



JUNE EXAMINATION GRADE 12

2024

MARKING GUIDELINES

LIFE SCIENCES

14 pages

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PRINCIPLES RELATING TO THE MARKING OF LIFE SCIENCES

- 1. If more information than marks allocated is given Stop marking when maximum marks are reached and place a wavy line and 'max' in the right-hand margin.
- 2. **If, for example, three reasons are required and five are given** Mark only 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 are given in terminology

Accept, provided it was accepted at the 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. Marking guidelines 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.

19. Changes to the marking guidelines

No changes must be made to the marking guidelines without consulting the provincial internal moderator.



GR12 0624

AMENDMENT TO MARKING GUIDELINES JUNE 2024 PROVINCIAL EXAMINATION

ATTENTION

THE CHIEF INVIGILATOR

SUBJECT / VAK	LIFE SCIENCES /		
	LEWENSWETENSKAPPE		
DATE OF EXAMINATION	5 JUNE / <i>JUNIE</i> 2024		

The errata for the Marking Guidelines of LIFE SCIENCES has reference.

There are notes to the marking guidelines which appear at the end of this document. These matters were addressed at the Marking Standardisation Meeting.

To ensure that candidates are not disadvantaged nor prejudiced in way, you are advised to please mark the paper out of 148 marks instead of 150 and then the learners' marks must be converted to a mark out of 150. E.g., Should a learner attain 85/148 then that mark is recalculated as 86/150.

Use the formula: $\frac{a}{148} \times 100 = b$. Then, $\frac{b}{100} \times 150 = c$

C is the mark that is entered into SASAMS out of 150.

H. Mlu Mr. Jonathan Williams

DIRECTOR: EXAMINATIONS MANAGEMENT 5 JUNE 2024



SECTION A

QUESTION 1

- 1.1 1.1.1 D √√
 - 1.1.2 C √ √
 - 1.1.3 B √ √
 - 1.1.4 B √ √
 - 1.1.5 C √ √
 - 1.1.6 D √ √
 - 1.1.7 A ✓ ✓
 - 1.1.8 D √ √
 - 1.1.9 C ✓ ✓
 - 1.1.10 A ✓✓
- 1.2 1.2.1 Implantation √/choronic villi
 - 1.2.2 Biotechnology ✓
 - 1.2.3 Co-dominance ✓
 - 1.2.4 Chiasma √/Chiasmata
 - 1.2.5 Pedigree√ diagram
 - 1.2.6 Pupillary mechanism ✓
 - 1.2.7 Eustachian tube ✓
 - 1.2.8 Corpus callosum \checkmark (8 x 1) (8)
- 1.3 1.3.1 A only √√
 - 1.3.2 None √ √
 - 1.3.3 Both A and B $\checkmark \checkmark$
 - 1.3.4 Both A and B $\checkmark \checkmark$



(10 x 2)

(20)

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		TOTAL SECTION A:	48
	1.5.5	Parasympathetic ✓ nervous system	(1) (6)
	1.5.4	To increase energy ✓/more ATP production	(1)
	1.5.3	Cellular respiration ✓	(1)
	1.5.2	QUESTION REMOVED, the paper will be marked out of 148	(2)
1.5	1.5.1	 (a) Pupil dilates ✓ (b) Beats faster ✓/increases heart rate (c) Coverts stored glycogen into glucose ✓ 	(1) (1) (1)
			(6)
	1.4.3	 Well developed body√ Young born with eyes open√/able to see, covered in (down) feathers √, mobile ✓ when born. 	(2)
	1.4.2	(a) $B \checkmark$ (b) $C \checkmark$ (c) $A \checkmark$	(3)
1.4	1.4.1	Ovipary ✓	(1)



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SECTION B

QUESTION 2

2.1	2.1.1	Progesterone ✓	(1)
	2.1.2	 Endometrium/placenta will not be maintained ✓ therefore it will disintegrate/breakdown ✓ It could also cause contractions ✓ resulting in a possible miscarriage ✓ 	(2)
	2.1.3	$B \checkmark - Umbilical cord \checkmark$	(2)
	2.1.4	 There is less fluid * ✓ A constant temperature would not be maintained. ✓ There would no/less shock absorption. ✓ There would be increased chance of mechanical injury. ✓ The foetus could dehydrate/desiccate. ✓ Movement of the foetus would be limited ✓/cause more friction Any 3 + 1 compulsory mark * 	(4) (9)
2.2	2.2.1	LH ✓/Lutenising hormone	(1)
	2.2.2	 Causes ovulation √/releasing of ovum from (graafian) follicle Causes formation of the corpus luteum √ 	(2)
	2.2.3	Oestrogen ✓ Stimulates production of LH ✓/responsible for the development of secondary characteristics	(2)
	2.2.4	 Graafian/developing follicle ✓ matures and produces oestrogen ✓ 	
		 The corpus luteum ✓ is formed which produces progesterone ✓ 	(4) (9)



