



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES P1

EXEMPLAR 2014

MEMORANDUM

MARKS: 150

This memorandum 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 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.

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 memorandum

No changes must be made to the memoranda without consulting the provincial internal moderator who in turn will consult with the national internal moderator (and the Umalusi moderators where necessary).

20. Official memoranda

Only memoranda bearing the signatures of the national internal moderator and the Umalusi moderators and distributed by the National Department of Basic Education via the provinces must be used.

SECTION A

QUESTION 1

1.1	1.1.1	D✓✓		
	1.1.2	A✓✓		
	1.1.3	A✓✓		
	1.1.4	C✓✓		
	1.1.5	D✓✓		
	1.1.6	B✓✓		
	1.1.7	B✓✓		
	1.1.8	B✓✓		
	1.1.9	B✓✓		
			(9 x 2)	(18)
1.2	1.2.1	Gestation✓		
	1.2.2	Diabetes mellitus✓		
	1.2.3	Eustachian✓ tube		
	1.2.4	Eutrophication✓		
	1.2.5	Blastocyst✓		
	1.2.6	Acrosome✓		
	1.2.7	Prostate✓		
	1.2.8	Sperm duct✓/vas deferens		
	1.2.9	Oogenesis✓	(9 x 1)	(9)
1.3	1.3.1	A only ✓✓		
	1.3.2	None ✓✓		
	1.3.3	Both A and B ✓✓		
	1.3.4	B only✓✓		
	1.3.5	Both A and B✓✓		
	1.3.6	Both A and B✓✓	(6 x 2)	(12)
1.4	1.4.1	C✓		(1)
	1.4.2	B✓		(1)
	1.4.3	A✓		(1)
	1.4.4	A✓		(1)
	1.4.5	B✓		(1)
				(5)
1.5	1.5.1	A – 46✓		
		B – 23✓		
		C – 46✓		(3)
	1.5.2	Zygote✓		(1)
	1.5.3	Stages 1 and 2✓		(1)
	1.5.4	Stages 3 and 4✓		(1)
				(6)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

