basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES P2

NOVEMBER 2025

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 9 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 a part of it is required**
   Read all and credit the relevant part.

4. **If comparisons are asked for, but descriptions are given**
   Accept if the 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 the 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 are given in terminology**
    Accept, provided it was accepted at the national standardisation meeting.

14. **If only the letter is asked for, but only the 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 learner's 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 guidelines. The provincial internal moderator must be consulted, who in turn will consult with the national internal moderator (and the Umalusi moderators where necessary).

20. **Official marking guidelines**
Only marking guidelines bearing the signatures of the national internal moderator and the Umalusi moderators and distributed by the National Department of Basic Education via the provinces must be used.

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SECTION A

QUESTION 1

1.1	1.1.1	B✓✓		
	1.1.2	A✓✓		
	1.1.3	C✓✓		
	1.1.4	B✓✓		
	1.1.5	C✓✓		
	1.1.6	A✓✓		
	1.1.7	B✓✓		
	1.1.8	B✓✓		
	1.1.9	A✓✓		
	1.1.10	C✓✓	(10 x 2)	**(20)**
1.2	1.2.1	Peptide✓ bond		
	1.2.2	Mitochondrion✓		
	1.2.3	Stem cells✓		
	1.2.4	(Gene) mutation✓		
	1.2.5	Double helix✓		
	1.2.6	Extinction✓		
	1.2.7	Continuous✓variation		
	1.2.8	Dominant✓ allele		
	1.2.9	Locus✓	(9 x 1)	**(9)**
1.3	1.3.1	Both A and B✓✓		
	1.3.2	B only✓✓		
	1.3.3	B only ✓✓	(3 x 2)	**(6)**
1.4	1.4.1	(a) Cell membrane✓		(1)
		(b) Spindle fibre✓		(1)
		(c) Centriole✓/centrosome		(1)
	1.4.2	(a) W✓		(1)
		(b) Y✓		(1)
		(c) V✓		(1)
	1.4.3	(a) 6✓		(1)
		(b) 3✓		(1)
				(8)
1.5	1.5.1	(a) Translation✓		(1)
		(b) tRNA✓/transfer RNA		(1)
		(c) Ribosome✓		(1)
	1.5.2	(a) CGT✓		(1)
		(b) CTA✓✓		(2)
	1.5.3	P✓		(1)
				(7)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1	2.1.1	Centromere✓	(1)
	2.1.2	Gonosomes✓	(1)
	2.1.3	There will be one X-chromosome and one Y-chromosome✓	(1)
	2.1.4	(a) Crossing over✓	(1)
		(b) Prophase I✓	(1)
		(c) Leads to (increased) genetic variation✓ **(Mark first ONE only)**	(1)
	2.1.5	- They will appear as chromatids✓ - due to the splitting of the centromere✓/the chromosome separating **OR** - Each chromosome will have some genetic material of the other chromosome✓ - because of crossing over✓	(2)
	2.1.6	- The zygote will have XXY chromosomes✓/XXX chromosomes/an extra gonosome - since the ovum with XX chromosomes✓ - fused with a sperm with a Y-chromosome✓/X-chromosome	(3) **(11)**
2.2	2.2.1	DNA profiling✓	(1)
	2.2.2	(Suspect) 1✓ **(Mark first ONE only)**	(1)
	2.2.3	The DNA profile/bands of suspect 1 is/are identical to the DNA profile of the sample from the crime scene✓ **(Mark first ONE only)**	(1)
	2.2.4	- Evidence could have been planted at the crime scene✓ - Suspect could have been at the crime scene before the crime was committed✓ - Human error might occur during the procedure✓ - Manipulation of results can occur✓ - Contamination of the DNA sample✓ - DNA sample too small✓ - Suspect may have an identical twin✓ **(Mark first TWO only)**	Any (2)

2.2.5
- The DNA profiles of the child, mother and possible father are compared✓ since
- the child inherits 50% of their DNA from each parent✓
- All the DNA bands that are identical to the mother in the child's DNA profile are eliminated✓
- The remaining DNA bands are checked against the possible fathers'✓
- for possible matches with the child✓ Any (4)

(9)

2.3 2.3.1 Pedigree✓diagram (1)

2.3.2 1✓/One (1)

2.3.3 (a) Female with CADASIL✓ (1)

(b) dd✓ (1)

2.3.4
- Both individual 1 and 2 have CADASIL✓
- indicating they have a dominant allele✓/the (genotype) Dd
- but have children who do not have CADASIL✓/are homozygous recessive
- indicating that they inherited a recessive allele from each parent✓ (4)

2.3.5 50✓% (1)

(9)

2.4 2.4.1 (a) (Blood group) O✓ (1)

(b) (Blood group) A✓ (1)

2.4.2
- I^BI^B✓
- I^Bi✓ (2)

(Mark first TWO only)

2.4.3 (Blood group) B✓✓ (2)

2.4.4
- Allele I^A / allele for blood group A is inherited from one parent✓and
- allele I^B/ the allele for blood group B from the other parent✓
- the alleles are co-dominant✓ /equally dominant and are
- equally expressed in the phenotype✓ /the child will have the genotype I^AI^B Any (3)

(9)

