education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES

SEPTEMBER 2025

MARKING GUIDELINES

MARKS: 150

These marking guidelines consists of 12 pages.

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PRINCIPLES RELATED TO MARKING LIFE SCIENCES

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 the answer, 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 provincial memo discussion meeting.

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14. **If only letter is asked for and only name is given (and vice versa)**
Do not credit.

15. **If units are not given in measurements**
Candidates will lose marks. The marking guideline 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 to the marking guideline**
No changes must be made to the marking guideline without consulting the Provincial Internal Moderator who in turn will consult with the Provincial Internal Moderator (and the External moderators where necessary)

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SECTION A

QUESTION 1

1.1	1.1.1		D✓✓		
	1.1.2		C✓✓		
	1.1.3		B✓✓		
	1.1.4		D✓✓		
	1.1.5		B✓✓		
	1.1.6		A✓✓		
	1.1.7		C✓✓		
	1.1.8		A✓✓		
	1.1.9		D✓✓	(9 x 2)	**(18)**
1.2	1.2.1		Nucleolus✓		
	1.2.2		Genome✓		
	1.2.3		Cytokinesis✓		
	1.2.4		Centriole ✓/Centrosome		
	1.2.5		*Australopithecus*✓		
	1.2.6		Stem cells✓		
	1.2.7		Continuous✓ variation		
	1.2.8		Species ✓		
	1.2.9		Homologous✓ structures		
	1.2.10		Peptide✓ bond	(10 x 1)	**(10)**
1.3	1.3.1		None ✓✓		
	1.3.2		A only ✓✓		
	1.3.3		B only ✓✓	(3 x 2)	**(6)**
1.4	1.4.1	(a)	Allele✓		(1)
		(b)	Monohybrid✓ cross		(1)
	1.4.2		Ovary✓/Ovule		(1)
	1.4.3	(a)	Violet ✓		(1)
		(b)	Wrinkled✓		(1)
	1.4.4		Law of dominance ✓✓		(2)
	1.4.5	(a)	9 : 3 : 3 : 1✓✓		(2)
		(b)	RrPp✓		(1)
					(10)

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1.5 1.5.1 Bone fragment✓ (1)

1.5.2 Yes✓ (1)

1.5.3 There are bands on the profile of B which correspond with those of the mother and those of son A✓✓ (2)

1.5.4 to:
- identify suspects of crimes✓
- prove paternity✓
- determine probability of causes of genetic disorder ✓
- to establish compatibility of tissues for organ transplants✓

(**Mark first TWO only)** Any (2)
(6)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 Ribosome✓ (1)

2.1.2 Aspartate✓ Serine✓ (2)

2.1.3 - GAC and GAU code for the same amino acid✓/aspartate
- therefore there will no effect on the formation of protein✓/same protein is formed. (2)

2.1.4 - Each tRNA carries a specific amino acid✓
- When the anticodon on the tRNA✓
- matches the codon on the mRNA✓
- then tRNA brings the required amino acid to the ribosome. ✓
- Amino acids become attached by peptide bonds✓
- to form the required protein✓ Any (5)

2.1.5 T✓

DNA Replication	Transcription
Two identical DNA molecules are formed✓	One mRNA molecule is formed✓
Two strands act as templates✓	One strand act as a template✓
Base pairs are formed✓	No base pairs formed✓
DNA nucleotides are used✓	RNA nucleotides are used✓

(Mark first TWO only) Table 1 + Any (2 x 2) (5)
(15)

2.2 2.2.1 Biogeography ✓ (1)

2.2.2 - Genetic evidence ✓
- Modification by descent✓/Homologous structures
- Fossil evidence✓ (3)

2.2.3 Speciation is formation of new species from the existing ones✓while Extinction is the complete disappearance of species from the Earth✓ (2)

2.2.4
- A population of baobab tree species (in Madagascar) becomes separated by a geographical barrier, the sea✓
- then the population splits into two sub-populations✓, in Africa and in Australia
- There is now no gene flow between the two populations✓.
- Since each population may be exposed to different environmental conditions✓/the selection pressure may be different
- natural selection occurs independently in each of the two populations✓
- such that the individuals of the two populations become very 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 now two different species, in Africa and in Australia✓ Any (6)

(12)

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2.3 2.3.1 (a) **A** Homologous chromosome✓ (1)

(b) **B** Spindle fibre✓ (1)

2.3.2 Metaphase I✓ (1)

2.3.3
- Double stranded chromosomes become visible ✓
- the centrosome duplicates/divides into centrioles which will move to opposite poles✓
- spindle fibres are formed✓
- and attach to the centromere✓/holds chromosomes
- Crossing over occur

Any (4)

