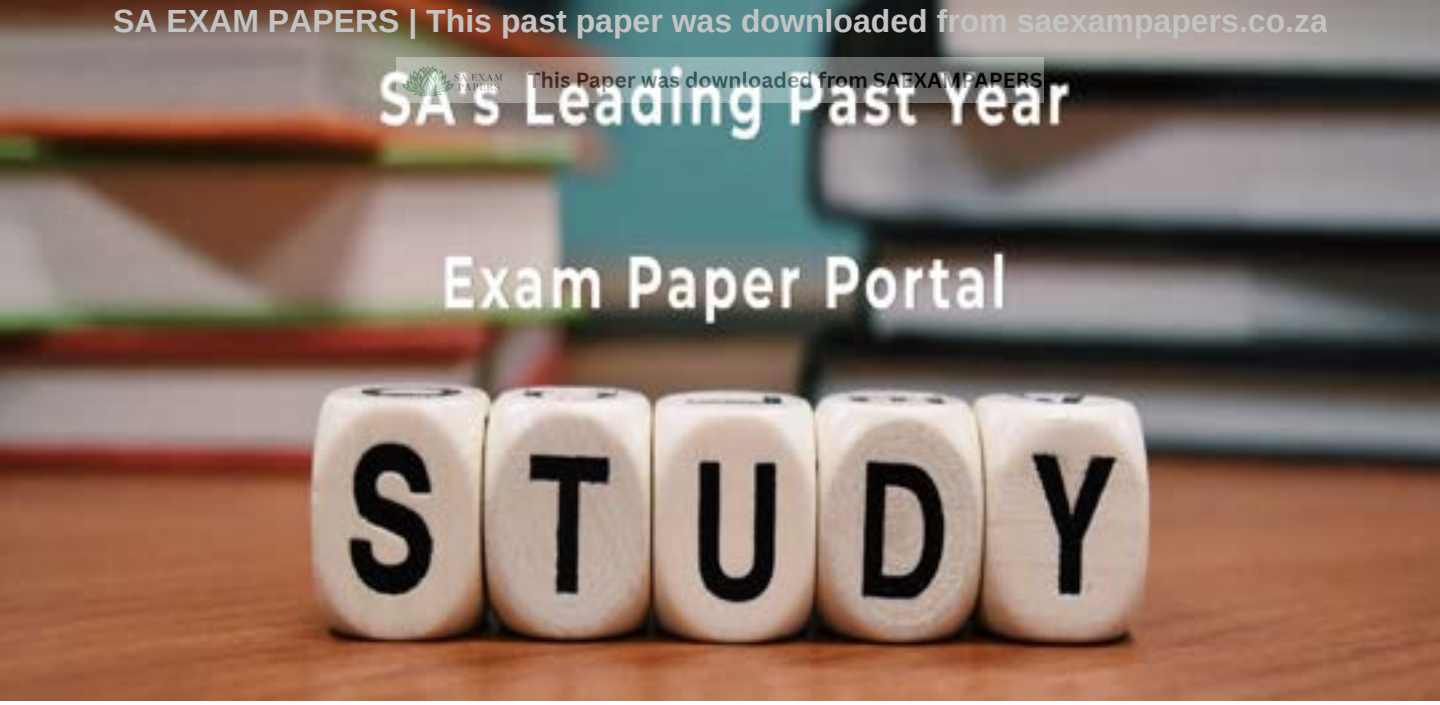


education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 12

LIFE SCIENCES
JUNE 2025
MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 11 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES

1. **If more information than marks allocated is given**
   Stop marking when maximum marks is 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 are 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 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 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 memo discussion meeting.

14. **If only the letter is asked for, and only the name is given (and vice versa)**
Do not 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 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.

