

# MARKING GUIDELINES

EXAMINATION		NATIONAL SENIOR CERTIFICATE	
GRADE		12	
DATE		MAY/JUNE 2025	
SUBJECT		LIFE SCIENCES	
PAPER		2	
MARK TOTAL		150	
DURATION (HOURS)		2½	
NUMBER OF PAGES		12	



SOUTH AFRICAN COMPREHENSIVE ASSESSMENT INSTITUTE  
SUID-AFRIKAANSE KOMPREENSIEWE ASSESSERINGSINSTITUUT

## FINAL APPROVED MARKING GUIDELINES

DATE OF MEETING	
UMALUSI MODERATOR	
CHIEF MARKER	
INTERNAL MODERATOR	



## PRINCIPLES RELATING TO MARKING LIFE SCIENCES 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 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 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 Marking Guideline 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. 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 captions.
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.
19. **No changes must be made to the Marking Guidelines without consulting the SACAI CHIEF MARKER and SACAI MODERATOR and where applicable, also the UMALUSI MODERATOR.**

## SECTION A

### QUESTION 1

1.1

1.1.1 C ✓✓

1.1.2 C ✓✓

1.1.3 A ✓✓

1.1.4 B ✓✓

1.1.5 B ✓✓

1.1.6 D ✓✓

1.1.7 C ✓✓

1.1.8 D ✓✓

1.1.9 B ✓✓

(9x2) **(18)**

1.2

1.2.1 tRNA/transfer RNA ✓

1.2.2 Heterozygous ✓

1.2.3 Homologous ✓ organs

1.2.4 Gradualism ✓

1.2.5 (Law of) use and disuse ✓

1.2.6 mtDNA/mitochondrial DNA ✓

1.2.7 Natural ✓ selection

1.2.8 Bivalent ✓

1.2.9 Hybrid sterility/infertility ✓

(9x1) **(9)**

1.3

1.3.1 A only ✓✓

1.3.2 Both A and B ✓✓

1.3.3 Both A and B ✓✓

(3x2) **(6)**

1.4

- 1.4.1 Dihybrid ✓ (1)
- 1.4.2 TWO ✓ characteristics are being used (1)
- 1.4.3 GGBB ✓  
GgBb ✓ (2)
- 1.4.4 a) GGBb ✓ (1)  
b) Grey fur and black eyes ✓✓ (2)
- 1.4.5 a)  $(24 \times \frac{4}{16}) \checkmark = 6 \checkmark$  (2)  
b) 0 ✓✓ (2)
- (11)**

1.5

- 1.5.1 All modern humans originated from Africa ✓ (1)
- 1.5.2 Out of Africa ✓ hypothesis (1)
- 1.5.3
- Fossils of *Ardipithecus/Australopithecus/Homo habilis* ✓ were found ONLY in Africa ✓
  - The oldest fossils of *Homo erectus/Homo sapiens* ✓ were found in Africa ✓ (4)
- (6)**

**TOTAL SECTION A: [50]**

## SECTION B

## QUESTION 2

2.1

2.1.1 DNA replication ✓ (1)

2.1.2 a) Thymine ✓ (1)

b) Deoxyribose ✓ sugar (1)

c) Phosphate ✓ (1)

2.1.3

DNA/deoxyribonucleic acid	RNA/ribonucleic acid
a) Deoxyribose sugar	a) Ribose sugar ✓
b) Thymine	b) Uracil ✓

(1 mark for table and 1 mark per difference x 2) (3)

2.1.4 At V, T binds to C ✓  
They are not complimentary bases/should be T-A/C-G ✓ (2)

**(9)**

2.2

2.2.1 a) Amino acids ✓ (1)  
b) Ribosome ✓ (1)

2.2.2 Proline ✓ Valine ✓ Serine ✓ Glycine ✓  
**(Order must be correct)** (4)

2.2.3 • Leucine ✓  
• would be coded for instead of Proline ✓  
• causing a different protein ✓ to be made (3)

2.2.4 • No, ✓  
• proteins consist of 50 or more amino acids bound in a polypeptide chain ✓ (2)

**(11)**

2.3

2.3.1 Pedigree ✓ diagram (1)

2.3.2 • Dominant means it only needs one defective/dominant allele for the disorder to be expressed in the phenotype / to have the disorder ✓  
• The allele for this disorder is found on the autosomes ✓ (2)

2.3.3 3 ✓ / three (1)

2.3.4  $\frac{3}{7} \checkmark \times 100 \checkmark = 42,86 \checkmark\%$  (3)

2.3.5 Parent 1: bb✓  
Parent 2: Bb✓ (2)

2.3.6 In order for her to have unaffected children, she must have a b/recessive✓ allele (2)  
**(10)**

2.4

2.4.1 Incomplete dominance✓ (1)

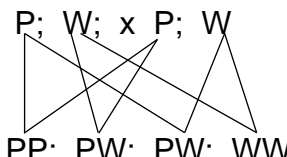
- 2.4.2
- Neither one of the two alleles of a gene is dominant✓ over the other,
  - resulting in an intermediate phenotype✓
  - in the heterozygous condition / heterozygote✓ (3)