2.3.4
- The exchange of genetic material✓ in crossing over
- Results formation of genetically different gametes✓
- leading to increase in genetic variation among the offspring✓
- where some will have favourable characteristics✓,
- and others to have unfavourable characteristics✓
- When the environmental conditions change✓/when there is
- competition/selection pressures
- those with favourable characteristics will survive✓
- and those with unfavourable characteristics will die ✓

Any (5)

2.3.5 23✓ chromosomes (1)

2.3.6
- Non disjunction occurred✓ at pair 21/chromosomes/chromatids at pair 21 failed to separate✓
- during anaphase✓

Any (2)

(15)

2.4 2.4.1 (a) Woman/female with X-linked Alport syndrome✓✓ (2)

(b) X^AY✓✓ (2)

2.4.2 3✓ (1)

2.4.3 Heterozygous✓ (1)

2.4.4
- She and Abe, a male with X^aY genotype✓/ with X-linked Alport syndrome,
- have sons with X^AY genotype✓/without the condition
- and a daughter with X^aX^a genotype✓/with the condition

Any (2)

(8)

[50]

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QUESTION 3

3.1 3.1.1 To determine the effect of Bt-gene on the yield of cotton plants ✓✓ (2)

3.1.2 (a) (Varieties/type) of cotton plants✓ (1)

(b) Yield✓ of cotton plants (1)

3.1.3
- Equal number of the two varieties of cotton plants were planted in each plot✓
- The environmental conditions for the two plots were exactly the same✓
- Insects of the same type were introduced in each plot✓
- Equal number of/500 insects were introduced in each plot✓ Any (1)

3.1.4 To increase the reliability of the results.✓ (1)

3.1.5 The cotton plants with the Bt-gene have more yield. ✓✓ (2)
(8)

3.2 3.2.1 (a) (Skull) **A**✓ (1)

(b) (Pelvis) **I**✓ (1)

3.2.2 The pelvis is short✓ and wide✓ (2)

3.2.3
- Large cranium✓
- houses a large brain✓
- leading to more intelligence✓ Any (2)

3.2.4 the foramen magnum move from a backward position✓ in quadrapedalism to a more forward position✓ in bipedalism (2)

3.2.5 Species D have small/short canines✓, since they feed on soft/cooked food✓
Species E have large/long and pointed/sharp canines✓ to it to be able to tear✓ raw/uncooked food✓ Any (4)

3.2.6 C–shaped ✓ (1)
(13)

3.3 3.3.1 Phylogenetic tree✓ (1)

3.3.2 *Australopethicus anamensis*✓ (1)

3.3.3 (a) 3✓ (1)

(b) 6✓ (1)

3.3.4 3✓ million years ago✓/mya (2)

3.3.5 They share the most recent common ancestor, *Paranthropus aethiopicus*✓✓ (2)

3.3.6 (a) *Australopethicus afarensis*✓ (1)

(b) *Homo erectus*✓ (1)

3.3.7
- Fossils of *Homo habilis* are found in Africa only✓
- The oldest fossils of *Homo erectus* are found in Africa✓ while younger fossils *a*re found in other parts of the world✓
- The oldest fossils of *Homo sapien* are found in Africa✓ while younger fossils *a*re found in other parts of the world✓ Any (3)

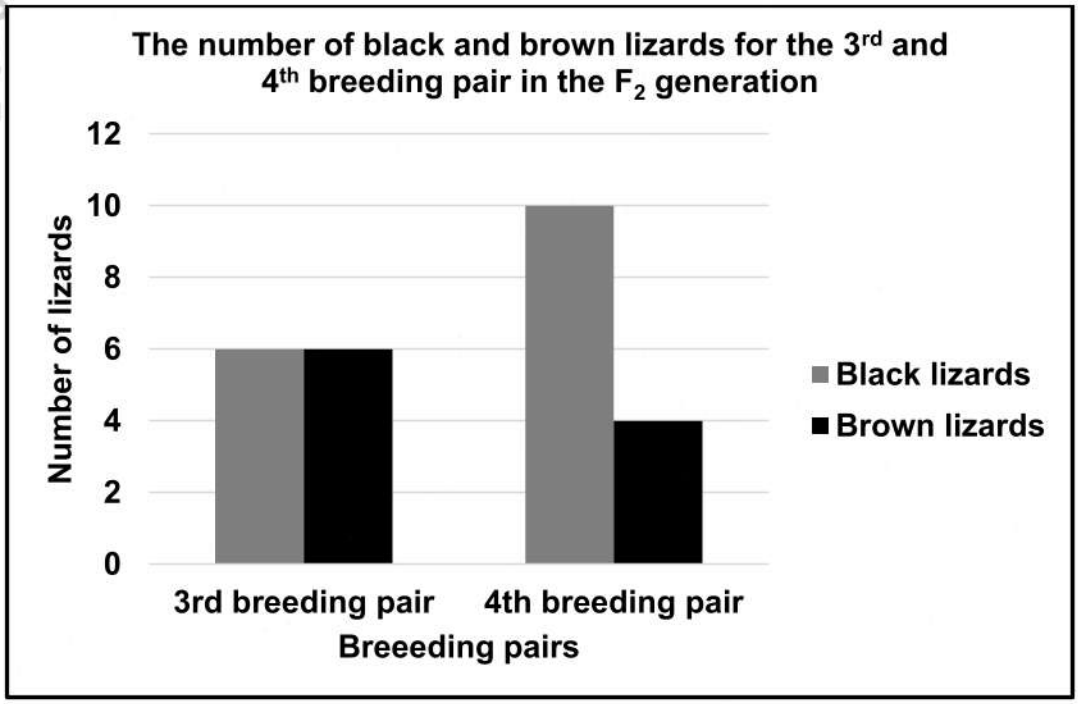
(13)

