



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

**LIFE SCIENCES PRE-TRIAL P2
MARKING GUIDELINE
17 AUGUST 2026**

MARKS: 150

TIME: 2H30

This marking guide consists of 14 pages including the cover page

PRINCIPLES RELATED TO MARKING LIFE SCIENCES 2012

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 is incorrect, do not credit. If sequence and links becomes correct again, resume credit.

9. **Non-recognised abbreviations**

Accept if first defined in answer. If not defined, do not credit the unrecognized 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

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 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 memoranda without consulting the Provincial Internal Moderator who in turn will consult with the National Internal Moderator (and the External moderators where necessary)**20. Only memoranda bearing the signatures of the national Internal Moderator and the UMALUSI moderators and distributed by the National Department of Education via the Provinces must be used during training and during the marking period.**

SECTION A**QUESTION 1**

1.1.

1.1.1. D ✓ ✓

1.1.2. B ✓ ✓

1.1.3. A ✓ ✓

1.1.4. C ✓ ✓

1.1.5. A ✓ ✓

1.1.6. A ✓ ✓

1.1.7. B ✓ ✓

1.1.8. C ✓ ✓

1.1.9. C ✓ ✓

1.1.10. B ✓ ✓

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

1.2

1.2.1. Bipedalism ✓

1.2.2. Homologous ✓

1.2.3. Continuous ✓

1.2.4. Theory ✓

1.2.5. Centrioles ✓

1.2.6. Haemophilia ✓

1.2.7. Chloroplast ✓

(7 x1) **(7)**

1.3.

1.3.1. None ✓ ✓

1.3.2. A only ✓ ✓

1.3.3. B only ✓ ✓

(3x3) (6)

1.4.

1.4.1 Phylogenetic tree✓/ Cladogram (1)

1.4.2. *Ardipithecus* ✓ (1)

1.4.3. 2 ✓mya (1)

1.4.4. *Australopithecus afarensis* ✓ (1)1.4.5. *Homo neanderthalensis* ✓ (1)**(Mark first ONE only)**1.4.6. *Australopithecus Africanus* and *Homo habilis*✓✓ (2)**(7)**

1.5.

1.5.1 a. Nuclear membrane ✓ / Nucleus (2)

b. Polypeptide ✓ / protein

1.5.2. a. O ✓

b. L ✓

c. M ✓ (3)

1.5.3. TTA ✓✓ (2)

1.5.4. Leucine, Glutamine (correct order) ✓✓ / Leu, Glu (2)

1.5.5. mRNA / messenger RNA ✓ (1)

(10)**TOTAL SECTION A: 50****SECTION B**

QUESTION 2

2.1.

2.1.1 Epithelial ✓ tissue/ Cheek epithelial cells/ Blood tissue (1)

2.1.2. -DNA- profile bars of victims
-were compared ✓ to
-DNA-profile bars from toothbrush ✓/hairbrush /clothing samples provided by family members ✓
-If ALL the DNA bars /lines /stripes were the same, ✓ the person was identified. (4)

2.1.3. Victim's parents ✓ (1)

2.1.4. -The victim will share NO /FEW DNA bars/stripes /lines with their spouse ✓ (3)
-ALL the DNA bars /stripes /lines that do not match their mother ✓ will match their father ✓

2.1.5.
-Double stranded ✓
-Helix shaped ✓
-Nucleotides ✓consist out of deoxyribose, ✓ phosphate ✓ and a nitrogen base ✓/ T, C, G and A
-Nitrogen bases pair in complimentary manner ✓/A pairs with T and G pair with C / T=A; G=C
-Nitrogen bases bind with a hydrogen bond ✓

Any 6 (6)

(15)

2.2.

