

FINAL



KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

**PROVINCIAL STANDARDISED
ASSESSMENT**

GRADE 12

LIFE SCIENCES P2

PREPARATORY EXAMINATION

SEPTEMBER 2026

MARKING GUIDELINE

MARKS: 150

TIME: 2½ hour

This marking guideline consists of 11 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES SEPTEMBER 2025

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 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.

SECTION A**QUESTION 1**

1.1	1.1.1	C✓✓/D		
	1.1.2	C✓✓		
	1.1.3	B✓✓		
	1.1.4	C✓✓		
	1.1.5	C✓✓		
	1.1.6	C✓✓		
	1.1.7	B✓✓		
	1.1.8	D✓✓		
	1.1.9	C✓✓		
	1.1.10	B✓✓		
			(10 x 2)	(20)
1.2	1.2.1	DNA replication✓		
	1.2.2	Karyotype ✓		
	1.2.3	Genome✓		
	1.2.4	Monohybrid✓		
	1.2.5	Gonosome✓		
	1.2.6	Haemophilia✓		
	1.2.7	Artificial selection✓/selective breeding		
	1.2.8	Phenotype✓		
	1.2.9	Speciation✓	(9 x 1)	(9)
1.3	1.3.1	A only✓✓		
	1.3.2	B only✓✓		
	1.3.3	Both A and B✓✓		
			(3 x 2)	(6)
1.4	1.4.1	(a) Cell membrane✓		(1)
		(b) Chromosome✓		(1)
		(c) Centrosome✓/centriole		(1)
		(d) Chromatid✓		(1)
	1.4.2	(a) Anaphase 1✓		(1)
		(b) Prophase 2✓		(1)
		(c) Crossing over✓		(1)
	1.4.3	(a) 8✓		(1)
		(b) 16✓		(1)
				(9)

1.5	1.5.1	Dihybrid✓cross	(1)
	1.5.2	(a) Complete ✓dominance	(1)
		(b) Law of segregation✓/Law of independent assortment	(1)
	1.5.3	(a) Round, yellow seeds✓	(1)
		(b) Ry ✓	(1)
		(c) $RrYY$ ✓	(1)
			(6)

TOTAL SECTION A: 50

SECTION B**QUESTION 2**

- | | | | | |
|-----|-------|--|-----|--|
| | 2.1.1 | DNA profiling✓ | | (1) |
| | 2.1.2 | No answer | | |
| | 2.1.3 | No answer | | |
| | 2.1.4 | - To identify the child's maternal DNA bands✓
- so that the remaining bands can be compared with the possible father's DNA bands✓ | | (2)
(3) |
| 2.2 | 2.2.1 | (a) Methionine✓

(b) UAA✓

(c) CCA✓ | | (1)

(1)

(1) |
| | 2.2.2 | (a) 15✓/1 nucleotide(s)

(b) 3 ✓ | | (1)

(1) |
| | 2.2.3 | Gives the coded information for the amino acid sequence ✓ | | (1) |
| | 2.2.4 | Gene✓ mutation | | (1) |
| | 2.2.5 | - The sequence of bases on a DNA molecule changes✓
- from GAA to TAA✓ /first base in DNA triplet changed from G to T
- The codon CUU changed to AUU✓
- The anticodon changed from GAA to UAA ✓
- Amino acid sequence changed from leucine to Isoleucine✓ | Any | (4)
(11) |
| 2.3 | 2.3.1 | Group 2 | | (1) |
| | 2.3.2 | (a) 2✓

(b) 2✓ | | (1)

(1) |
| | 2.3.3 | (a) - To act as a control✓
- for comparison with the groups where non-disjunction occurred✓

(b) - Non- disjunction occurred✓ in pair 22
- during anaphase I✓/meiosis I
- resulting in a gamete receiving two copies of chromosome✓
- instead of one copy of chromosome✓ | | (2)

(4)
(9) |

- 2.4 - The DNA double helix unwinds✓
 - and unzips✓ / (weak) hydrogen bonds break
 - to form two separate strands✓
 - Both strands serve as templates✓
 - to form a complementary DNA✓ / (A complementing T and C to G)
 - using free DNA nucleotides✓ from the nucleoplasm
 - to form two identical DNA molecules✓ Any **(6)**
- 2.5 2.5.1 Pedigree✓ diagram (1)
- 2.5.2 (a) 3✓ (1)
- (b) 2✓ (1)
- 2.5.3 (a) Female with Vitamin D-resistant rickets✓ (1)
- (b) Female without Vitamin D-resistant rickets✓ (1)
- (c) $X^D Y$ ✓ (1)
- 2.5.4 - Mother is without vitamin D-resistant rickets✓
 - Father has vitamin D-resistant rickets✓
 - Since daughter W inherits allele X^D from the father and
 - inherited allele X^d from the mother✓
 - she must have $X^D X^d$ ✓
 - and therefore, she has Vitamin D-resistant rickets✓ Any **(4)**
(8)
- 2.6 2.6.1 Short ears✓ (1)
- 2.6.2 It is masked by the dominant allele (long ear) in a heterozygous condition✓ (1)
- 2.6.3 P2 Phenotype: Long ears × Long ears✓
 Genotype: Ee × Ee✓
 Meiosis
 Gametes: E, e × E, e✓
 Fertilisation
 F2 Genotype: EE Ee Ee ee✓
 Phenotype: 3 Long ear, 1 short ear✓
 25%✓*
 P2 and F2✓
 Meiosis and fertilisation✓