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3.4 3.4.1 (12+9+6+12) : (0+3+6+4) ✓ =39 :13 / 3:1✓ (2)

3.4.2 - The parents in the P_1 generation, one with black skin and another with brown skin ✓/homozygous with contrasting characteristics
- but all the offspring they produced in the F_1 generation have black skin✓ (2)

3.4.3



Guideline for assessing the graph

CRITERIA		ELABORATION	MARK
Correct type of graph	**(T)**	Bar graph drawn	1
Caption of graph	**(C)**	Both variables, skin colour and breeding pairs	1
Axes labels	**(L)**	X-and Y axis correctly labelled with units	1
Scale for X- and Y-axis	**(S)**	- Equal width and spaces of bars - Correct scale for Y-axis	1
Plotting of co-ordinates	**(P)**	- 1 to 3 bars plotted correctly - All 4 bars plotted correctly	1 2

(6)
(10)

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3.5 **P_1** Phenotype: Man with blood group A x Woman with blood group B✓

Genotype: I^Ai x I^Bi ✓

Meiosis

Gametes: I^A i x I^B i ✓

Fertilization

F_1

Genotype: I^AI^B I^Ai I^Bi ii ✓

Phenotype: Blood Group AB | Blood Group A | Blood group B | Blood Group O ✓

All blood groups✓* were possible in F_1 generation

P_1 and F_1✓

Meiosis and fertilisation✓

***1 compulsory mark +** Any 5

OR

P_1 Phenotype: Man with blood group A x Woman with blood group B✓

Genotype: I^Ai x I^Bi✓

Meiosis

Fertilization

Gametes	I^A	i
I^B	I^AI^B	I^Bi
i	I^Ai	ii
1 mark for correct gametes 1 mark for correct genotypes		

F_1 Phenotype: Blood Group AB | Blood Group A | Blood group B | Blood Group O ✓

All blood group✓* were possible in F_1 generation

P_1 and F_1✓

Meiosis and fertilisation✓

***1 compulsory mark +** Any 5 **(6)**

[50]

TOTAL SECTION B: 100

GRAND TOTAL: 150

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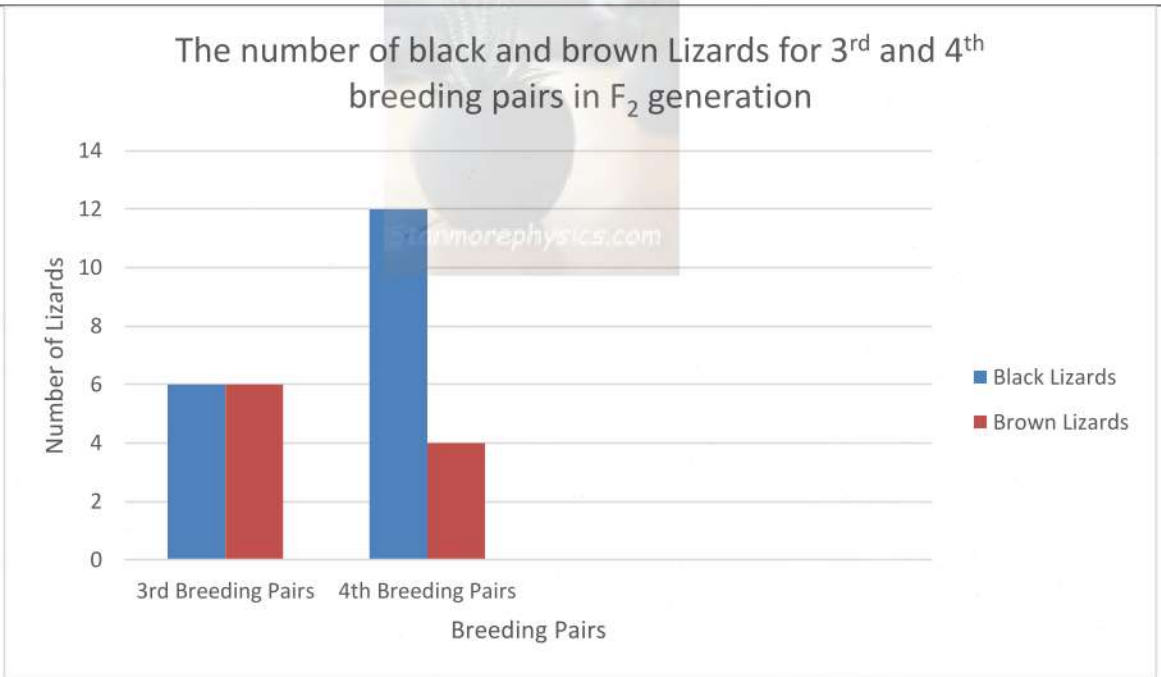
education
Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

