basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

LIFE SCIENCES P2

MAY/JUNE 2025

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 9 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 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 non-recognised 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.

SECTION A

QUESTION 1

1.1	1.1.1	A✓✓		
	1.1.2	D✓✓		
	1.1.3	D✓✓		
	1.1.4	C✓✓		
	1.1.5	C✓✓		
	1.1.6	A✓✓		
	1.1.7	B✓✓		
	1.1.8	C✓✓		
	1.1.9	D✓✓	(9 x 2)	**(18)**
1.2	1.2.1	Alleles✓		
	1.2.2	Chloroplast✓		
	1.2.3	Phylogenetic tree✓ /Cladogram		
	1.2.4	Recessive✓ allele		
	1.2.5	Extinction✓		
	1.2.6	Artificial selection✓/Selective breeding		
	1.2.7	Haemophilia✓		
	1.2.8	Population✓		
	1.2.9	Autosomes✓		
	1.2.10	Karyotype✓/karyogram	(10 x 1)	**(10)**
1.3	1.3.1	B only✓✓		
	1.3.2	Both A and B✓✓		
	1.3.3	None✓✓	(3 x 2)	**(6)**
1.4	1.4.1	(a) Transcription✓		(1)
		(b) DNA Replication✓		(1)
	1.4.2	mRNA✓		(1)
	1.4.3	(a) Double helix✓		(1)
		(b) Interphase✓		(1)
		(c) Uracil✓		(1)
	1.4.4	(a) Ribose✓sugar		(1)
		(b) Hydrogen✓bond		(1)
	1.4.5	4✓/Four		(1)
				(9)
	1.5.1	Plant height✓ Flower colour✓		(2)
	1.5.2	TTRr✓✓		(2)
	1.5.3	(a) TtRr✓		(1)
		(b) Tall plant, white flower✓✓		(2)
				(7)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1
- Ovaries✓
- Testes✓ Any (1)

(Mark first ONE only)

2.1.2 (a) Spindle fibre✓ (1)

(b) Centriole✓ /centrosome (1)

2.1.3 Anaphase I✓ (1)

2.1.4 4✓/four (1)

2.1.5
- In diagram 1 the centromeres split✓
- In diagram 2 the centromeres do not split✓

OR

- In diagram 1 only chromatids (daughter chromosomes) move to the opposite poles✓ /chromosomes separate
- In diagram 2 chromosomes move to the opposite poles✓ /(homologous) chromosome pairs separate

(Mark first ONE only) Any (1 x 2) (2)

2.1.6
- Adjacent (non-sister) chromatids of homologous chromosomes overlap✓
- at points called chiasmata✓ /chiasma
- There is an exchange of genetic material✓ (3)

(10)

2.2
- Failure of a homologous pair 21 /chromosome 21 to separate✓
- during Anaphase✓I /II
- leads to a gamete with 24 chromosomes✓ / an extra chromosome
- The fertilisation of this gamete with a normal gamete✓ /with 23 chromosomes
- results in a zygote with 47 chromosomes✓ /an extra chromosome /Trisomy 21 **(5)**

2.3 2.3.1 (a) Translation✓ (1)

(b) Ribosome✓ (1)

2.3.2
- Transfers amino acids✓ to the ribosome
- according to the (mRNA) codon✓ (2)

2.3.3 (a) GUA✓ (1)

(b) CAT✓ (1)

2.3.4
- The sequence of bases on a DNA molecule changes✓
- from CCT to CGT✓ /second base in DNA triplet changed from C to G
- The codon GGA changed to GCA✓
- The tRNA molecule with the anticodon CCU✓
- is now replaced by a tRNA molecule with the anticodon CGU✓
- The sequence of amino acids changes✓ and
- a different protein is formed✓ (7)

(13)

2.4 2.4.1 - Both alleles for black feathers and white feathers✓
- are equally dominant✓ /expressed in the phenotype of the erminette chicken (2)

2.4.2 (Blood group) AB✓ (1)

2.4.3

P_1	Phenotype	White	x	Erminette✓
	Genotype	WW	x	BW✓
Meiosis				
	G/gametes	W, W	x	B, W✓
Fertilisation				
F_1	Genotype	BW , WW , BW , WW✓		
	Phenotype	Erminette, white✓*		

