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: $2^{1}/_{2}$ hour

This marking guideline consists of 11 pages.

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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.

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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.

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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)

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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**

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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✓ (1)

(b) UAA✓ (1)

(c) CCA✓ (1)

2.2.2 (a) 15✓/1 nucleotide(s) (1)

(b) 3 ✓ (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✓ (1)

(b) 2✓ (1)

2.3.3 (a) - To act as a control✓
- for comparison with the groups where non-disjunction occurred✓ (2)

(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✓ (4)
(9)

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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^DY✓ (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^DX^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)

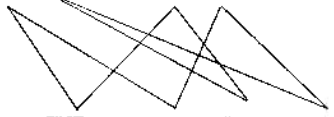
2.6.3 P2 Phenotype: Long ears × Long ears✓

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)

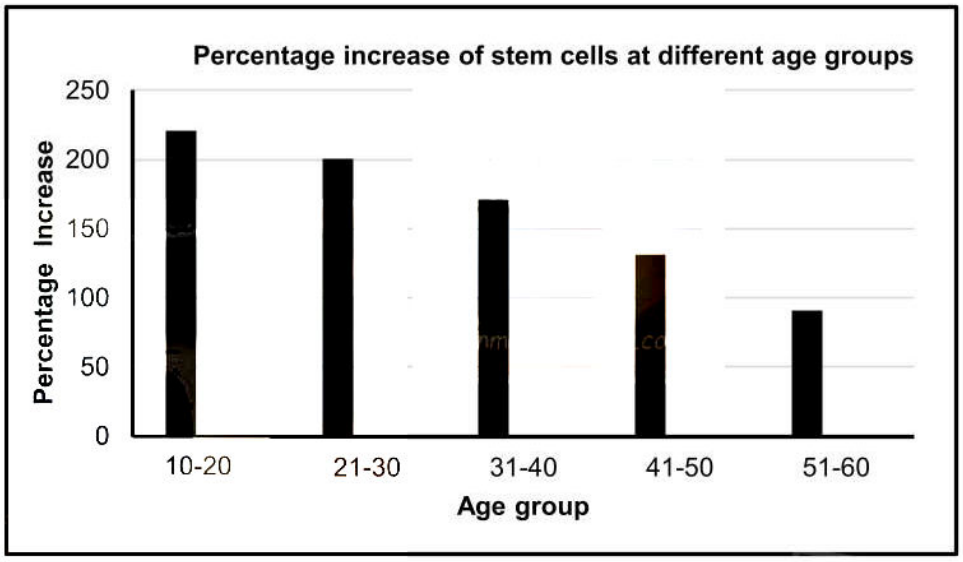
MARK FIRST TWO ONLY

(b) To ensure reliability✓ (1)

3.1.3 $\left.\frac{130}{100}\right\}$ ✓ $\times 1000$✓

=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

(6)

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 swopped 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✓ (1)

(b) They increased✓/more survived (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 *Homo habilis*✓ (1)

3.4.2
- *Australopithecus* fossils were found in Africa only✓
- The oldest *Homo erectus* fossils were found in Africa✓
- while the younger *Homo erectus* 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)

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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

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