∠.4	2.4.1	Normal eye	Cataract eye	
0.4	0.4.4			(11)
	2.3.7	 (a) Dentrites ✓ (b) Axon ✓ 		(1) (1)
	2.3.6	 Synapse allows for impulses neuron to another √/prevents (Synapse loss in the) cerebro 	to travel in one direction from one s continuous stimulation of the neurons Im ✓ will lead to Alzheimer's symptoms.	(2)
	2.3.5	C√		(1)
	2.3.4	 Loss of memory ✓ Confusion ✓ Poor judgment ✓ Trouble understanding visual Difficulty with language ✓ Issues with social behavior ✓ (Mark first TWO only) 	images ✓	(2)
	2.3.3	Myelin sheath \checkmark provides insulation \checkmark to neurons	/speeds up transmission of impulses	(2)
	2.3.2	Motor ✓ neuron		(1)
2.3	2.3.1	 Brain tissue is generally shrue Abnormal levels of a naturally form Amyloid plaques ✓ that Synaptic loss ✓ (Mark first ONE only) 	nken ✓ occurring protein clumps together to collect between neurons	(1)

	Normal eye		Cataract eye
-	lens is clear ✓	I	lens is cloudy ✓
-	Light refracted onto yellow spot of retina √/light rays converge	-	Light refracted to many parts of the retina ✓/light rays scatter in many directions

Table (T): Columns with headings \checkmark

Surgery√ 2.4.2

- Accommodation* ✓ to near vision 2.4.3

- Ciliary muscles contract \checkmark
- suspensory ligaments slacken ✓
- tension in lens decreases ✓
- lens becomes more convex ✓
- refractive power increases \checkmark
- a clear image is focused on the retina \checkmark

Any 4 + 1 complusory mark* (5) (11)



(5)

(1)

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2.5	2.5.1	(a) (b)	Type of underwear worn ✓/tightness of underwear Sperm count ✓	(2)
	2.5.2	Use r	more than 5 men ✓	(1)
	2.5.3	- Tes - cau - spe - spe	stes are close to the body ✓ uses an increase in temperature ✓/above optimal/above 35 °C erm denatures ✓/not healthy erm count decreases ✓ (Any 3)	(3)
	2.5.4	- To - The	get the baseline \checkmark /normal levels ese are used to compare \checkmark with when tight-fitting underwear is used	(2)
	2.5.5	The a fitting	amount of sperm produced/sperm count while the men wore the tight- underwear $\checkmark \checkmark$	(2) (10) [50]
QUE	STION 3			
3.1	3.1.1	Prote	in synthesis ✓	(1)
	3.1.2	A – T B – T	ranscription ✓ ranslation ✓	(2)
	3.1.3	- It is - carr - to th - whe	tRNA ✓ ies a specific/required amino acid✓ ne ribosome ✓ en the anticodon on the tRNA matches the codon of the mRNA ✓ (Apy 2)	(2)
	211		(Ally 3)	(3)
	3.1.4	(a) (b)	$E - Proline \checkmark$	(1)
	215	CGG	r = 111e01111e +	(2)
	5.1.5	000		(2)
	3.1.6	(a) (b)	 Gene ✓ mutation Codon GCC (on the mRNA) changed to GCA ✓ Anticodon CGG (on tRNA) changed to CGU ✓ Both anticodons GCA and CGU code for Alanine ✓/the same amino acid so the protein will not change. ✓/No effect 	(1)
				(16)



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3.2	3.2.1	A – Homologous chromosomes ✓ B – Spindle fibre ✓				
	3.2.2	 (a) Metaphase 1 √ (b) Homologous pairs of chromosomes are arranged at the equator √ √ 	(1) (2)			
	3.2.3	 Crossing over √* Pairs of homologous chromosomes lie next to each other ✓ Chromatids from each homologous chromosomes overlap ✓ The point/s of crossing over are called chiasma ✓/chiasmata Chromatid segments break off and are exchanged ✓/exchange of genetic material ANY 3 + 1* Compulsory 	(4)			
	3.2.4	Crossing over ensures increase in genetic variation \checkmark /diversity (in gametes/offspring)	(1)			
	3.2.5	23 ✓	(1)			
	3.2.6	 Non-disjunction ✓ occurred/Chromosome pair/(chromatids) did not separate properly During anaphase√ 	(2) (13)			
3.3	3.3.1	(8 + 5 + 3 + 8) : (0 + 3 + 3 + 2) √/24 : 8 3 : 1 √	(2)			
	3.3.2	The parents (P ₁) were black and brown mice \checkmark /homozygous with contrasting characteristics The offspring (F ₁) generation were all black mice \checkmark	(2)			





