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KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

**PROVINCIAL STANDARDISED
ASSESSMENT**

GRADE 12

LIFE SCIENCES

JUNE 2026

MARKING GUIDELINES

MARKS: 150

This memorandum consists of 10 pages.



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Proudly South African



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.
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.



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SECTION A

QUESTION 1

- | | | | | |
|-----|--------|-----------------------------------|----------|-------------|
| 1.1 | 1.1.1 | D✓✓ | | |
| | 1.1.2 | A✓✓ | | |
| | 1.1.3 | B✓✓ | | |
| | 1.1.4 | D✓✓ | | |
| | 1.1.5 | D✓✓ | | |
| | 1.1.6 | C✓✓ | | |
| | 1.1.7 | D✓✓ | | |
| | 1.1.8 | C✓✓ | | |
| | 1.1.9 | D✓✓ | | |
| | 1.1.10 | A✓✓ | (10 x 2) | (20) |
| 1.2 | 1.2.1 | Gene✓ | | |
| | 1.2.2 | Follicle Stimulating Hormone✓/FSH | | |
| | 1.2.3 | Allantois✓ | | |
| | 1.2.4 | Oogenesis✓ | | |
| | 1.2.5 | Endometrium✓ | | |
| | 1.2.6 | Corpus luteum✓ | | |
| | 1.2.7 | Homeostasis✓ | | |
| | 1.2.8 | Corpus callosum✓ | | |
| | 1.2.9 | Blastocyst✓/Blastula | | |
| | 2.1.10 | Haploid✓ | (10 x 2) | (10) |
| 1.3 | 1.3.1 | A only✓✓ | | (2) |
| | 1.3.2 | A only✓✓ | | (2) |
| | 1.3.3 | A only✓✓ | | (2) |
| | | | | (6) |
| 1.4 | 1.4.1 | (a) Prostate gland✓ | | (1) |
| | | (b) Vas deferens✓ | | (1) |
| | | (c) Seminal vesicle✓ | | (1) |
| | 1.4.2 | D✓ - Testis✓ | | (2) |
| | 1.4.3 | C✓ - Urethra✓ | | (2) |
| | | | | (7) |
| 1.5 | 1.5.1 | 3✓ | | (1) |
| | 1.5.2 | (a) B✓ | | (1) |
| | | (b) ii✓ | | (1) |
| | | (c) - A }
- B }
- AB } | | (2) |
| | 1.5.3 | (a) 50✓% | | (1) |



(b) 25✓%

(1)

(7)

TOTAL SECTION A:**[50]****SECTION B****QUESTION 2**

2.1 2.1.1 (a) Ribosome✓ (1)

(b) mRNA✓ (1)

(c) Adenine✓/A (1)

2.1.2 Codon✓ (1)

2.1.3 (Strand) 2✓ (1)

2.1.4 - Makes up genes which carry hereditary information✓
 - Contains coded information for protein synthesis✓ (2)

(Mark the FIRST TWO only)

2.1.5 Transcription✓*
 - The double helix DNA unwinds✓
 - The double-stranded DNA unzips✓/weak hydrogen bonds break
 - to form two separate strands✓
 - One strand is used as a template✓
 - to form mRNA✓
 - using free RNA nucleotides from the nucleoplasm✓
 - The mRNA is complementary to the DNA✓
 - mRNA now has the coded message for protein synthesis✓
 *1 compulsory + any 5 (6)
(13)

2.2 2.2.1 (a) - Matching tissues✓ for organ transplant
 - Identifying relatives✓
 - Identifying dead bodies✓
 - Used for solving criminal cases✓
 - Diagnosing genetic disorders✓ Any (1)
(Mark the FIRST ONE only)

(b) - It is expensive✓
 - Human error could occur✓/mistakes during interpretation
 - Inaccurate since only a small piece of DNA sample is used✓
 - Evidence could be planted✓ to frame someone
 - Deliberate swapping of DNA samples✓
 - A person's DNA may be in the crime scene before the crime✓ Any (1)

(Mark the FIRST ONE only)**SA EXAM PAPERS**

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- (c) Every individual has a unique DNA✓/only identical twins share the same DNA (1)
- 2.2.2 - Some black bands of the child's DNA profile must match the mother's✓
 - and the remaining bands must match with the biological father's✓ (2)
(5)
- 2.3 2.3.1 (a) Graafian follicle✓/ovary (1)
- (b) Pituitary✓ gland (1)
- 2.3.2 (a) - High LH levels✓
 - stimulates ovulation✓
 - then the formation of corpus luteum✓
 - increasing progesterone level✓ Any (3)
- (b) - Low levels of oestrogen✓
 - causes the endometrium not to thicken✓
 - reducing the chances of implantation✓
 - Therefore no pregnancy Any (3)
(8)
- 2.4 2.4.1 (a) E✓ (1)
- (b) A✓ (1)
- 2.4.2 - Radial muscles contract✓
 - Circular muscles relax✓ (2)
- 2.4.3 - Blurred near vision✓
 - Eye strain✓
 - Holding reading material at a distance✓ Any (2)
- (Mark the FIRST TWO only)**
- 2.4.4 (a) - The lens becomes less convex✓
 - Refractive power decreases✓
 - resulting in blurred near objects✓/long-sightedness (3)
- (b) - light stimulus will not be converted into an impulse✓
 - no impulse will be sent to the cerebrum✓
 - resulting in blindness✓ Any (2)
(11)



