Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

JUNE 2025

LIFE SCIENCES
AMMENDED MARKING GUIDELINE

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MARKS: **150**

This amended marking guideline consists of 12 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 memo discussion meeting.

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

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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 ✓✓ Only one answer required D/C x
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 NO ABBREVIATION
1.2.2 Multiple sclerosis ✓
1.2.3 Interphase✓
1.2.4 Precocial ✓ development
1.2.5 convex ✓lenses biconvex / converging
1.2.6 Centriole ✓/centrosome
1.2.7 Retina ✓
1.2.8 Synapse✓ synaptic✓cleft (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✓/Luteinizing 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✓ egg cell (NOT egg) / ruptured Graafian follicle (NOT Graafian follicle only (1)
(b) endometrium✓ / endometrial ✓wall (1)
[9]

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1.5	1.5.1		cytoplasm✓ / nucleus / nucleoplasm / ribosome	(1)
	1.5.2	(a)	Peptide✓	(1)
		(b)	mRNA✓/messenger RNA/messenger Ribonucleic acid codon is not a molecule – do not accept	(1)
	1.5.3	(a)	Anticodon ✓	(1)
		(b)	tRNA✓/transfer Ribonucleic acid	(1)
		(c)	Ribosome ✓ Nucleus	(1)
	1.5.4		**ACC**✓	(1)
	1.5.5		2✓ Amino-acid✓	(2)
				[9]
			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 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✓ / DNA samples from the mother, child and possible father are obtained
- 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✓

or

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 missing persons
- 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 diagnose genetic disorders
- To establish matching tissues for organ transplants / To identify blood broups/ presence of specific alleles (Any 2) (2)

(11)

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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 ✓ / extra chromosome at position 18 instead of the usual two.
- Down syndrome have three copies of chromosome 21 ✓ / extra chromosome at position 21 instead of the usual two. (2)

2.2.4
- During Anaphase I ✓/ II
- **Non-disjunction** ✓ occurs / chromosomes / chromatids failed to separate
- of chromosome pair 18✓/chromatids of chromosome 18
- will lead to the formation of a gamete with an extra chromosome number 18✓/2 of 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) (6)

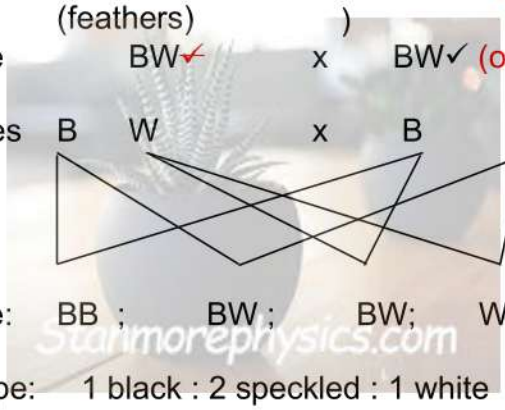
(10)

2.3 2.3.1 Co-dominance ✓ (1)

2.3.2
- The allele for black feather colour and the allele for white feather colour are equally dominant✓ and
- both are expressed in the phenotype✓ (2)

2.3.3

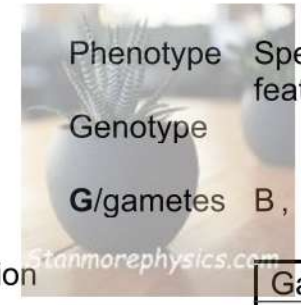
P_1	Phenotype	Speckled (feathers)	x	Speckled✓(feathers)	
	Genotype	BW✓	x	BW✓	(one mark)
Meiosis					
	G/gametes	B W	x	B W ✓	
Fertilisation					
F_1	Genotype:	BB ; BW ;	BW;	WW ✓*	
	Phenotype:	1 black : 2 speckled : 1 white ✓*			



P_1 and F_1✓
Meiosis and fertilisation ✓
***two compulsory marks and Any 4**

OR

P_1	Phenotype	Speckled feathers	x	Speckled feathers✓	
	Genotype	BW ✓	x	BW ✓	
Meiosis					
	G/gametes	B , W	x	B , W ✓	
Fertilisation					
F_1					



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

Phenotype 1 black : 2 speckled : 1 white ✓*

P_1 and F_1✓
Meiosis and fertilisation ✓ ***two compulsory marks and Any 4** (6)
(9)

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✓✓
OR
behind the medulla✓✓/ behind brain stem 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)

(9)

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 vibrations/ **to** the inner ear. ✓ / receives vibrations **from** the ossicle/ middle ear / sets up pressure waves in inner 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)

2.5.4
- Air will not be move in✓/out of middle ear
- to equalise pressure✓ on both sides of the tympanic membrane✓
- Tympanic membrane/ossicles will not vibrate freely ✓ /ossicles will vibrate less
- Less/no pressure waves generated in cochlea✓ / inner ear
- will lead to hearing loss✓/deafness

