EDUCATION**

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**LIFE SCIENCES PAPER 1  
SEPTEMBER EXAMINATION  
2021  
MARKING GUIDELINES**

**MARKS: 150**

**This MARKING GUIDELINES consists of 12 pages**

## MARKING GUIDELINES

**PRINCIPLES RELATED TO MARKING LIFE SCIENCES**

1. **If more information than marks allocated is given**  
Stop marking when maximum marks is 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 and 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 becomes correct again, resume credit.
9. **Non-recognized 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 recognizable, 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 and only name is given (and vice versa)**  
No credit.

## MARKING GUIDELINES

15. **If units are not given in measurements**  
Memorandum will allocate marks for units separately, except where it is already given in the question.
16. **Be sensitive to the sense of an answer, which may be stated in a different way.**
17. **Caption**  
Credit will be given for captions to all illustrations (diagrams, graphs, tables, etc.) except where it is already given in the question.
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.

**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 C ✓✓

1.1.9 C ✓✓

1.1.10 A ✓✓

**(10 x 2)****(20)**

1.2

1.2.1 Sympathetic✓ nervous system

1.2.2 Corpus callosum✓

1.2.3 ADH✓

1.2.4 Amniotic✓ fluid

1.2.5 Grommet✓

1.2.6 Acrosome✓

1.2.7 Neuron✓

1.2.8 Astigmatism✓

1.2.9 Cervix✓

1.2.10 Corpus luteum✓

**(10 x 1)****(10)**

1.3

1.3.1 A only✓✓

1.3.2 Both A and B ✓✓

1.3.3 B only✓✓

**(6)**

1.4

1.4.1

- (a) C✓ – Spinal cord✓ (2)
- (b) A✓ – Cerebrum✓ (2)
- (c) B✓ – Medulla oblongata✓ (2)

1.4.2 - Meninges✓

- Cranium✓

- Cerebrospinal fluid✓

**(Mark first TWO only)**Any (2)  
**(8)**

1.5

- 1.5.1 (a) A: Vas deferens✓/Sperm duct (1)
- (b) B: Epididymis✓ (1)
- (c) D: Urethra✓ (1)

1.5.2 - Prostate gland✓✓ (2)

1.5.3 - Stores sperms temporarily ✓ (1)  
**(6)****TOTAL QUESTION 1: [50]****TOTAL SECTION A :50**

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

## 2.1

2.1.1 14✓/15 (1)

2.1.2 - causes the follicle to burst open✓/stimulates ovulation  
- stimulates the formation of corpus luteum✓ (2)

2.1.3 - LH levels remain low up to day 12✓/13  
- then it increases sharply up to day 14✓  
- After which it decreases and remains low✓ (3)

2.1.4 - High levels of progesterone✓  
- inhibits the release of FSH✓  
- so that only one/no follicle develops✓  
- Therefore no ovum is released✓/ovulation  
- Thus there will be no fertilisation✓  
Any (3)

2.1.5 - corpus luteum degenerated✓  
- progesterone levels decreased✓  
- FSH levels start to increase✓  
- LH levels decrease✓ (4)

2.1.6 - The zygote divides mitotically✓  
- to form a mass of cells known as a morula✓  
- Morula divides mitotically✓  
- and forms a hollow filled cavity✓  
- known as a blastocyst✓ /blastula  
- The blastocyst is implanted on the thickened endometrium✓  
Any (5)

**(18)**

## 2.2

(a) C✓ (1)

(b) D✓ (1)

(c) A✓ (1)

(d) B✓ (1)