2.2.1 a. Cell membrane (1)

b. Centromere (1)

2.2.2. **Crossing over** ✓* (4)

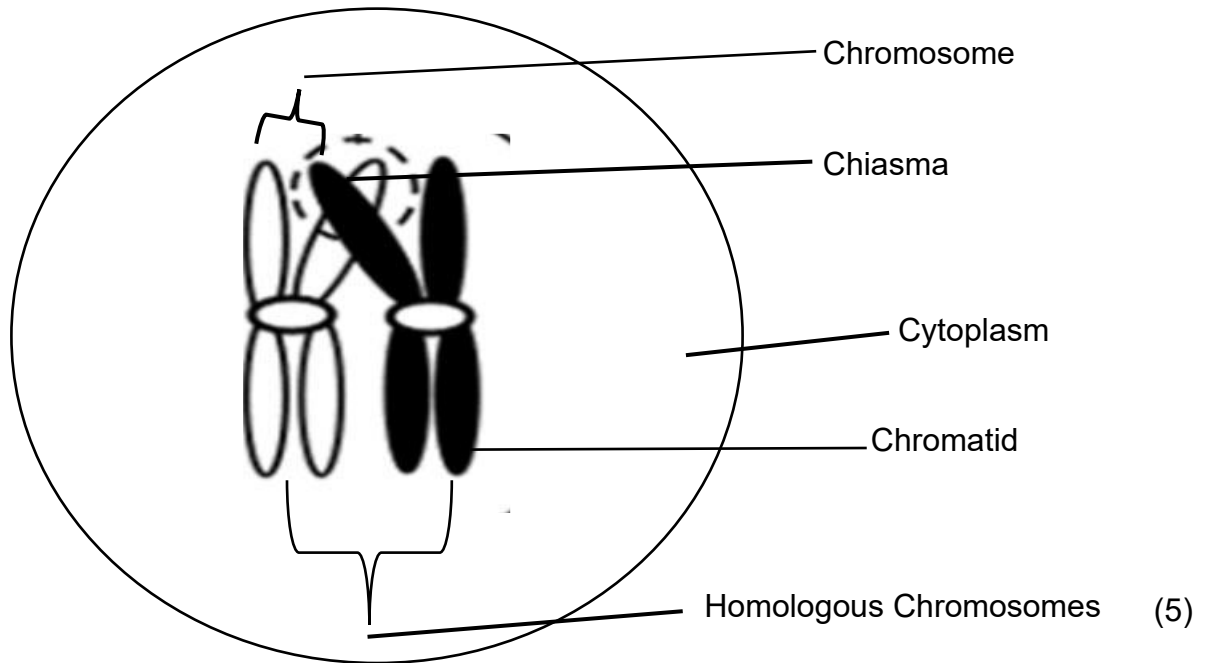
-Homologous chromosomes lie next to each other ✓
-Adjacent/non-sister chromatids of each chromosomes overlap✓.
-at points called chiasmata ✓
-and genetic material is exchanged ✓

2.2.3. -The gametes that form will be genetically different ✓/introduces genetic variation in gametes

- leading to variation in the offspring ✓/increasing the gene pool.
- It provides variation for natural selection to work on ✓/offspring are better adapted to a particular environment
- The species has a better chance of survival ✓

Any 3 (3)

2.2.4. **Diagram showing (how chromosomes appear during) crossing over (in Cell B)**



Criteria	Description	Marks
Caption (C)	Including "crossing over"	1
Correct drawing (D)	Drawing showing crossing over at one point ONLY.	1
Shading (S)	One chromosome shaded and one chromosome unshaded	1
Labels (L)	1 label correct	1
	ANY 2 labels correct	2

(14)

2.3.

- 2.3.1 2✓ /Two (1)
- 2.3.2. - Both alleles / I^A and I^B are equally dominant ✓ (2)
- whereby both alleles express themselves in the phenotype ✓ in the heterozygous condition
- 2.3.3. - The man has an allele for blood group A ✓/ is $I^A I^B$ (5)
- The woman is heterozygous ✓/ is $I^B i$ for blood group B
- The child inherits the I^A ✓/dominant allele from the father
- and the i ✓/recessive i from the mother
- Therefore, the child will be heterozygous ✓ for blood group A/the genotype will be $I^A i$ /the genotype I^A masks i (8)

2.4.

- 2.4.1 - Fannie has short fingers and straight hair ✓ (2)
- Rose has normal fingers and curly hair ✓
- 2.4.2. bH ✓, bh ✓ (If a learner wrote all the possible gametes, mark the first two only) (2)
- 2.4.3. Due to random arrangement of chromosomes at the equator ✓ during meiosis ✓ any one of the two alleles of a characteristic can sort with any one of another characteristic ✓
The alleles of different genes move independently ✓ of each other into the gametes ✓
They can therefore appear in the gametes in different combinations: BH , Bh , bH , bh ✓ (4)
(8)

2.5.