2.4.3

✓ {

**P<sub>2</sub>/F<sub>1</sub>/parent:** Phenotype: pink pansies x pink pansies✓  
Genotype: PW x PW✓

✓ { **Meiosis**  
**Gametes:** P ; W ; P ; W ✓  
**Fertilisation**

P ; W ; x P ; W  
  
 PP; PW; PW; WW

**F<sub>2</sub>/offspring:** Genotype PP ; PW ; PW ; WW ✓  
Phenotype: 50%\*✓ pink (\*compulsory mark)  
**(1\*compulsory mark+ any 5)**

OR

**P<sub>2</sub>/F<sub>1</sub>/parent:**      **Phenotype:** pink pansies x pink pansies ✓  
                                  **Genotype:** PW x PW ✓

**Meiosis**  
                                  **Gametes:**            P ; W ; P ; W ✓  
                                  **Fertilisation**

Gametes	P	W
P	PP	PW
W	PW	WW

**1 mark for correct genotype**

**F<sub>2</sub>/offspring:**      **Phenotype:** 50%\* ✓ pink (\*compulsory mark)

(1\* compulsory mark + any 5) (6)

(10)

2.5

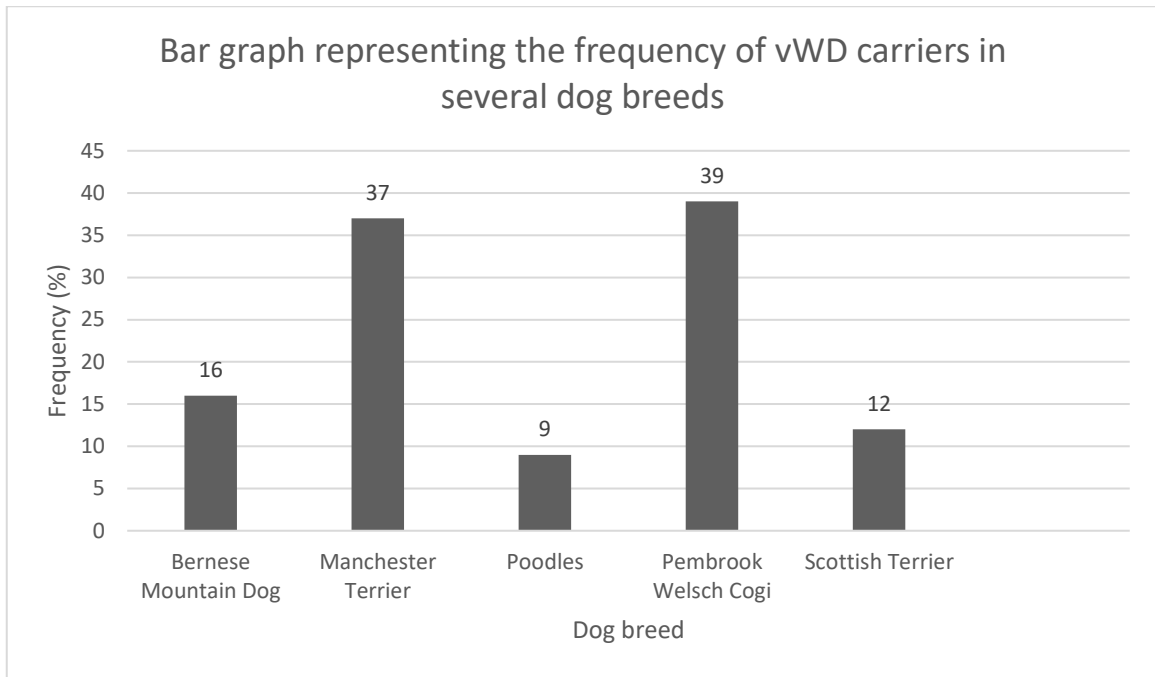
2.5.1 The allele that is masked and not visibly expressed in the phenotype of the heterozygous organism ✓✓

**OR**

The characteristic is only visible in the homozygous condition ✓✓ (2)

- 2.5.2
- To prevent two carrier dogs to breed/reproduce with each other ✓
  - and therefore prevent the birth of affected puppies ✓
- (2)

2.5.3



CRITERIA		ELLABORATION	MARK
Caption	<b>(C)</b>	Include both variables	1
Type	<b>(T)</b>	Bar graph with spaces	1
Labels	<b>(L)</b>	Label with unit on y-axis Dog breeds on x-axis	1
Scale	<b>(S)</b>	Scaling constant on y-axis, equal width of bars and equal spacing between bars	1
Bars	<b>(B)</b>	1-4 bars correct 5 bars correct	1 2

**If bars for affected dogs included; maximum one for bars**

(6)

(10)

[50]

