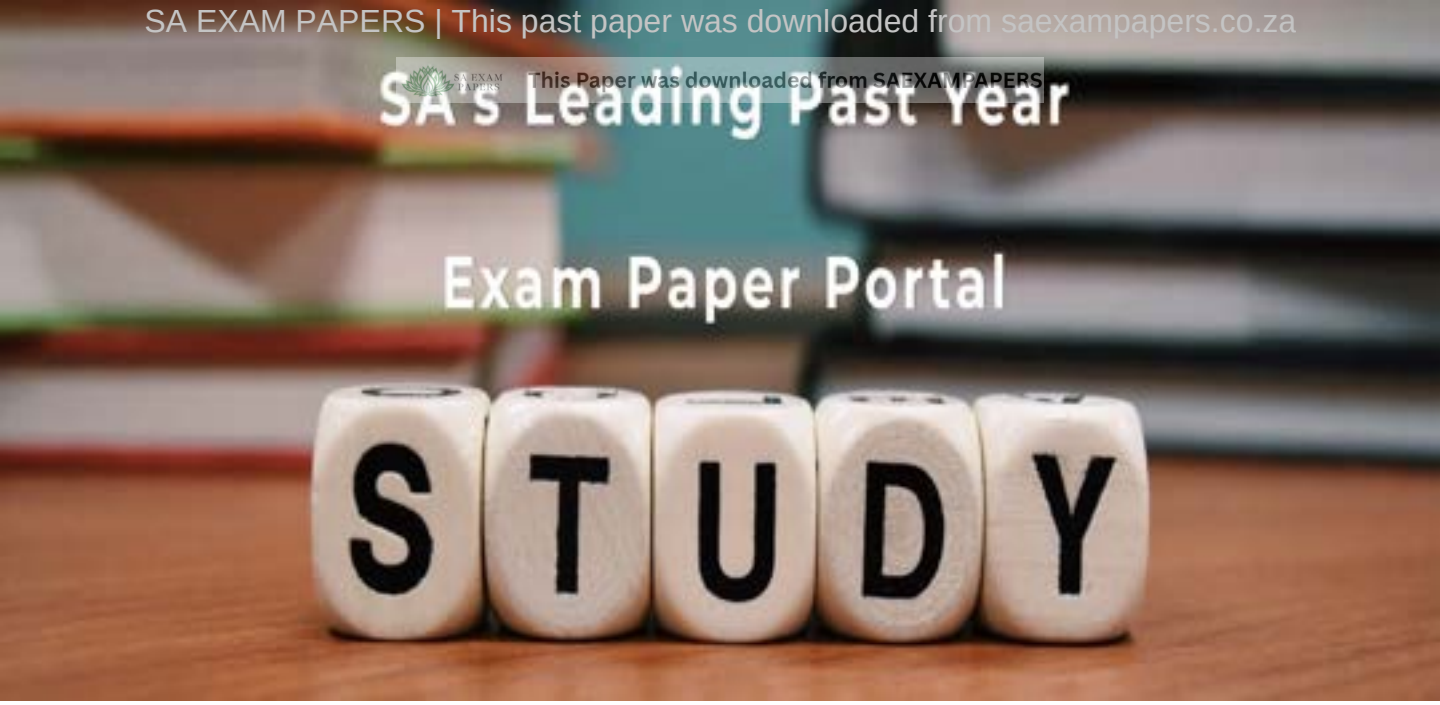


education

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.

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.

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)

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)

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)