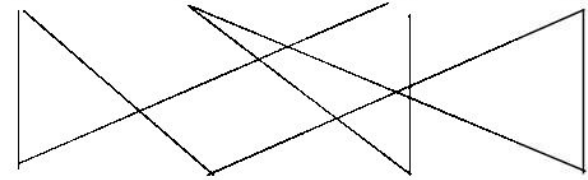
- 2.5 2.5.1 - Allows for a quick automatic response✓ to a stimulus
 - to minimise body injuries✓ (2)
- 2.5.2 - Heat receptors (on the skin) convert the stimulus into an impulse✓
 - which travels via the sensory neuron✓
 - through the interneuron in the spinal cord✓
 - Interneuron transmits the impulses to the motor neuron✓
 - which carries impulses to the hand/arm muscles✓
 - The muscles contract to pull away the hand✓ from the heat Any (5)
 (7)
- 2.6 - The pinna traps and directs sound waves into the auditory canal✓
 - Causing the tympanic membrane to vibrate✓ as sound waves strike it
 - The vibrations are transferred to the ossicles✓
 - The ossicles (hammer, anvil, stirrup) amplify and transmit vibrations to the oval window✓
 - Vibrations create pressure waves in the endolymph✓/fluid of the cochlea
 - The organ of Corti is stimulated✓
 - The stimulus is converted into a nerve impulse✓
 - The auditory nerve carries the impulse to the cerebrum✓ for interpretation Any (6)
 [50]

QUESTION 3

- 3.1 3.1.1 Karyotype✓ (1)
- 3.1.2 Homologous pair✓ of chromosomes (1)
- 3.1.3 - Same size✓
 - Same shape✓
 - Same position of centromeres✓
 - Genes on the same loci✓
 - Carry the same type of genes✓ Any (2)
 (Mark the FIRST TWO only)
- 3.1.4 45✓ (1)
- 3.1.5 (23rd pair) has XY chromosomes✓ (1)
 (Mark the FIRST ONE only)
- 3.1.6 (a) 18✓ (1)
 (b) 23✓ (1)
- 3.1.7 - Non-disjunction occurred in chromosome 18✓
 - During anaphase I✓/II
 - Resulting in a gamete with an extra chromosome✓/24 chromosomes
 - Which fused with a normal gamete✓ (with 23 chromosomes)
 - Resulting in a zygote with 47 chromosomes✓ Any (4)
 Proudly South African (12)

- 3.2 3.2.1 (a) GgLI✓✓ (2)
- (b) 9 Green body with Long arms: 3 Green body with short arms:
3 Blue body with Long arms: 1 Blue body with short arms✓✓ (2)
- 3.2.2 $\frac{3}{16} \} \times 100 \checkmark$
= 18,75✓% / 19% (3)
(7)
- 3.3 3.3.1 $X^hX^h \checkmark$ (1)
- 3.3.2 (a) - Energy levels will be low in affected✓ individuals
- due to low rate of cellular respiration✓
- as a result of reduced oxygen carrying capacity✓ (3)
- (b) - Female whales have 2 X-chromosomes✓
- therefore need to inherit 2 recessive alleles✓/ X^hX^h
- while males have one x-chromosome✓
- therefore needing to inherit just one recessive allele✓/ X^hY in order to be affected✓ Any (3)



3.3.3	P ₁ Phenotype	Male without sideroblastic anaemia	×	Female without sideroblastic anaemia✓
	Genotype	X^HY	×	X^HX^h ✓
	Meiosis			
	G/Gametes	X^H Y	×	X^H X^h ✓
	Fertilisation			
	F ₁			
	Genotype	X^HX^H X^HX^h	X^HY	X^hY ✓
	Phenotype	2 females without sideroblastic anaemia	Male without sideroblastic anaemia	Male with sideroblastic anaemia✓
	P ₁ and F ₁ ✓			
	Meiosis and fertilisation✓			
		25%✓*		

OR

P ₁ Phenotype	Male without sideroblastic anaemia	×	Female without sideroblastic anaemia✓
Genotype	X^HY	×	X^HX^h ✓
Meiosis			
Fertilisation			
F ₁			
Phenotype			
P ₁ and F ₁ ✓			
Meiosis and fertilisation✓			
	25%✓*		