P_1 and F_1✓
Meiosis and fertilisation✓

***1 compulsory mark** + any 5

OR

P_1	Phenotype	White	x	Erminette✓
	Genotype	WW	x	BW✓

Meiosis

Fertilisation

Gametes	W	W
B	BW	BW
W	WW	WW

1 mark for correct gametes
1 mark for correct genotypes

F_1 Phenotype Erminette, white✓*

P_1 and F_1✓
Meiosis and fertilisation✓

***1 compulsory mark** + Any 5 (6)
(9)

2.5 2.5.1 (a) Pedigree✓diagram (1)

(b) Y✓chromosome (1)

2.5.2 - Low levels of phosphate✓
- can cause rickets✓ (2)

(Mark first TWO only)

2.5.3 3✓/Three (1)

2.5.4 (a) X^hY✓ (1)

(b) X^HX^h✓ (1)

2.5.5 - Individual 1 is a male with hypophosphatemia✓
- and has the genotype X^HY✓
- The daughters inherit the dominant allele/X^H from their father✓
- Individual 2 is a female who does not have hypophosphatemia✓
- and has the genotype X^hX^h✓
- The daughters inherit one recessive allele/X^h from their mother✓
- The X^h from the mother/individual 2 is masked by the X^H from the father✓/ all daughters will have X^HX^h genotype Any (6)

(13)
[50]

QUESTION 3

3.1 3.1.1 Animals:
- The nucleus is removed from an ovum✓
- The nucleus of a donor somatic cell is removed✓
- and inserted into the ovum✓
- Electric shock is used to activate mitosis✓
- An embryo develops✓
- and is implanted into the surrogate mother✓ Any 5

OR

Plants:
- A plant with the desired characteristics is selected✓
- A vegetative part of the 'parent' plant structure is removed✓
- and placed inside a growth medium✓
- to supply nutrients✓ /hormones
- to stimulate growth✓ (5)

3.1.2
- (Exact copies) of the most productive livestock✓ are made
- (Exact copies) of animals with desired characteristics✓ are made
- Conservation of endangered species✓
- Replacement of damaged tissues/organs✓ Any (3)

(Mark first THREE only) **(8)**

3.2
- All stickleback fish had spikey fins✓ originally
- In the lakes there were less /no predators✓
- The fish did not use the spikey fins anymore✓ /they used their fins less and their spikes disappeared✓
- The acquired characteristic of no spikes was then passed on to the next generation✓
- Eventually all the fish had no spikes✓ Any **(5)**

3.3 3.3.1

Skull A	Skull B
Rectangular /U-shaped palate✓	Rounded /C- shaped / semi-circular /parabolic 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) (3 x 2) + 1 table (7)

3.3.2 It is short and wide✓✓ (2)

(9)

3.4 3.4.1 (By) mosquitoes✓ (1)

3.4.2 (a) Use of antimalarial drugs✓ (1)
(b) Drug resistance✓ (1)

3.4.3 $\frac{551}{1\,485}$✓ x 100✓ = 37,1✓% (3)

3.4.4 (a)
- Blood samples only collected from people taking the anti-malarial drug✓
- The same affected area of collection✓ of blood samples
- The same villages✓ were used for the investigation
- The same laboratory✓/environmental conditions where samples were kept

(Mark first TWO only) Any (2)

(b)
- Repeated three times✓
- Done in seven villages✓
- Duration over a year✓
- A sample of 1 485 was collected✓ (2)

(Mark first TWO only)

3.4.5
- There was variation in the malaria parasite population✓
- Some parasites were resistant to the antimalarial drugs✓ and
- others were not✓
- When parasites were exposed to the antimalarial drugs✓
- Those that were not drug resistant did not survive✓/died
- Those that were resistant to the drugs survived✓ and
- reproduced✓ and
- passed the allele for drug resistance to their offspring✓
- The next generation had a higher proportion of parasites with drug resistance✓ Any (7)

(17)

3.5.1 2✓/ Two (1)

3.5.2 2 mya✓ (1)

3.5.3
- Mrs Ples✓
- Taung child✓
- Little foot✓ Any (2)

(Mark first TWO only)

3.5.4
- (Fossils of) *A. africanus* were found in Africa only✓
- (Fossils of) *H. habilis* were found in Africa only✓
- Oldest fossils of *H. erectus / H. sapiens* were found in Africa✓
- while the younger fossils were found in other parts of the world✓ (4)

3.5.5
- *H. sapiens* have a bigger brain volume than *H. habilis*✓, therefore
- *H. sapiens* are more intelligent than *H. habilis*✓
- Leading to *H. sapiens* developing more complex tools✓/ *H. sapiens* made more specialised tools (3)

(11)
[50]

TOTAL SECTION B: 100
GRAND TOTAL: 150