Changes to the memorandum

19. No changes must be made to the marking memoranda without consulting the subject advisor.

SECTION A

QUESTION 1

1.1	1.1.1	D ✓✓		
	1.1.2	C ✓✓		
	1.1.3	A ✓✓		
	1.1.4	B ✓✓		
	1.1.5	A ✓✓		
	1.1.6	B ✓✓		
	1.1.7	D ✓✓		
	1.1.8	C ✓✓		
	1.1.9	A ✓✓		
	1.1.10	B ✓✓		
			(10 × 2)	**(20)**
1.2	1.2.1	Monohybrid✓ cross		
	1.2.2	Oestrogen ✓		
	1.2.3	Cytokinesis ✓		
	1.2.4	Motor✓ neuron		
	1.2.5	Peptide✓ bonds		
	1.2.6	Seminiferous tubules ✓		
	1.2.7	Incomplete✓ dominance		
	1.2.8	Medulla oblongata ✓		
	1.2.9	Karyotype ✓/karyogram		
			(9 × 1)	**(9)**
1.3	1.3.1	B only ✓✓		
	1.3.2	None ✓✓		
	1.3.3	B only ✓✓	(3 × 2)	**(6)**
1.4	1.4.1	(a) (DNA) nucleotide ✓		(1)
		(b) Phosphate ✓		(1)
		(c) Deoxyribose ✓		(1)
		(d) Cytosine ✓		(1)
		(e) (Weak) hydrogen bonds ✓		(1)
	1.4.2	DNA ✓		(1)
	1.4.3	It is double-stranded ✓/presence of hydrogen bonds		(1)
	1.4.4	TCGTC ✓✓		(2)
	1.4.5	Mitochondrion ✓		(1)
				(10)
	1.5.1	(a) F ✓ Epididymis ✓		(2)
		(b) D ✓ Seminal vesicle ✓		(2)
	1.5.2	Vas deferens ✓/sperm duct		(1)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 (a) B ✓ (1)
(b) A ✓ (1)
(c) F ✓ (1)

2.1.2 Serves as attachment site of the foetus to the mother. ✓
Diffusion of nutrients from the mother to the foetus. ✓
Gaseous exchange between the blood of the mother and the blood of the foetus/transport of carbon dioxide to the mother and oxygen to the foetus. ✓
Removal of waste products from the foetus. ✓
Secretes progesterone to maintain gestation. ✓
Acts as a filter for most pathogens. ✓
(Mark first TWO only) (2)

2.1.3
- It is muscular ✓
  to protect the foetus from mechanical injury ✓/allow for birth.
- It is flexible ✓/expandable
  to accommodate the growing foetus. ✓
- It is hollow ✓
  to accommodate the growing foetus. ✓
- It has a thickened endometrium ✓
  for implantation ✓/survival of the foetus.

(Mark first ONE only) Any (1 × 2) (2)

2.1.4
- Nutrients/oxygen will not be transported to the foetus. ✓
  No growth will occur ✓/since there will be no energy available/foetus will die/abort.
- Waste products (for example urea/CO2) will not be transported back to the placenta ✓/will accumulate in the foetus, increasing toxicity ✓/foetus will die/abort.

(2 x 2) (4)

2.1.5 There is little ✓*/no chance of fertilisation.
Progesterone levels are high, ✓
inhibiting FSH✓ secretion.
No new follicles mature ✓/develop.
Therefore, no ovulation will occur, ✓
and no ovum is available for fertilisation. ✓

***1 Compulsory mark** & Any 3 (4)
(15)

2.2 Diploid cells in the ovary undergo mitosis ✓
to form numerous follicles. ✓
At the onset of puberty ✓
and under the influence of FSH, ✓
one cell inside a follicle enlarges and undergoes meiosis. ✓
Of the four cells that are produced, only one survives to form a mature haploid ovum. ✓
This occurs in a monthly cycle. ✓

Any **(5)**

2.3 2.3.1 Internal✓ fertilisation (1)

2.3.2 No water is needed for fertilisation. ✓
Prevents dehydration of the fertilised ovum. ✓
Lower mortality among the young. ✓
Better protection for the embryo/foetus. ✓
Higher chances of fertilisation. ✓
(Mark first TWO only) (2)

2.3.3 Ovipary ✓ (1)

2.3.4 The egg/young is kept in a pouch. ✓
The young feeds on milk. ✓ (2)

2.3.5 Altricial ✓ (1)

2.3.6 The young is hairless. ✓
The young is kept in a pouch. ✓
(Mark first ONE only) (1)
(8)

2.4 2.4.1 (a) Anaphase I ✓ (1)
(b) Anaphase II ✓ (1)