2.5 2.5.1 Incomplete✓ dominance (1)

2.5.2
- Neither the allele of a cream-coloured coat and chestnut-coloured coat is dominant✓
- resulting in the intermediate phenotype which is the golden-coloured coat✓/palomino (2)

2.5.3 (a) Artificial selection✓/selective breeding (1)

(b)
- Chestnut (coloured) coat✓
- Cream (coloured) coat✓ (2)

(Mark first TWO only)

2.5.4

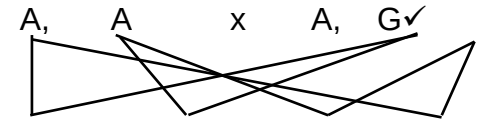
P_1 Phenotype: Cream-coloured (coat) x Palomino✓/ golden coloured (coat)

Genotype: AA x AG✓

Meiosis

Gametes: A, A x A, G✓

Fertilisation



F_1 Genotype: AA, AA, AG, AG✓

Phenotype: Cream-coloured , palomino✓/golden-coloured

1: 1 ✓*** (phenotypes must be correct)**

P_1 and F_1✓
Meiosis and fertilisation✓

***1 compulsory mark** + Any 5

OR

P_1 Phenotype: Cream-coloured x Palomino✓/ golden coloured

Genotype: AA x AG✓

Meiosis

Fertilisation

Gametes	A	A
A	AA	AA
G	AG	AG

1 mark for correct gametes
1 mark for correct genotypes

F_1 Phenotype: Cream-coloured, palomino✓/ golden-coloured

1: 1✓*** (phenotypes must be correct)**

P_1 and F_1✓
Meiosis and fertilisation✓

***1 compulsory mark** + Any 5

(6)
(12)
[50]

QUESTION 3

3.1 3.1.1
- Eyes in front✓
- Binocular vision✓
- Stereoscopic vision✓
- Colour vision✓/ presence of cones

Any (2)

(Mark first TWO only)

3.1.2
- Smaller jaws in humans✓ and larger jaws in African apes✓
- Small teeth/canines in humans✓ and large teeth/canines in African apes✓
- C-shaped palate in humans✓ and a U-shaped palate in African apes✓
- Humans are non-prognathous✓ and African apes are prognathous✓
- Humans do not have diastema✓ and African apes have diastema✓
- There is a well-developed chin in humans✓ and an underdeveloped chin in African apes✓

(Mark first TWO only) Any (2 x 2) (4)

3.1.3
- The foramen magnum is in a more forward position✓ to allow the vertebral column to attach below it✓
- The spine is S-shaped✓ for better distribution of upper body weight✓/to absorb shock when walking upright/to allow flexibility
- The pelvis is short and wide✓ to support the weight above the pelvis✓/upper body (6)

(12)

3.2 3.2.1 3✓/Three (1)

3.2.2
- Taung child✓
- Mrs Ples✓
- Little foot✓

Any (2)

(Mark first TWO only)

3.2.3 609✓ mℓ (1)

3.2.4 $= \frac{1330-609}{609}$ ✓x 100✓

= 118,39✓% (3)

3.2.5
- The cranium remains✓/becomes fossilised
- The cranium houses the brain✓, therefore
- measuring the cranial capacity✓ gives brain volume (3)

3.2.6
- Brain volume increased✓
- leading to more intelligence✓ and
- the development of (complex) tools✓ (3)

(13)

3.3 3.3.1 (a)
- A group of organisms with similar characteristics✓
- that can interbreed to produce fertile offspring✓ (2)

(b)
- They breed at different times of the year✓/ostriches lay their eggs mainly in September while emus lay their eggs from November to April
- therefore, they cannot interbreed✓ (2)

(c)
- Species-specific courtship behaviour✓
- Infertile offspring✓
- Prevention of fertilisation✓ (2)

(Mark first TWO only)

3.3.2 Biogeography✓ (1)

3.3.3
- The ratites all had one common ancestor✓
- When continental drift✓ occurred
- the (population) of ratites was separated✓
- The sub-populations were faced with different environmental conditions✓ and
- underwent natural selection independently✓
- to form different species✓ Any (5)

(12)

3.4 3.4.1 Availability of food✓ (1)

3.4.2 They measured the time it took for 80% of the flies to die from starvation✓ (1)

3.4.3 Age✓ (1)

(Mark first ONE only)

3.4.4
- To improve the validity✓ of the investigation
- by ensuring that the availability of food is the only independent variable✓
- so that any changes that occur are only due to food availability ✓ of food Any (2)

3.4.5
- The hours until death in the 1st generation was shorter✓/ between 8 and 40✓ hours
- The hours until death in the 60th generation was longer✓/ between 140 and 180✓ hours (2)

3.4.6
- There was variation in the population of fruit flies✓
- Some were starvation resistant while some were not starvation resistant✓
- When the food source was removed✓
- the fruit flies that were not starvation resistant died✓
- Those that were starvation resistant survived and reproduced✓and
- passed on the allele for starvation resistance to their offspring✓
- The next generation had a higher proportion of fruit flies that were starvation resistant✓ Any (6)

(13)

[50]

TOTAL SECTION B: 100

GRAND TOTAL: 150

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