- Normal females have two X ✓ chromosomes
- Normal males have one X and one Y ✓
- The female always provides X in the egg ✓
- If an egg cell is fertilized by an X bearing sperm ✓ a female/girl ✓ is formed
- If an egg is fertilized by a Y bearing sperm ✓
- a male/boy ✓ is formed

(5)

: [50]

QUESTION 3

3.1.

3.1.1 a. (Exposure to) DDT ✓/insecticide (1)

b. Resistance of mosquitoes ✓ (1)

3.1.2. a. (2)

- Decide on the duration ✓ of the investigation
- Decide on the area ✓ to capture mosquitoes
- Decide on the sample size ✓
- Decide on date ✓/time of capturing mosquitoes
- Decide on the concentration of DDT ✓ used
- Decide how long the mosquitoes must be exposed to DDT ✓
- Decide how to record the results ✓/on the form to record the results
- Decide on type of mosquitoes ✓/species of mosquitoes
- Ask permission ✓ (from authorities/land-owner) to conduct the investigation
- Select apparatus ✓ to capture mosquitoes
- Train research assistants ✓

(Mark first TWO only)

Any 2

b.

- **Same** time (1 hour per day) ✓ for the duration of the investigation
- Same** laboratory conditions ✓ for the full period of the investigation
- Same** dose (4%) of DDT ✓ for the full period of the investigation
- All** mosquitos must be healthy ✓ for the full period of the investigation

(Mark first TWO only)

Any 2

c.

- Mosquitoes developed a resistance to DDT ✓✓/
resistance to DDT will increase over time

OR

- DDT is an not an effective insecticide to control the spread of mosquitoes ✓✓

(2)

(8)

3.2.

3.2.1 -The change in characteristics of a species ✓ (2)
-over time ✓

3.2.2. -Squirrels with sparse hair ✓ resulted in lower(cooler) body temperatures ✓
Good digging claws ✓ -enabled them to dig (make tunnels) in the deep/cool sand. ✓ (4)

3.2.3. -The original/ancestral **population** of the (ground) squirrels ✓ (8)
-became separated by the canyon ✓*/Grand Canyon/deep eroded Colorado River
-the population split into two ✓/divided into a north and south population
-the squirrels stopped crossing the canyon because there was no shelter ✓/shade/temperature too high/desert habitat
-there is no gene flow between the north and south population ✓/between the two squirrel populations
-In the south side it was warmer, with less shade ✓/the squirrels were exposed to heat
-in the north side it was cooler with more shade ✓/the squirrels were less exposed to heat/the exposure to heat differed
-in the north and south side natural selection occurs independently in each of the two populations ✓
-such that the individuals of the two populations **become different** ✓ from each other
-genotypically and phenotypically ✓
-even if the two populations were to mix again ✓
-they will not be able to interbreed ✓
-the two populations are the Abert and Kaibab squirrels ✓/are different species

*1 compulsory mark + Any 7

3.2.4. -Breeding at different times of the year ✓ ()
-Species-specific courtship behavior ✓
-Plant adaptation to different pollinators ✓
-Infertile offspring ✓
(Mark first TWO only) Any 2

(16)

- 3.3.
- There is a great deal of variation amongst the offspring ✓
 - Some have favourable characteristics and some do not ✓
 - There is a change in the environmental conditions ✓
 - Whilst organisms with unfavourable characteristics, which made them less suited, died ✓
 - Whilst organisms with favourable characteristics made them more suited, survived ✓ and
 - Reproduce(d) ✓
 - the allele for favourable characteristic is passed on to their offspring ✓
 - The next generation will therefore have a higher proportion of individuals with the favourable characteristics ✓

