



Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Departement van Onderwys
Porafensie Ya Kapa Botjhabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 12

JUNE 2025

LIFE SCIENCES MARKING GUIDELINE

MARKS: 150

This marking guideline consists 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 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. 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 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 | D ✓✓ | | |
| | 1.1.2 | B ✓✓ | | |
| | 1.1.3 | B ✓✓ | | |
| | 1.1.4 | A ✓✓ | | |
| | 1.1.5 | B ✓✓ | | |
| | 1.1.6 | D ✓✓ | | |
| | 1.1.7 | D ✓✓ | | |
| | 1.1.8 | B ✓✓ | | |
| | 1.1.9 | C ✓✓ | (9 x 2) | (18) |
| 1.2 | 1.2.1 | Peripheral ✓nervous system | | |
| | 1.2.2 | Multiple sclerosis ✓ | | |
| | 1.2.3 | Interphase ✓ | | |
| | 1.2.4 | Precocial ✓ development | | |
| | 1.2.5 | Convex ✓lenses | | |
| | 1.2.6 | Centriole ✓/centrosome | | |
| | 1.2.7 | Retina ✓ | | |
| | 1.2.8 | Synapse ✓ | (8 x 1) | (8) |
| 1.3 | 1.3.1 | Both A and B ✓✓ | | |
| | 1.3.2 | A only ✓✓ | | |
| | 1.3.3 | B only ✓✓ | (3 x 2) | (6) |
| | 1.4.1 | (a) Menstruation ✓ | | (1) |
| | | (b) Ovulation ✓ | | (1) |
| | 1.4.2 | (a) LH ✓/Luteinising hormone | | (1) |
| | | (b) Progesterone ✓ | | (1) |
| | 1.4.3 | (a) Ovarian ✓ cycle | | (1) |
| | | (b) Uterine ✓cycle | | (1) |
| | 1.4.4 | Ovary ✓ | | (1) |
| | 1.4.5 | (a) Ovum ✓ | | (1) |
| | | (b) Endometrium ✓ | | (1) |

1.5	1.5.1	Cytoplasm ✓	(1)
	1.5.2	(a) Peptide ✓	(1)
		(b) mRNA ✓/ messenger RNA/ messenger Ribonucleic acid	(1)
	1.5.3	(a) Anticodon ✓	(1)
		(b) tRNA ✓/ transfer Ribonucleic acid	(1)
		(c) Ribosome ✓	(1)
	1.5.4	ACC ✓	(1)
	1.5.5	2 ✓ Amino acid ✓	(2)

TOTAL SECTION A: 50

QUESTION 2

- 2.1 2.1.1 - An arrangement of black bars/lines/stripes representing DNA fragments of a person ✓✓

OR

- The pattern of the bars that indicate the sequence of bases on a DNA strand. ✓✓

OR

- A set of genetic characteristics that results from forensic DNA analysis of several DNA markers. ✓✓ (2)

- 2.1.2 B ✓ (1)

- 2.1.3 - A child received DNA from both parents ✓
- The DNA profiles of the mother, child and the possible father are determined ✓
- A comparison of the DNA bands of the mother and the child is made ✓
- The remaining DNA bands are compared to the possible father's DNA bands ✓
- If all the remaining DNA bands in the child's profile match the possible father's DNA bands then the possible father is the biological father ✓
- If all the remaining DNA bands in the child's profile does not match the possible father's DNA bands then the possible father is not the biological father ✓ (6)

- 2.1.4 - To identify individuals from their remains
- To identify family relationships other than paternity, e.g. siblings or cousins
- To test for the presence of specific alleles/ genes that cause a genetic disorder
- To establish matching tissues for organ transplants (Any 2 x 1) (2)

- 2.2 2.2.1 45 ✓ (1)

- 2.2.2 Gonosomes ✓/sex chromosomes (1)

- 2.2.3 - Edwards syndrome have three copies of chromosome 18 ✓ instead of the usual two
- Down syndrome have three copies of chromosome 21 ✓ instead of the usual two (2)

- 2.2.4 - During Anaphase I / II ✓
 - Non-disjunction ✓ occurs
 - in chromosome pair 18 ✓/chromatids of chromosome 18 which
 - will lead to the formation of a gamete with an extra chromosome number 18 ✓/2 chromosomes number 18
 - If this gamete fuses with a normal gamete ✓
 - a zygote with 3 chromosomes number 18 will form ✓
 - The fusion between an abnormal gamete (24 chromosomes) and a normal gamete (23 chromosomes) may lead to Edwards syndrome ✓
 (Any 6 x 1) (6)

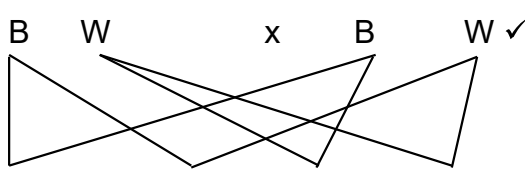
2.3 2.3.1 Co-dominance ✓ (1)

- 2.3.2 - The alleles are equally dominant ✓
 - both are expressed in the phenotype ✓ (2)