2.4.2 In **A** a homologous pair ✓ of chromosomes failed to separate. ✓
In **B** chromatids ✓ failed to separate. ✓

Any (3)

2.4.3

Differences between Mitosis and Meiosis	
Mitosis	**Meiosis**
Occurs in somatic cells	Occurs at gonads/gametes
Two daughter cells form	Four daughter cells form
One division	Two divisions
Chromosome number remains constant	Chromosome number halved
No crossing over	Crossing over occurs
Daughter cells identical to each other and to mother cell	Daughter cells different to each other and to mother cell

Table (with a heading for each column) ✓
First (2 × 2) (5)
(10)

2.5 2.5.1 A genetic disorder carried on the X chromosome ✓/ gonosomes. (1)

2.5.2 4 ✓ (1)

2.5.3 (a) $X^N X^n$ ✓✓ (2)

(b) $X^n X^n$ ✓✓ (2)

2.5.4 100% ✓✓ (2)

2.5.5 Haemophilia ✓
Colour blindness ✓ (2)

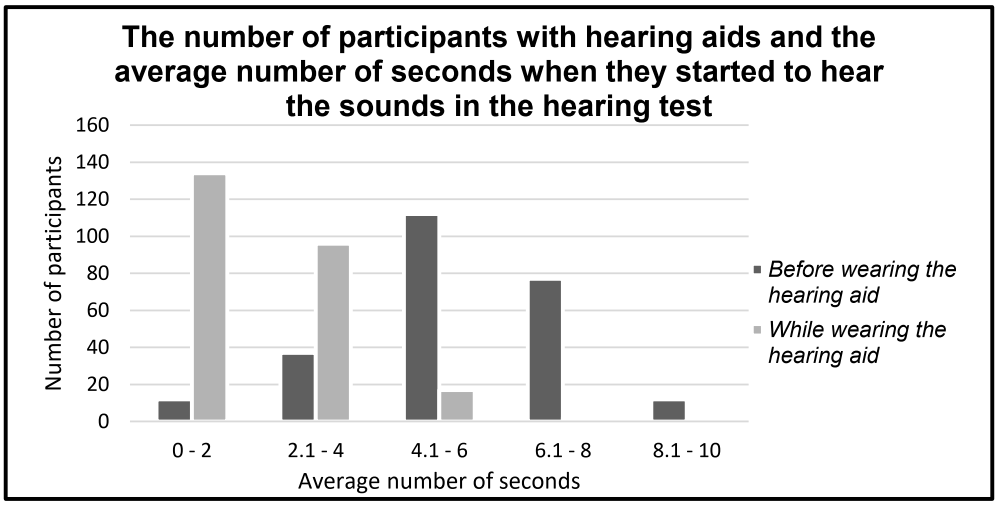
2.5.6 Parent 2 is heterozygous/a carrier. ✓
Mothers that are heterozygous for a sex-linked disorder can pass it on to their sons, ✓
because they only need one X chromosome to be affected. ✓

Any (2)
(12)
[50]

QUESTION 3

3.1	3.1.1	Synapses ✓	(1)
	3.1.2	The volume of growth. ✓ How functions are assigned to each location in the brain. ✓	(2)
	3.1.3	250 000 ✓ × 60 ✓ = 15 000 000 ✓	(3)
	3.1.4	Genetic ✓	(1)
	3.1.5	Cerebrum ✓	(1) **(8)**
3.2	3.2.1	(a) Quality of hearing ✓	(1)
		(b) To determine the effect of a new hearing aid on the hearing quality of middle-aged adults. ✓✓	(2)
	3.2.2	300 participants were used. ✓	(1)
	3.2.3	For them to get used to hearing with the hearing aids. ✓ To prevent distortion of sounds with the follow-up hearing test. ✓ Any	(1)
	3.2.4	They act as the control group. ✓ Their results will be compared to the other participants ✓/their results serve as a baseline. To ensure the changes in hearing quality is caused by the hearing aids. ✓ Any	(2)
	3.2.5	The same hearing test had to be used for all. ✓ None of the participants should have hearing problems/ noticeable hearing disorders. ✓ The same type of hearing aid had to be used for all. ✓ Use participants of the same age. ✓ The same team of researchers should conduct the investigation throughout. ✓ **(Mark first THREE only)** Any	(3)
	3.2.6	The hearing aid improves the hearing quality of middle-aged adults. ✓✓	(2)