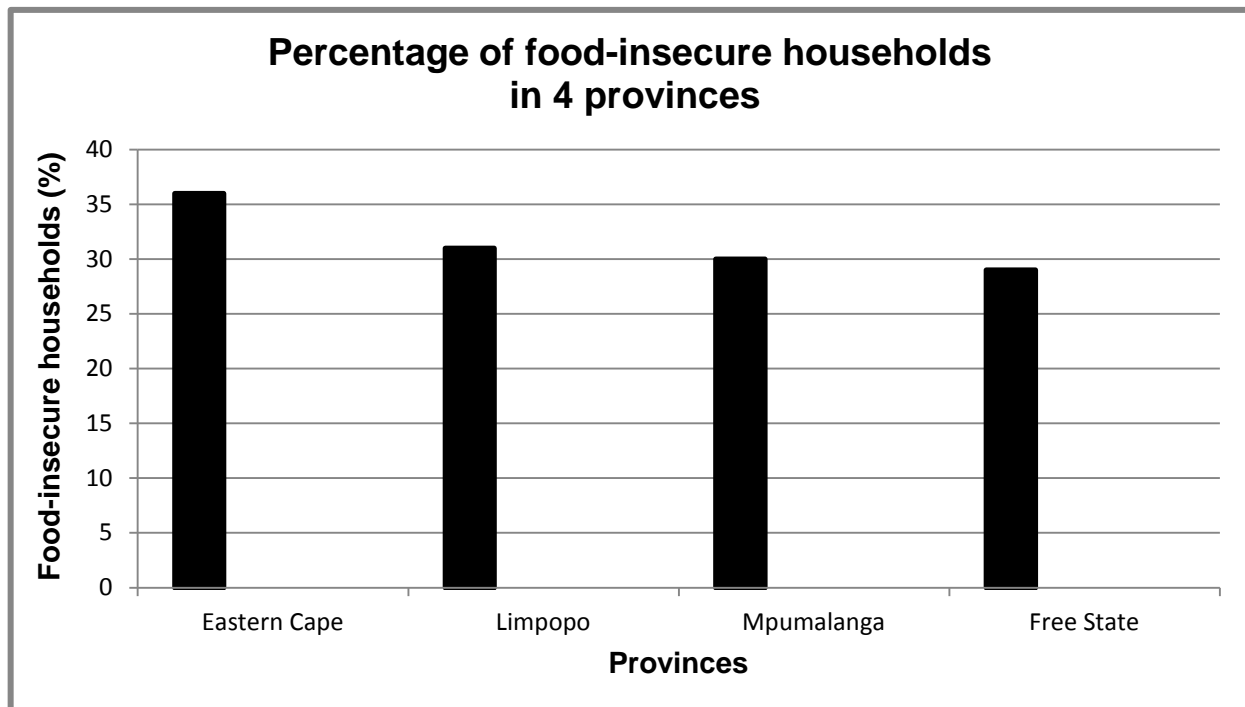
- | | | | |
|-----|-------|---------------------------------------------------------------------------------------------|-------------|
| 2.1 | 2.1.1 | (a) Grey matter✓ | (1) |
| | | (b) Interneuron✓/connector neuron | (1) |
| | 2.1.2 | (a) A✓ | (1) |
| | | (b) C✓ | (1) |
| | 2.1.3 | Sensation would be felt✓
but there would be no response✓ | (2) |
| | 2.1.4 | $1,5 \text{ m} \div 75 \text{ m.s}^{-1}$ ✓
$= 0,02 \text{ s}$ ✓ | (3) |
| | 2.1.5 | Helps to protect the body✓by reacting quickly✓ | (2) |
| | | | (11) |
| 2.2 | 2.2.1 | 0,42 seconds✓ | (1) |
| | 2.2.2 | – It decreased first✓
– then levelled off✓
– and finally increased again.✓ | (3) |
| | 2.2.3 | Practice makes reaction time faster✓
but later, tiredness slows down the reaction time.✓ | (2) |
| | 2.2.4 | Light✓ | (1) |
| | 2.2.5 | Reaction time would probably increase✓ | (1) |
| | | | (8) |
| 2.3 | 2.3.1 | (a) B✓✓ | (2) |
| | | (b) C✓✓ | (2) |
| | 2.3.2 | Accommodation✓ | (1) |
| | | – Ciliary muscles contract✓ | |
| | | – Suspensory ligaments slacken✓ | |
| | | – Tension on lens decreases✓ | |
| | | – Lens becomes more convex✓ | |
| | | – Refractive power of lens increases✓ | |
| | | – A clear image now forms on the retina | (any 4) |
| | | | (5) |
| | | | (9) |

- | | | | |
|-----|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| 2.4 | 2.4.1 | Growth of plant shoots✓ | (1) |
| | 2.4.2 | <ul style="list-style-type: none"> – Same environment in which the shoots are placed✓ – Same type of shoot used✓ (Mark first TWO only) | (2) |
| | 2.4.3 | Auxins✓ | (1) |
| | 2.4.4 | In investigation A: <ul style="list-style-type: none"> – Light from the right✓ – caused auxins to move to shaded side of the shoot✓ – leading to increased cell elongation and division✓ – There was therefore greater growth on the shaded side✓ – thus bending the shoot in the direction of the source of light✓ <div style="text-align: right;">(any 4)</div>
In investigation C: <ul style="list-style-type: none"> – Light has no influence on the distribution of auxins✓ – therefore the shoot grew upright✓ | (2) (6) |
| | 2.4.5 | <ul style="list-style-type: none"> – Repeat the investigation✓ – Use more than one plant for each treatment✓ (Mark first TWO only) | (2)
(12)
[40] |

QUESTION 3

- 3.1 3.1.1 Pituitary gland/hypophysis✓ (1)
- 3.1.2 B – TSH/thyroid-stimulating hormone✓ (1)
- 3.1.3 – Controls metabolism✓
 – Influences heart rate✓
 – Influences functioning of central nervous system✓
 (Mark first TWO only) (any 2) (2)
- 3.1.4 – High levels of thyroxin is detected✓by the hypophysis
 – which leads to a decrease✓
 – in the secretion of TSH✓
 – Activity of thyroid is slowed down✓ /less thyroxin produced
 – Thyroxin level drops✓ to normal (5)
 (9)
- 3.2 3.2.1 A – Sweat pore✓
 B – Sweat gland✓
 C – Blood vessel✓ (3)
- 3.2.2 – Impulses sent from hypothalamus✓to C (blood vessels)
 – Blood vessels dilate✓/vasodilation occurs
 – More blood carrying heat comes to the skin surface✓
 – and therefore more heat is lost from the body✓ (any 3)
- B (Sweat glands) produce more sweat✓
 – When sweat evaporates from the skin surface ✓
 – More heat is lost from the skin✓
 – leading to a drop in the body temperature✓ (any 3) (6)
 (9)