2.3.3 **P₁** Phenotype Speckled feather: x Speckled feathers
 Genotype BW ✓ x BW ✓

Meiosis
G/gametes B W x B W ✓

Fertilisation



F₁ Genotype: BB ; BW ; BW ; WW ✓*

Phenotype: 1 black : 2 speckled : 1 white ✓*

P₁ and F₁ ✓

Meiosis and fertilisation ✓ ***two compulsory marks and Any 4**

OR

P₁ Phenotype Speckled feathers x Speckled feathers
 Genotype BW ✓ x BW ✓

Meiosis
G/gametes B, W x B, W ✓

Fertilisation

Gametes	B	W
B	BB	BW
W	BW	WW
Correct gametes ✓		
Correct genotypes ✓*		

Phenotype 1 black : 2 speckled : 1 white ✓*

P₁ and F₁ ✓

Meiosis and fertilisation ✓ ***two compulsory marks and Any 4** (6)

- 2.4 2.4.1 (a) Medulla oblongata ✓ (1)
 (b) Corpus callosum ✓ (1)
- 2.4.2 A ✓ (1)
- 2.4.3 Behind and below the cerebrum ✓✓ (2)
- 2.4.4 (a) - Part **A**/ cerebrum which receives and interprets sensations from sense organs ✓
 - Part **A**/ cerebrum was not injured ✓ (2)
- (b) - The learner (occasionally) experience difficulty balancing when kicking ✓
 - due to no coordination of voluntary movements by cerebellum ✓ / decreased muscle tone (2)
- 2.5.1 (a) Semi-circular canals ✓ (1)
 (b) Tympanic membrane ✓/ eardrum (1)
- 2.5.2 (a) F ✓ (1)
 (b) B ✓ (1)
- 2.5.3 Part C/ Oval window transfers pressure wave **to** the inner ear. ✓ /
 Receives vibrations **from** the ossicle/ middle ear
 Part E/ Round window receives pressure waves **from** the inner ear ✓ /
 transfers pressure waves **to** the middle ear / eustachian tube (2)
- 2.5.4 Organ of Corti ✓/hair cells (1)
- 2.5.5 - Air will not be move in ✓/out of middle ear
 - to equalise pressure on both sides of the tympanic membrane ✓
 - Tympanic membrane/ossicles may not vibrate freely ✓
 - This may lead to the tympanic membrane bursting ✓
 - and therefore, could lead to hearing loss ✓/deafness (Any 4 x 1) (4)

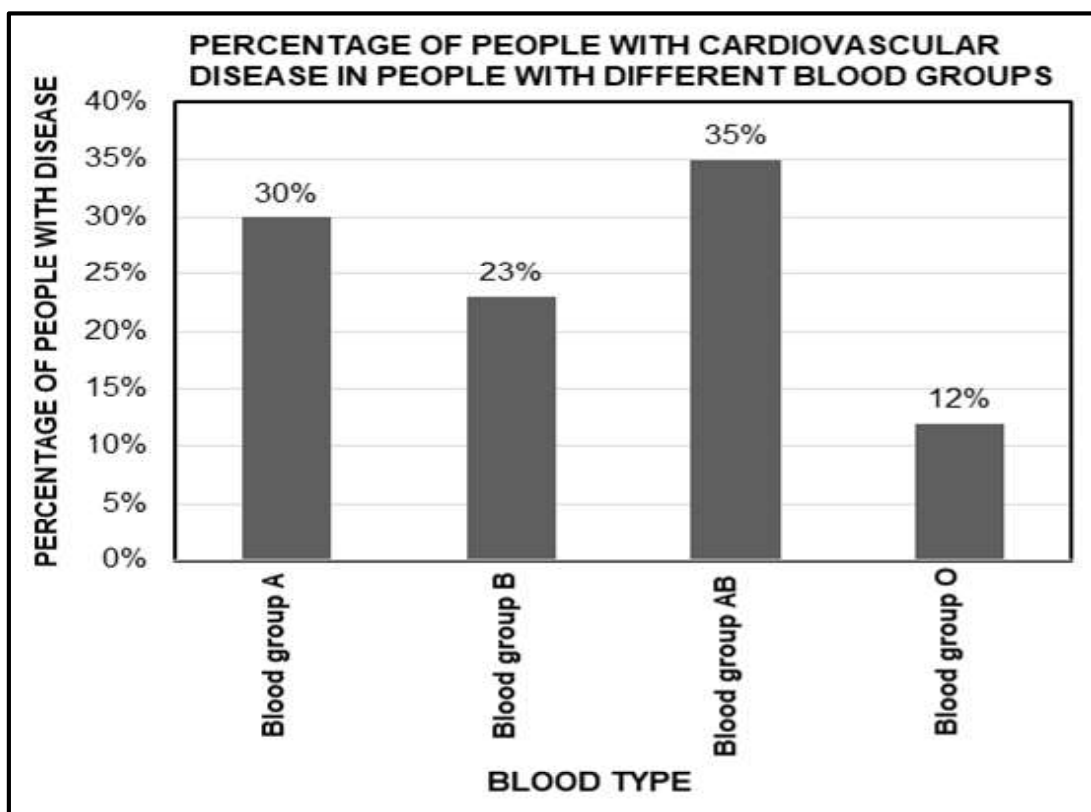
[50]