**(4)**

- 2.3 - receptors in the skin receive the stimulus✓  
 - stimulus is converted into a nerve impulse✓  
 - the impulse travels along the sensory neuron✓  
 - towards the spinal cord✓  
 - along the dorsal root of the spinal nerve✓  
 - in the spinal cord, the sensory neuron makes a synaptic contact with the connector/interneuron✓  
 - impulse is transported along the motor neuron✓  
 - along the ventral root✓ of the spinal nerve to the effector organ✓  
 - which contracts✓ and pulls the foot away
- Any (6)
- 2.4
- 2.4.1 Cell elongation✓ in the coleoptiles will increase✓ as the auxin concentration increases✓  
 OR  
 Cell elongation✓ will decrease✓ as the auxin concentration decreases✓  
 OR  
 Cell elongation✓ will remain the same✓ as the auxin concentration increases✓/decreases  
 OR  
 Cell elongation✓ will differ✓ as the auxin concentration differs✓  
 (3)
- 2.4.2 (a) Length of coleoptiles✓ (1)
- (b) Concentration/Amount of auxin✓ (1)
- 2.4.3 Removes the effect of auxin✓  
 To prevents different concentrations produced by each plant✓  
 (2)
- 2.4.4 One type of soil✓  
 Same amount of water✓/light intensity/ temperature  
 Same size of pot✓  
 Same environmental conditions✓  
**(Mark first TWO only)** (2)
- 2.4.5 Increasing the auxin concentration✓  
 Increases the cell elongation up to a certain optimum concentration✓  
 Then it decreases cell elongation✓  
 (3)  
**(12)**

## MARKING GUIDELINES

2.5

(a)

Precocial development	Altricial development
1. Young move around independently✓	1. Young are not able to move around✓
2. Likely to survive if one or both parents die✓	2. Young don't survive the death of a parent✓
3. Predators cannot target all the infants at once✓	3. Young are vulnerable to predators✓
4. Eggs hatch slower✓	4. Eggs hatch faster✓
5. Adult brain is smaller in relation to the body✓	5. Adult brain is larger in relation to the body✓
6. No care is required✓	6. Parental care is required✓

Any ( 2 x2) +1 for table (5)

- (b) - A method of reproduction in which the young develop inside the uterus✓of the mother after the eggs are fertilised internally✓and receive nutrients from placenta✓ (2)

- (c) - Acts as a microfilter✓/provide passive immunity to the foetus  
 - Acts as a shock absorber✓/prevents Mechanical injury  
 - prevents great variation in temperature✓  
 - Allows for free foetal movement✓/development and growth  
 - gaseous exchange✓  
 - Excretion✓  
**(Mark first THREE only)** (3)

(10)

**TOTAL QUESTION 2: 50**



**QUESTION 3**

## 3.1

3.1.1 B✓ (1)

3.1.2 C✓ (1)

3.1.3 D✓ (1)

3.1.4 - **Accommodation for near vision**✓/book less than 6m away  
 - ciliary muscles contract✓  
 - suspensory ligaments slacken✓  
 - tension on lens decreases✓  
 - lens become more convex✓  
 - refractive power of the lens increases✓  
 - a clear image of the book is formed on the retina✓  
 (5 + 1 compulsory mark \* **Accommodation**) Any (6)

**(9)**

## 3.2

## 3.2.1

(a) Pituitary✓ gland/hypophysis (1)

(b) Thyroid ✓gland (1)

(c) Pancreas✓ (1)

(d) Adrenal✓ gland (1)

## 3.3

3.3.1 - Kidney✓ (1)

- Liver✓/ muscles (1)

**3.3.2 When concentration of glucose rises to dangerous levels**

- kidneys are unable to reabsorb excess glucose✓  
 - glucose appears in urine✓  
 - can lead to kidney damage/failure✓ Any (2)

