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

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.

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) **A**ny (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)

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
- **Accomodation 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 * **Accomodation**) 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)

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)

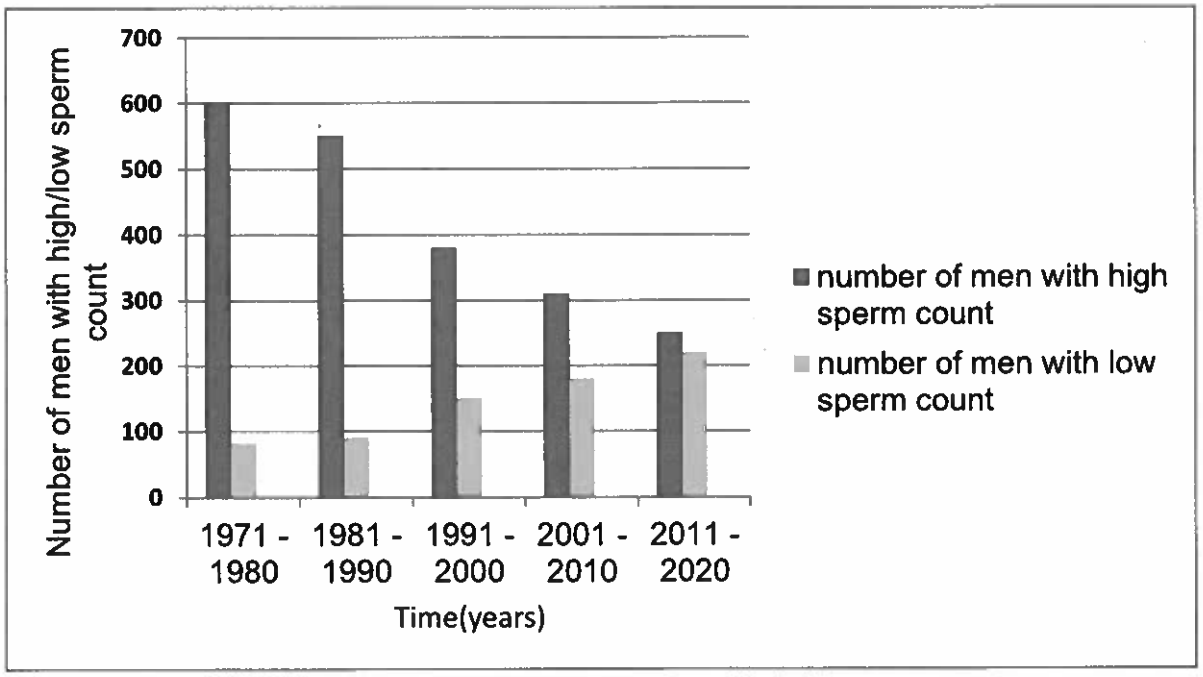
3.5.3 - head cold results in a blocked eustachian tube✓
- there will be unequal pressure on both sides of the eardrum✓
- the tympanic membrane may burst✓ Any (2)
(7)

3.6

3.6.1 - $\frac{600 - 250}{600}$✓x100%✓
= 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 2

(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