QUESTION 3

- 3.1 3.1.1 - Amniotic ✓ fluid (1)
- 3.1.2 - Shock absorber, ✓ protects the foetus from mechanical damage ✓
- Thermoregulation ✓ prevents extreme temperature changes ✓
- Moist environment ✓ to prevent desiccation ✓
- Free movement ✓ within the womb, promoting muscular and skeletal development ✓
- Environment ✓ provides the medium in which the foetus moves /breathes / swallows ✓ (Any 1 x 2) (2)
- (Mark first ONE only)**
- 3.1.3 - After implantation the chorion develops many finger-like outgrowths ✓
- called chorionic villi ✓
- The endometrium ✓
- together with the chorionic villi ✓ forms the placenta
- The umbilical artery ✓ and the umbilical vein ✓ develops inside a hollow tube ✓ to form the umbilical cord between the foetus and the placenta ✓ (Any 6 x 1) (6)
- 3.1.4 Increased progesterone and oestrogen concentrations:
- inhibits the pituitary gland ✓ from
- secreting FSH ✓ and
- secreting LH ✓
- therefore, no Graafian follicle will develop ✓
- No ovulation will take place ✓/ No ovum will be present for fertilisation (Any 4 x 1) (4)
- 3.1.5 - The Fallopian tube is unable to provide the space ✓
- and there is no endometrium ✓/blood supply
- to provide nutrients ✓/oxygen **OR** remove waste products
- in order for the embryo to develop ✓ (4)
- 3.2 3.2.1 - Breast development ✓
- Start of menstruation ✓
- Widening of the hips ✓
- Growth of pubic hair ✓
- Growth of underarm hair ✓ (Any 2 x 1) (2)
- (Mark first TWO only)**
- 3.2.2 - Under the influence of testosterone ✓
- diploid cells in the seminiferous tubules of the testes ✓
- undergo meiosis ✓
- to form haploid sperm cells ✓ (4)

- 3.3 3.3.1 - sperm and ova are in close contact ✓ to increase the chance of fertilisation taking place ✓
 - gametes not exposed to predators ✓ / water currents / desiccation to increase chance of fertilisation ✓
 - does not rely on water for gamete transport ✓ increase possibility of fertilisation taking place ✓
 - reduces the risk of gametes being lost or wasted, ✓ increasing chance of fertilisation ✓ (Any 2 x 2) (4)
- 3.3.2 parental care increases ✓ the chances of offspring survival (1)
- 3.4 - Less light would enter the eye ✓ / pupil
 - Less light would fall on the retina ✓ / receptors would be stimulated less
 - The image would not be clear ✓ (3)
- 3.5 3.5.1 Wheat without insect poison gene that was grown in the field ✓ (1)
- 3.5.2 Ensuring that any differences in yield are due to genetic modification ONLY ✓✓ /and not external factors (1)
- 3.5.3 $(70 - 50) \checkmark = 20 \checkmark$ (arbitrary units) (2)
- 3.5.4 - Non-GM plants may be better suited ✓ to the local environment (specific climates, soil, or farming practices), while GM plants may not ✓ always be as well-suited to local conditions.
 - Non-GM plants may be better equipped to handle stresses (like drought, competition with weeds, nutrient limitations) ✓ while GM plants may not ✓ always be as well-suited to local conditions.
 - Non-GM plants may maintain more natural or symbiotic relationships with beneficial soil organisms, ✓ giving them an advantage in nutrient uptake and overall health. ✓
 - Non-GM plants contributes to biodiversity and help maintain a balanced ecosystem ✓
 - GM plants, especially, can disrupt local ecosystems by affecting non-target insects and other organisms ✓
 - GM crops can lead to the rise of weeds ✓ that are resistant to pesticides (insect poison)
 - decreasing their effectiveness. ✓ (Any 1 x 2) (2)
- 3.5.5 Insect poison reduces ✓ insect populations numbers and biodiversity. (1)
- 3.6 3.6.1 To determine the relationship between different blood groups and risk to specific diseases. ✓✓ (2)
- 3.6.2 - Determine the sample size
 - Decide on the age-group of the participants
 - Decide on diseases to be tested for (Any 2 x 1) (2)
(Mark first TWO only)
- 3.6.3 500 individuals ✓ participated (1)

3.6.4



Guideline for assessing graph:

CRITERIA	MARK
Bar graph is drawn (T)	1
Caption of the graph includes both variables (C)	1
Correct labels on the X-axis and Y-axis with correct unit on the Y-axis (L)	1
Correct scale for Y-axis and bars of equal width and spaces for X-axis (S)	1
Plotting (P) correctly done for: 1–3 blood types	1
All 4 required blood types	1

(6)

- Bar graph or line graph drawn – Lose marks for type of graph and scale
- Transposed axes: Can get full credit, if axes labels are also swapped and bars are horizontal. If labels are not corresponding, then lose marks for labels and scale
- Check that the plotting is correct for the given labels

[50]**TOTAL SECTION B: 100****GRAND TOTAL: 150**