OR



Criteria	Mark allocation
Bar graph drawn (T)	1
Caption of graph (C)	
Includes number of mice, colour AND breeding	1
pairs	
Correct labels on X-axis and Y-axis (L)	1
Correct scale for Y-axis AND Equal spaces between	
bars and equal width of bars for X-axis (S)	1
Plotting (P) :	
1 to 7 coordinates are plotted correctly	1
ONLY 8 correct coordinates are plotted	2





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3.4	3.4.1	Alleles are different f	forms/versior	ns of a g	ene √			(1)
	3.4.2	Chromosomal ✓ mu	tations					(1)
	3.4.3	P1 Phenotype: Wild ty Genotype <i>Meiosis</i> G/Gametes <i>Fertilisation</i>	/pe/grey stripe Gg G, g	ed x Wild x x	type/gr Gg G,	ey striped √ ✓ g ✓		
		F1 Genotype	GG	Gg	Gg	gg ✓		
		Phenotype: 3 with V 25%*✓ chance P₁ and F₁ ✓	Vild type/grey of having an	striped b ebony b	body: 1 body	1 ebony/dark	body ✓	
		Meiosis and fertilisat	tion ✓			¹ Compuls	sory + Any 5	
		P 1		OR				
	Phenotype: Wild type/grey striped x Wild type/grey striped \checkmark							
		Genotype	Gg	х	G	g√		
		Meiosis	Gamete	G		g Ga		
		Fertilisation	g 1 mark for co 1 mark for co	Gg orrect ga	imetes	99 99 √ ∋s √		
	F ₁ Phenotype: 3 with Wild type/grey striped body: 1 ebony/dark body \checkmark							
		25% *✓ chance	e of having ar	n ebony	body			
		P_1 and $F_1 \checkmark$						
		Meiosis and fertilisat	tion 🗸			* 1 Compu	Ilsory + Any 5	(6)
	3.4.4	Dihybrid ✓ cross						(1)
	3.4.5	Wild type/grey stripe	ed body colou	ır	vestig	ial/short wing	j ✓	(2) (11) [50]
						ΤΟΤΑΙ	SECTION B:	100
\ A /							TOTAL:	148



Additional notes to the marking of Gauteng June 2024

1.1. If the learner gave more than one answer, they will get no marks e.g. 1.1.2 C/D XX

1.2.2 Biotechnology is the "umbrella" term and has different forms including genetic engineering, DNA profiling, stem cells, cloning etc. We are only accepting the term and not the examples of it.

1.2.6 Accept "pupil reflex" even though it's not in the examination guideline.

1.3.3/4 accept Both $\checkmark \checkmark$ A and B $\checkmark \checkmark$ A, B $\checkmark \checkmark$ but not A/B XX

1.5.1 Accept pupil widens \checkmark OR increases in diameter \checkmark . No mark for pupil becomes bigger or larger \checkmark etc.

1.5.2 Has been removed and will not be marked, the total of the paper is 148.

1.5.3 MUST be cellular respiration (BOTH WORDS) no marks for respiration alone as it is often used to refer to breathing.

2.1.2 Endometrium will not be thick enough can be read into the first bullet.

2.2.4 Learners must specify developing/graafian/growing follicle, NO mark for Follicle alone.

Learners can get the marks for hormone names alone. No mark for the origin without linking it to the correct hormone.

2.3.3. Accept Neurilemma√

Responsible for the repair of damaged neurons \checkmark

• NOTE Knowledge of the Neurilemma is not required based on the examination guidelines.

2.4.3. Bullet 5, we can accept lens becomes more round \checkmark

NO mark for lens becomes round

2.5.1 Tight underwear X

Use of loose fitting and tight fitting underwear \checkmark

2.5.4 This is not the control. It is the starting point/baseline. A control is an experiment done in addition the actual experiment but with the independent variable is excluded.

3.1.3 Learner who discusses both transcription and translation in separate paragraphs, will lose all marks as the first paragraph will be marked. Where one long response is given, apply principle 3 and award marks for the correct portions.

3.1.6 a) Accept point mutation (Please note this is no longer in the examination guidelines)

3.2.2 b) Bivalents cannot be used in place of homologous chromosomes.



3.2.6 Second bullet: accept Anaphase \checkmark , Anaphase $2\checkmark$ or Anaphase 1 or/and $2\checkmark$ BUT NO MARK for anaphase 1

3.3.3 Mark each criterion independently of the others. No double penalization for the same error.

If a learner separated the bars (not as a double bar graph) they will not be penalized.

If bars of P1/F1 generation are included a maximum of 1 mark can be awarded for plotting.

3.4.5 Learner must mention the characteristic and its specific variant to get the mark.

NO mark for grey/ wild alone without body colour being mentioned. NO mark for vestigial/ short alone without wing being mentioned.