**When concentration of glucose drops to dangerous levels**

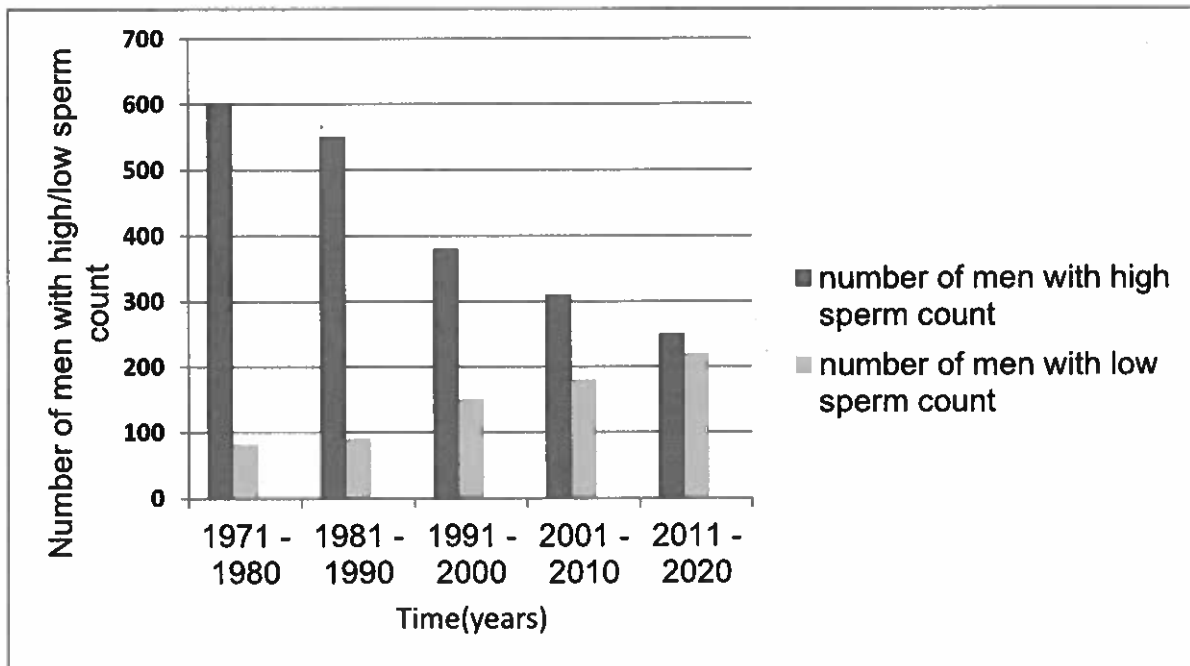
- glycogen is not stored in the liver and muscles✓  
 - glycogen cannot be converted to glucose✓  
 - can lead to diabetic coma/death✓ Any (2)

## MARKING GUIDELINES

- 3.3.3 - Insulin must be injected into the bloodstream✓  
- to stimulate the conversion of glucose to glycogen✓ (2)
- 3.3.4 Diabetes✓ (1)  
(9)
- 3.4
- 3.4.1 A maintenance of a constant internal environment✓by living organism within narrow limits, irrespective of changes in the external environment✓. (2)
- 3.4.2 Thermoregulation✓ (1)
- 3.4.3 Low✓ /Decreased environmental temperature (1)
- 3.4.4 - **Vasoconstriction**✓  
- less blood flows through the surface of skin✓  
- blood carries heat✓  
- therefore less heat is lost from the body✓  
- sweat glands produce less sweat✓  
- less cooling occurs ✓  
- Body temperature rises back to normal✓  
Any (5)  
(9)
- 3.5
- 3.5.1
- (a) A: Tympanic membrane✓/Ear drum (1)
- (b) B: Ossicles✓ (1)
- (c) C: Oval window✓ (1)
- 3.5.2 - prevents pressure build-up of waves✓  
- absorbs pressure waves from the inner ear✓ (2)
- 3.5.3 - head cold results in a blocked eustachian tube✓  
- there will be unequal pressure on both sides of the eardrum✓  
- the tympanic membrane may burst✓ Any (2)  
(7)
- 3.6
- 3.6.1 - 
$$\frac{600 - 250}{600} \times 100\%$$
  
= 58,3%✓ (3)

## 3.6.2

Comparison between number of men with high sperm count and men with low sperm count from 1971 to 2020



**Rubric to assess the graph**

Criteria	Mark allocation
Correct type of graph(T)	1
Correct title of the graph (both variables to be included)(C)	1
Correct label for X axis (L)	1
Correct label for Y axis	1
Correct scale for X axis and Y axis	1
Drawing of the graph	1: 1-4 bars plotted correctly 2: All 10 bars plotted correctly

(7)

- 3.6.3 - The number of men with low sperm count has increased from 1971 to 2020 ✓  
 - The number of men with high sperm count has decreased from 1971 to 2020 ✓ (2)

(12)

**TOTAL QUESTION 3: [50]  
 TOTAL SECTION B: [100]  
 GRAND TOTAL: 150**