Any 7

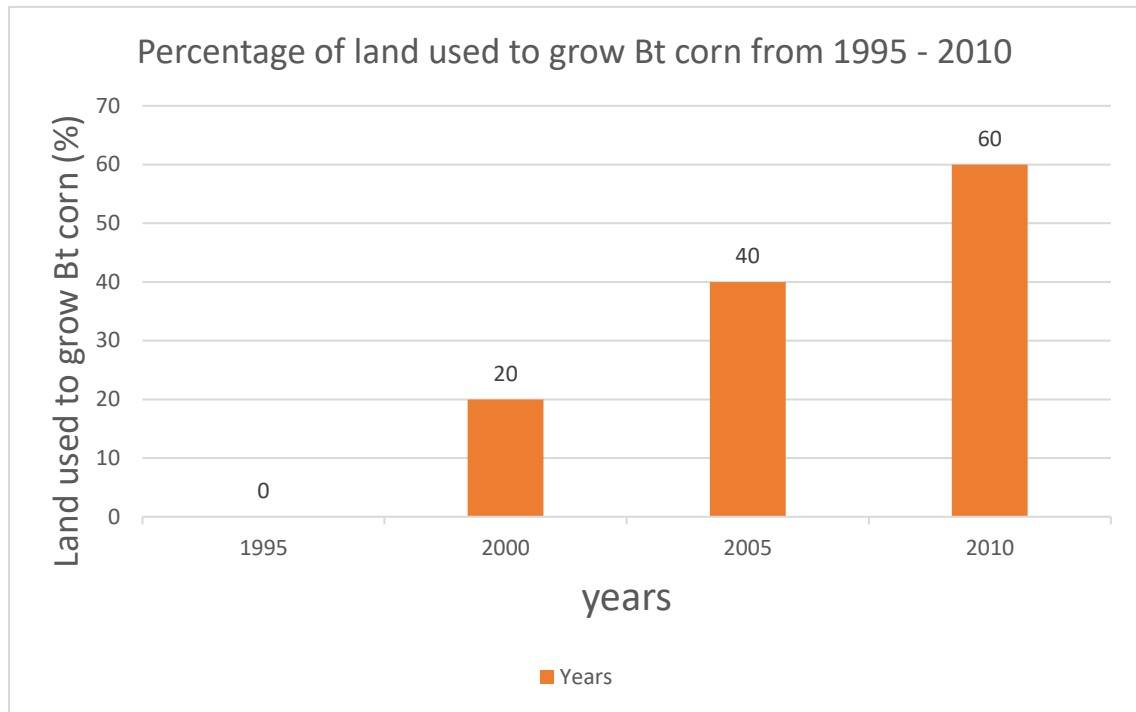
(7)

3.4.

- 3.4.1 -The gene for insect resistance is isolated from another species ✓
-and inserted into the DNA of corn ✓ where it is expressed (2)
- 3.4.2. As (the percentage of) land used to grow corn Bt corn increases the amount of insecticides used decreases ✓✓ (2)
- 3.4.3. -Longer shelf life✓
-Drought resistant ✓
-More nutrients ✓
-Frost resistant ✓
-Increased size ✓
-Increased crop yield ✓
-Herbicide resistant ✓
-No allergies ✓
-Heat tolerant ✓
-Disease resistant ✓

Any 2 (2)

3.4.4.



Criteria for marking the graph

Criteria	Mark allocation
Bar graph is drawn (T)	1
Caption of the graph includes both variables (C)	1
Correct labels on the Y-axis and X-axis with the correct units on the Y-axis (L)	1
Correct scale for the Y-axis and bars of equal width and spaces for X-axis (S)	1
Plotting (P) correctly done for:	
1-3 years	1
All 4 required years	2

(6)

(12)

3.5.

3.5.1

Skull A	Skull B
Rectangular/U-shaped palate ✓	Rounded/C-shaped palate ✓
Large canines/teeth ✓	Small canines/teeth ✓
Foramen magnum in a more backward position ✓	Foramen magnum in a more forward position ✓
Large jaw ✓	Small jaw ✓
prognathous✓// more protruding jaws	Non-prognathous ✓/less protruding jaws
More pronounced zygomatic arches ✓	Less pronounced zygomatic arches ✓
Gaps/diastema between the teeth ✓	No gaps/diastema between the teeth✓

(Mark first THREE only)**(3x2) +1 table****(7)****: [50]****TOTAL SECTION B: 100****GRAND TOTAL: 150**