Male without sideroblastic anaemia	Female without sideroblastic anaemia		
	Gametes	X^H	X^h
	X^H	X^HX^H	X^HX^h
	Y	X^HY	X^hY

Phenotype	2 females without sideroblastic	Male without sideroblastic	Male with sideroblastic✓
P ₁ and F ₁ ✓			
Meiosis and fertilisation✓			
	(correct gametes)		
	✓ (correct genotype)		

25%✓*

*1 compulsory + Any

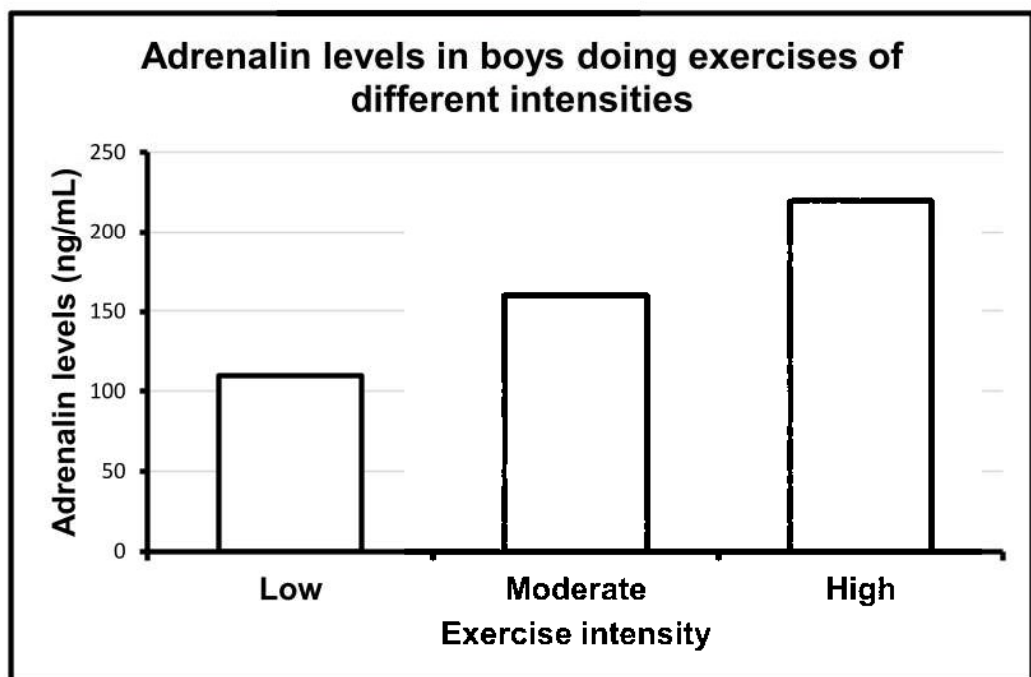
(6)
(14)

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- 3.4 3.4.1 (a) Adrenalin levels✓ (1)
- (b) Exercise intensity✓ (1)
- 3.4.2 (a) - Ask permission from participants
 - Decide on the sample size✓
 - Decide on the time, date and venue✓
 - Decide on the type and duration of exercise for each group✓
 - Decide on the measuring tool✓/method Any (2)
(Mark the FIRST TWO only)
- (b) - Diet✓
 - The person measuring adrenalin✓
 - Duration of rest between exercises✓
 - Blood samples must be collected at the same time of the day
(Mark the FIRST TWO only) Any (2)
- (c) - 10 boys in each group participated✓/ 30 boys participated
 - Exercise was done for 5 consecutive days✓
 - Average adrenalin level was calculated✓ Any (2)
(Mark the FIRST TWO only)
- 3.4.3 - To obtain a baseline✓
 - to verify that the change in adrenalin levels are due to exercise✓ Any (2)
- 3.4.4 The increase in exercise intensity increases adrenalin levels in the body✓✓ (2)

3.4.5



Criteria	Elaboration	Mark
Correct type of graph (T)	Bar graph drawn	1
Caption of graph (C)	Both variables included	1
Axes labels (L)	X- and Y-axis correctly labelled and correct unit for both axes	1
Scale for X- and Y-axes (S)	X-axis - equal width of bars & spaces between bars Y-axis – correct scale	1
Plotting (P)	1 to 2 bars plotted correctly All three bars plotted correctly	1 2

If a histogram or line graph is drawn, marks will be lost for:

- Type of graph and scale

If axes are transposed:

- Can get all marks if labels are also swapped and points correlate with axes
- If labels are not corresponding with axes, then:
 - Marks will be lost for labels and scale
 - Plotting can get credit if the bars are correct for given labels

(6)
(18)
[50]

TOTAL SECTION B: 100
GRAND TOTAL: 150



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