Inset Building, Dr Albert Luthuli Drive
Private Bag X2044
Mmabatho 2735
Tel.: (018) 384-5805
e-mail: KJamolo@nwpg.gov.za

Chief Directorate: Examinations and Assessment
Directorate: Assessment

SUBJECT	LIFE SCIENCES	PAPER	2
DATE	22 September 2025	TIME OF ERRATA	
QUESTION		MARKS	
QUESTION		MARKS	
QUESTION		MARKS	
QUESTION		MARKS	
	TOTAL MARKS AFFECTED		
	TOTAL MARKS FOR THE PAPER AFTER ADJUSTMENT		0

NUMBER	SUB QUESTION	CORRECTIONS/ADDITIONS/ADJUSTMENT	MARKS
1	1.1.8	Correct Answer is **C not A**	(2)
2	1.3.2	Correct Answer is **B only not A only**	(2)
3	1.5.3	Rephrase: There are **DNA** bands/**pattern** on the profile of B which correspond with those of the mother✓ and those of son A✓(split ticks)	(2)
	2.1.5	**DNA Replication** / **Transcription** The whole molecule unwind and unzip✓ / A small portion of molecule unwinds and unzip✓ Thymine pairs with adenine✓ / Adenine pairs with uracil✓	(5)
	2.2.2	- Genetic✓ evidence - Modification by descent✓/Homologous structures - Fossil✓ evidence/**records**	(3)
	2.2.3	Speciation is formation of new species✓from the existing/original (move tick)	(1)
	2.2.4	- A population of baobab tree species (in Madagascar) becomes separated by a geographical barrier, the sea✓/ ocean/continental drift - then the population splits into two✓ sub-populations/population, in Africa and in Australia - There is now no gene flow between the two populations✓. - Since each population may be exposed to different environmental conditions✓/the selection pressure may be different - natural selection occurred independently in each of the two populations✓ - such that the individuals of the two populations become very different✓ from each other - genotypically and phenotypically✓. - Even if the two populations were to mix again✓/cross pollinate they will not be able to interbreed✓. (don't accept reproduce) - The two populations are now two different species✓, in Africa and in Australia. Any	(6)
	2.3.3	- Double stranded chromosomes become visible ✓ - the nucleolus✓ and nuclear membrane disappears✓ - the centrosome duplicates/divides into centrioles which will move to opposite poles✓	

		- spindle fibres are formed✓ - and attach to the centromere✓/holds chromosomes Crossing over occur✓ Any	(4)
	2.3.6	- Non disjunction occurred✓ at pair 21 - chromosomes/chromatids at position 21 failed to separate✓ - during anaphase✓/ I /II Any	(2)
	2.4.4	- She and Abe, a male with X^aY genotype✓/ with X-linked Alport syndrome, - have sons with X^AY genotype✓/without X-linked Alport syndrome - and a daughter with X^aX^a genotype✓/ with X-linked Alport syndrome Any	(2)
3	3.1.2	(a) **Presence and absence of Bt-gene✓ NOT Varieties of cotton plants**	(1)
	3.1.3	- Equal number of the two varieties of cotton plants✓ were planted in each plot - Equal number of /500 insects✓ were introduced in each plot - **Equal planting fields✓** - Same type of insects✓ - Same environmental conditions for the two plots✓ Any	(1)
	3.4.3		(6)
		Note: If a histogram or line graph is drawn instead of a bar graph, marks will be lost for: • Type of graph (T) • Scale (S) If axes are transposed: • learner can get all marks if labels are **also swapped and bars are of equal width and spaces are equal** • Learner will loose marks for label and scale **: if labels are swapped or not corresponding.**	

		• **But bars can be credited if 1 to 3 or ALL are correct** Bars may **not attched together** but must **be close to each** other per breeding pair.	