OR

- Air will not be move in✓/out of middle ear
- to equalise pressure✓ on both sides of the tympanic membrane✓
- This will lead to the tympanic membrane bursting✓
- Tympanic membrane/ossicles will vibrate less ✓
- Less/no pressure waves generated in cochlea✓ / inner ear
- will lead to hearing loss✓/deafness

OR

- Fluid won't drain out of middle ear✓
- Leads to fluid buildup in middle ear✓
- Tympanic membrane/ossicles will not vibrate freely ✓ /will vibrate less
- Less/no pressure waves generated in cochlea✓ / inner ear
- Which would lead to hearing loss✓/deafness

Any 1 x 4 (4)

(11)

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QUESTION 3

3.3 3.1.1 ~~- Amniotic✓ fluid~~ ~~(1)~~

3.1.2 ~~- Shock absorber✓, protects the fetus 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)~~
~~**(Mark first ONE only)**~~ ~~(2)~~

Question removed and conversion table below to be used.

Marks obtained for 3.1.3 – 3.1.5	Marks to be added to 3.1
10 – 14	3
5 – 9	2
1 – 4	1
0	0

(3)

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) (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) (4)

3.1.5
- The fallopian tube is unable to provide the space✓ / unable to stretch
- and there is no endometrium✓/blood supply
- to provide nutrients✓/oxygen OR remove waste products
- in order for the embryo to develop✓

(4)
(17)

3.2 3.2.1
- breast development✓
- start of menstruation✓
- widening of the hips✓
- growth of pubic hair✓
- growth of underarm hair✓

(Any) (2)
(Mark first TWO only)

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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)

(6)

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 fertilisaion✓
- does not rely on water for gamete transport✓ increase possibility of fertilization 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./ it ✓ (1)

(5)

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)**

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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) ✓ = 20✓(arbitrary units) (3)

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)
(8)

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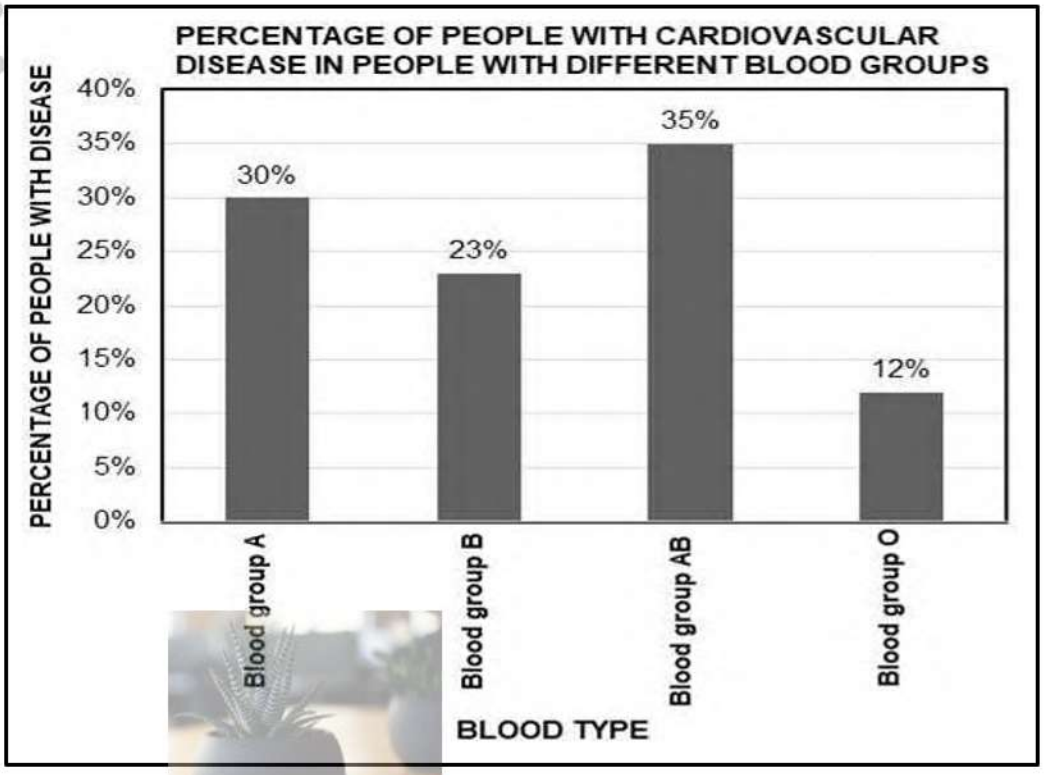
3.6 3.6.1 To determine the relationship between different blood groups and risk to specific diseases. ✓✓ (2)

3.6.2 - Determine the sample size✓
- Decide on the age-group of the participants ✓
- Decide on diseases to be tested for✓ (Any 2) (2)

(Mark first THREE only)

3.6.3 500 individuals ✓participated (1)

3.6



Criteria for assessing the graph:

CRITERIA	
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 All 4 required blood types	 1 1

-
- Histogram 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 (6)

(11)
[50]

TOTAL SECTION B: 100
GRAND TOTAL: 150

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