**QUESTION 3**

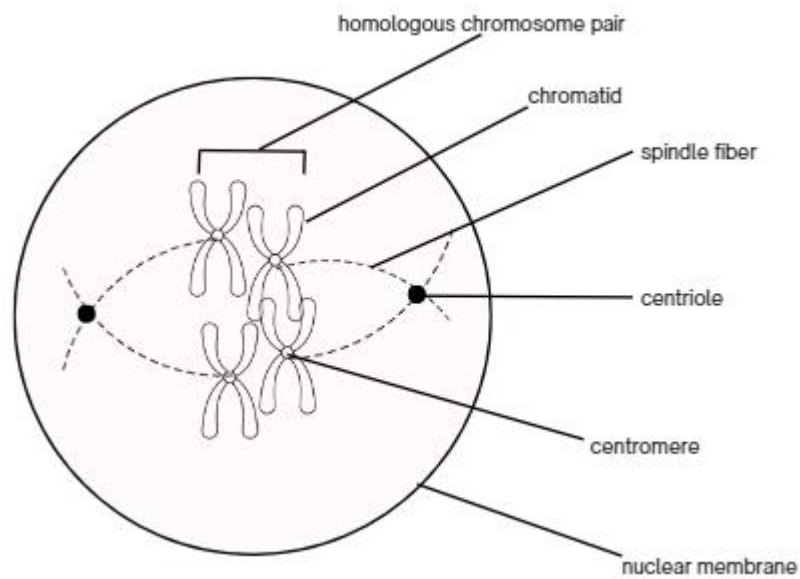
3.1

3.1.1 Telophase II ✓ (1)

3.1.2 • There are 4 cells ✓  
 • Each cell contains only a single set of un-replicated ✓/single stranded chromosomes (Mark first ONE only) (1)

3.1.3 No crossing over ✓ took place (1)

3.1.4 Metaphase I



CRITERIA		ELLABORATION	MARK
Heading	(H)	Metaphase I	1
Phase	(P)	Correct phase drawn	1
Chromosomes	(C)	4 chromosomes	1
Labels	(L)	Any TWO correct labels	2

(5)

(8)

3.2

3.2.1 Crossing over ✓ (1)

3.2.2 • Higher chance of genetically identical offspring ✓  
 • Less genetic variation in offspring (Mark first ONE only) (1)

3.2.3 Alleles ✓ for a specific characteristic (1)

- 3.2.4
- Adjacent chromatids of homologous chromosomes/chromosome from mom and chromosome from dad **AA/BB and aa/bb**✓\*
  - overlap✓
  - at the chiasma✓ where they touch
  - Chromatid segments✓ / genetic material is exchanged,✓
  - and a new recombinant chromosome pair **(AABb and aaBb)** ✓\* is formed **(AA/BB, aa/bb and AABb, aaBb)\* two compulsory marks and any TWO other)** (4)

(7)

3.3

- 3.3.1 a)
- Skull size✓ (2)
  - Brain volume✓ (1)
- b) Organisms✓/chimpanzee, *Australopithecine* and modern human (1)

- 3.3.2 The bigger the skull size, the bigger the brain volume✓✓  
**OR**  
 The smaller the skull size, the smaller brain volume✓✓  
**OR**  
 The size of the skull does not have an influence on the volume of the brain✓✓ (2)

- 3.3.3 a) The brain volume increased✓ over time (1)  
 b) The brow ridges became less prominent✓ over time (1)

3.3.4 *Homo habilis* (1)

(8)

3.4

- 3.4.1 **Continental drift took place✓\*/geographic barrier/sea**
- Leading to geographical isolation✓
  - Original population of marsupials was separated into two populations✓
  - There was no gene flow between the two populations✓
  - Each population was exposed to different environmental conditions✓
  - Natural selection occurred independently between the different populations✓
  - The populations were now genotypically and phenotypically different✓
  - Even if the different populations came into contact again✓
  - they will not be able to interbreed✓
- (1\* compulsory mark + any 6 other) (7)**

- 3.4.2 Biogeographical✓ distribution (1)
- 3.4.3 Fossil✓ evidence (1)
- (9)**
- 3.5
- 3.5.1 Group consisting of modern humans✓ and all their fossil ancestors✓ (2)
- 3.5.2 7✓✓/seven (2)
- 3.5.3
- *Homo ergaster*;✓
  - *Paranthropus robustus*;✓
  - *Paranthropus boisei*;✓
  - *Homo heidelbergensis*;✓
  - *Homo neanderthalensis*;✓
  - *Homo sapiens*✓
- (Any THREE) (Mark first THREE only) (3)**
- 3.5.4 *A. africanus*✓ and *A. sediba*✓ (2)
- 3.5.5 *A. africanus* – Raymond Dart✓/ Robert Broom  
*A. sediba* – Lee Berger✓  
**(Must be specified)** (2)
- (11)**
- 3.6
- 3.6.1 *Homo erectus*✓ (1)
- 3.6.2
- In **A** the foramen magnum/it is more backwards✓ in the skull for their
  - quadrupedal✓ movement.
  - In **C** the foramen magnum/it is more forward✓ in the skull
  - for bipedal movement✓ (4)
- 3.6.3
- Organisms **B** and **C** could cut/cook their food/meat/ or they included plants in their diet✓
  - therefore, large prominent canines were not required as in **A**✓ (2)
- (7)**

**TOTAL QUESTION 3: [50]**

**TOTAL SECTION B: [100]**

**GRAND TOTAL: [150]**