3.2.7



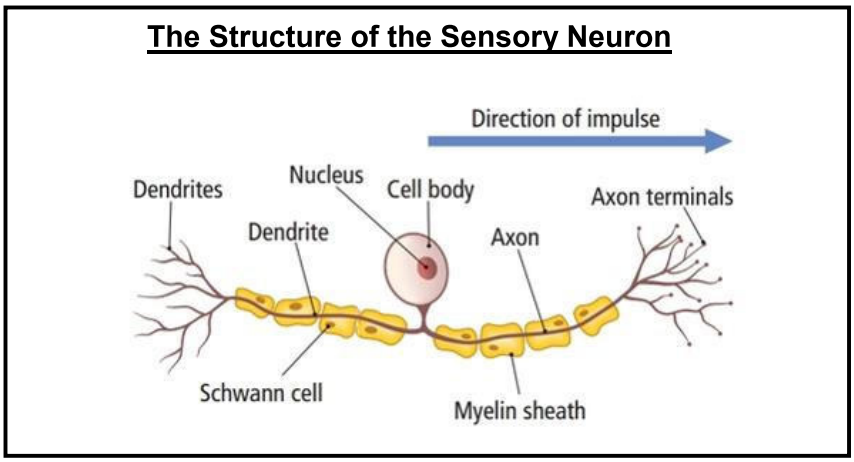
Criteria	Mark allocation
Heading / caption (with both variables) **(C)**	1
Type of graph **(T)**	1
Labels for X and Y axes **(L)**	1
Scale **(S)**	1
Plotting **(P)**: All 10 correctly plotted: 1 to 9 correctly plotted:	 2 1

(6)

3.3.1 (a) Suspensory ligaments ✓
(b) Sclera ✓ (2)

3.3.2 The bright light will cause
the circular muscles (of the iris/part B) to contract ✓
and the radial muscles to relax, ✓
decreasing the size of the pupil. ✓ (3)

3.3.3



Structure of the sensory neuron (**caption**) ✓
Correct **drawing** ✓
Any FOUR labels (6)

3.4 3.4.1 **P_1** Phenotype: Blood group A x Blood group O ✓
Genotype: $I^A i$ x i i ✓
Meiosis
G/gametes I^A , i x i , i ✓

Fertilisation

	I^A	i
i	$I^A i$	i i
i	$I^A i$	i i

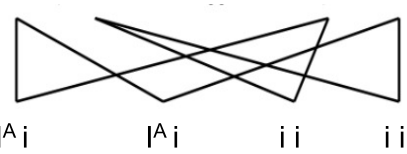
F_1 Genotype: 2 $I^A i$; 2 i i ✓
Phenotype: 2 blood group A ; 2 blood group O ✓

P_1 and F_1 ✓
Meiosis and fertilisation ✓

OR

P_1 Phenotype: Blood group A x Blood group O ✓
Genotypes: $I^A i$ x i i ✓
Meiosis
G/gametes I^A , i x i , i ✓

Fertilisation



F_1 Genotype: 2 $I^A i$; 2 i i ✓
Phenotype: 2 blood group A ; 2 blood group O ✓

P_1 and F_1 ✓
Meiosis and fertilisation ✓

Any (6)

3.4.2 Many individuals in the population have the same blood group. ✓
Therefore, only possibilities can be determined ✓ and some possibilities eliminated. ✓

Any (2)
(8)

3.5	3.5.1	(a) D ✓	(1)
		(b) A ✓	(1)
		(c) B ✓	(1)
	3.5.2	Animals with desired characteristics (more meat/proteins/ bigger eggs/resistance to disease etc.) can be cloned. ✓ Endangered species can be saved. ✓	(2)
			(5)
			[50]

TOTAL SECTION B: 100
GRAND TOTAL: 150