- 3.3 3.3.1 Having access to enough food✓on a daily basis, so as to ensure healthy living✓ (2)
- 3.3.2



Mark allocation for the graph

Criterion	Elaboration	Mark
Type of graph	Bar graph drawn	1
Data used	Graph drawn for four provinces only (EC, LIM, MPU and FS)	1
Caption	Includes both variables: 'Provinces' and 'Percentage food-insecure households'	1
X-axis	Appropriate width of bars and intervals between bars AND Correct label: Provinces	1
Y-axis	Appropriate scale AND Correct label and unit: Food-insecure households (%)	1
Plotting of points	1–3 bars plotted correctly – 1 mark All 4 bars plotted correctly – 2 marks	2

(7)

- 3.3.3 (a) Fertilisers provide nutrients that increase crop growth✓ (1)
- (b) Fertilisers are expensive – causes food prices to increase✓/
over-use of fertilisers can cause oxygen deprivation in soil
which will eventually reduce crop production (1)
- 3.3.4 (a) Pesticides ensure that pests do not cause large-scale damage
to crops✓ (1)
- (b) Pesticides could kill pests as well as their predators – hence
more pesticides would have to be used, raising the cost of
food✓ (1)
- 3.3.5 – Massive unemployment in the country✓
– Increase in the size of the human population✓
– Farms destroyed for development✓
– Decrease in subsistence farming ✓
– Prolonged unfavourable environmental conditions✓
(Mark first TWO only) (any 2 x 1) (2)
(15)
- 3.4 3.4.1 – There will be less trees✓
– so less carbon dioxide will be used from the atmosphere for
photosynthesis✓ (2)
- 3.4.2 – Can lead to the loss of biodiversity✓/habitat destruction/soil
erosion
(Mark first ONE only) (1)
- 3.4.3 – Increased carbon dioxide levels lead to the enhanced
greenhouse effect✓
– which causes an increase in the global temperatures✓
– This could lead to rise in sea levels because of melting ice✓/
floods/change in climate
– which can lead to the extinction of some organisms✓. (any 3) (3)
- 3.4.4 Use alternate sources of energy✓
(Mark first ONE only) (1)
(7)
[40]

TOTAL SECTION B: 80

SECTION C

QUESTION 4

Testosterone✓

Produced by seminiferous tubules✓ in the testes

During puberty testosterone stimulates:

- The deepening of the voice as vocal cords elongate in the larynx✓
- The development of muscles✓
- The growth of facial, pubic and body hair✓
- Development of the penis and testes✓
- The production of sperm in the testes✓

max (5)

Oestrogen✓

Produced by the Graafian follicles✓ in the ovaries

- Causes the lining of the uterus✓/endometrium
- to become thicker/more vascular ✓
- in preparation for a possible implantation of the embryo and development of the foetus✓

During puberty oestrogen stimulates:

- The widening of the pelvis/hips✓
- The growth and development of the breasts✓
- The growth of the female sex organs✓
- The start of the menstrual cycle, ovulation and menstruation✓

max (7)

Progesterone✓

Produced by the corpus luteum✓ and placenta✓

- Progesterone causes further thickening of the endometrium✓
- so that it is ready for implantation of the embryo should fertilisation occur✓
- High levels of progesterone✓
- inhibits the secretion of FSH✓
- by the pituitary gland✓
- which in turn prevents the further development of any new ovum in the ovary✓

max (5)

Content (17)
Synthesis (3)
(20)

ASSESSING THE PRESENTATION OF THE ESSAY

Criterion	Elaboration	Mark
Relevance	No other hormones except testosterone, oestrogen and progesterone are mentioned.	1
Logical sequence	Each hormone named is linked to its correct role.	1
Comprehensive	All THREE correct hormones mentioned with at least THREE roles described for each hormone.	1

TOTAL SECTION C: 20
GRAND TOTAL: 150