OR

P2 Phenotype: Long ears × Short ears✓

Genotype : Ee × Ee✓

Meiosis

Gametes : E ,e × E , e✓

Fertilisation

Gametes	E	e
E	Ee	Ee
e	Ee	ee

1 mark for correct gametes

1 mark for correct genotype

F2 Genotype: EE,Ee,Ee,ee

Phenotype: 3 Long ear , 1 short ear✓

25%✓*

P2 and F2✓

Meiosis and fertilisation ✓

Any

(6)

(8)**[47]**

QUESTION 3

3.1 3.1.1 Age of the stem cell donors (1)

- 3.1.2 (a) - Conditions in which stem cells were cultured✓
- Number of stem cells per group✓
- (Only) viable stem cells were used✓
- Number of days (7 days) after which percentage increase was calculated✓
- Any (2)

MARK FIRST TWO ONLY

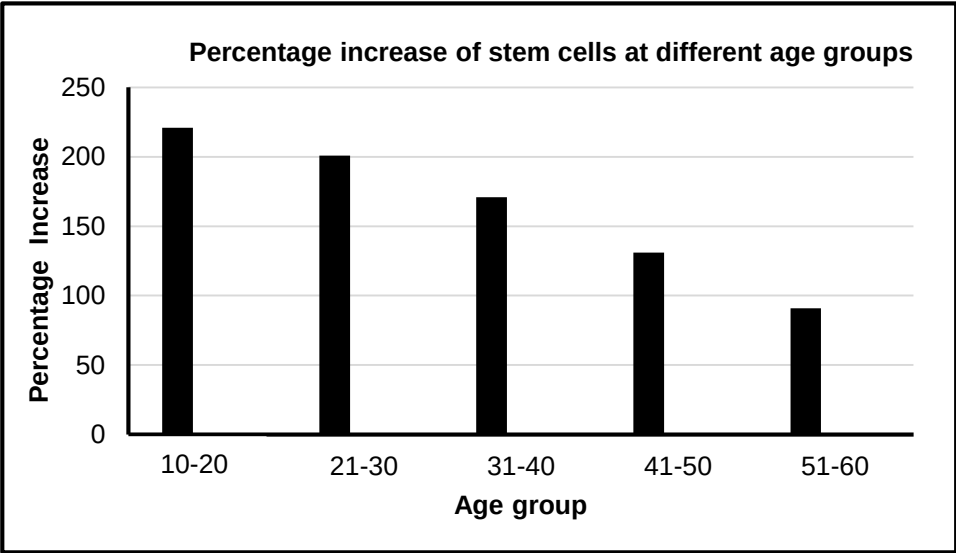
(b) To ensure reliability✓ (1)

3.1.3 $\frac{130}{100} \times 1000$

=1300

(3)

3.1.4



Criteria for marking the graph:

Criteria	mark allocation
Type of graph: Bar graph is drawn (T)	1
Caption of graph includes both variables (C)	1
Correct labels and units on X-axis and Y-axis (L)	1
Scale (S) - Correct scale for Y-axis and - Same width of bars for X-axis	1
Plotting: (P) - 1 - 4 bars are plotted correctly - 5 bars are plotted correctly	1 2

If a histogram or line graph is drawn, marks will be lost for

- Type of graph
- Scale

If axes are transposed:

- Can get all marks, if labels are swapped and bars are horizontal
- If labels are not corresponding, then:
 - Marks will be lost for scale and labels
 - Plotting can get credit if coordinates are correct for given labels

3.2	3.2.1	Colour (dark/light) of volcanic rocks✓		(1)
	3.2.2	No answer		
	3.2.3	- Acquired characteristics are not inherited✓ - Organisms do not evolve because they wanted to evolve✓/deterministic		(2) (3)
3.3	3.3.1	- A group of organisms of the same species✓ - occupying the same habitat✓ - at the same time✓	Any	(2)
	3.3.2	(a) Antibiotic treatment✓ (b) They increased✓/more survived		(1) (1)
	3.3.3	- There was variation (mutation)in the bacterial population✓ - Some bacteria were resistant to the antibiotic✓ - and others were not✓ - When bacteria were exposed to the antibiotic✓ - Those that were not resistant died✓ - Those that were resistant to the antibiotic survived and reproduce✓ - and passed the allele for resistance to their offspring - The next generation had the higher proportion of bacteria with antibiotic-resistance✓	Any	(7) (11)
3.4	3.4.1	<i>Homo habilis</i> ✓		(1)
	3.4.2	- <i>Australopithecus</i> fossils were found in Africa only✓ - The oldest <i>Homo erectus</i> fossils were found in Africa✓ - while the younger <i>Homo erectus</i> fossils were found in other parts of the world✓		(3)
	3.4.3	(a) - Human spine has S shaped curve✓ - to keep body upright✓/maintain balance while walking on two legs		(2)
		(b) - Pelvic girdle is short and wide✓ - to support the upper body weight✓		(2) (8)

3.5 3.5.1 *Homo*✓ (1)

3.5.2 A✓ (1)

T✓

3.5.3	DIAGRAM A	DIAGRAM B
	Brow ridge is well developed✓	Brow ridge is not well developed✓
	More protruding jaw✓/large jaw	Less protruding jaw✓/small jaw

1 mark for Table + 4 (5)

3.5.4 (a) - Small teeth✓
- indicating change to soft, cooked food✓ (2)

(b) - Bigger brain volume✓
- therefore, more intelligence✓ (2)

(11)
[46]

CANDIDATE MARK	ADJUSTMENT
0 - 10	No mark (0)
11 - 30	+1 mark
31 - 52	+2 mark
53 - 70	+3 mark
71 - 91	+4 mark
92 - 112	+5 mark
113 - 132	+6 mark
133 - 143	+7 mark

TOTAL SECTION B: 100

GRAND TOTAL: 150