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]**

QUESTION 3

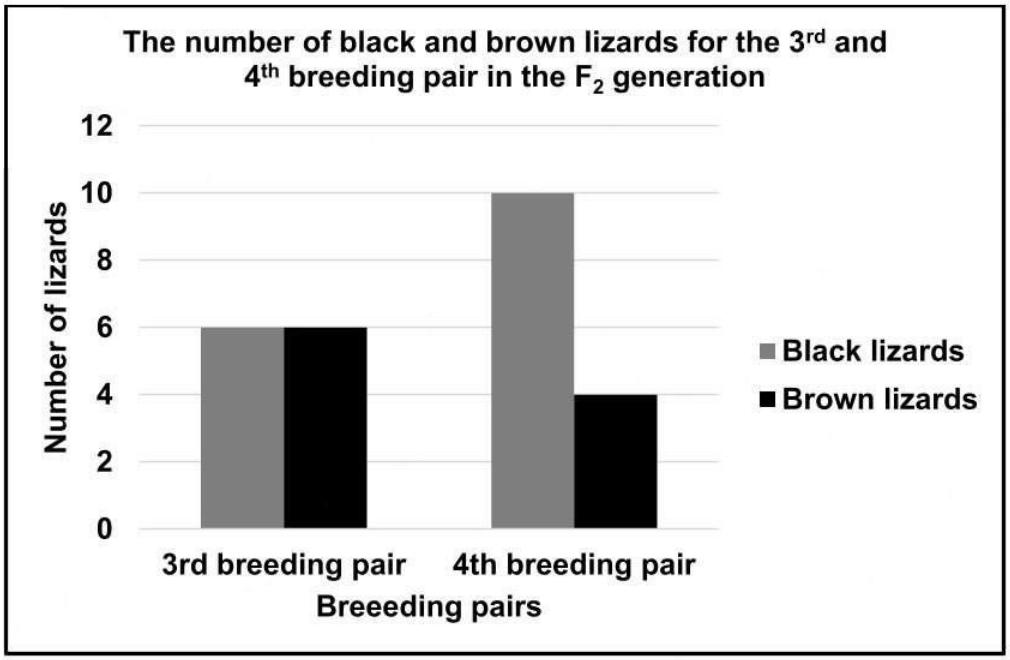
3.1	3.1.1	To determine the effect of Bt-gene on the yield of cotton plants ✓✓		(2)
	3.1.2	(a) (Varieties/type) of cotton plants✓		(1)
		(b) Yield✓ of cotton plants		(1)
	3.1.3	- Equal number of the two varieties of cotton plants were planted in each plot✓ - The environmental conditions for the two plots 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 are found in other parts of the world✓ - The oldest fossils of *Homo sapien* are found in Africa✓ while younger fossils are found in other parts of the world✓ Any	(3)
			(13)

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)

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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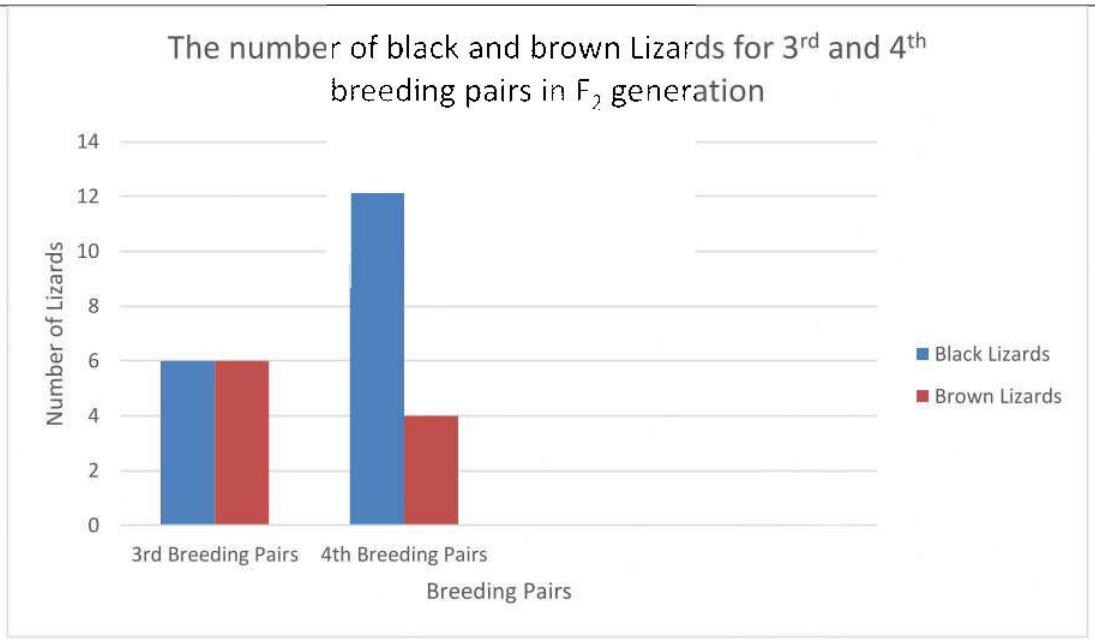
hief Directorate: Examinations and Assessment
Directorate: Assessment

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 two✓ 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.	