



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)

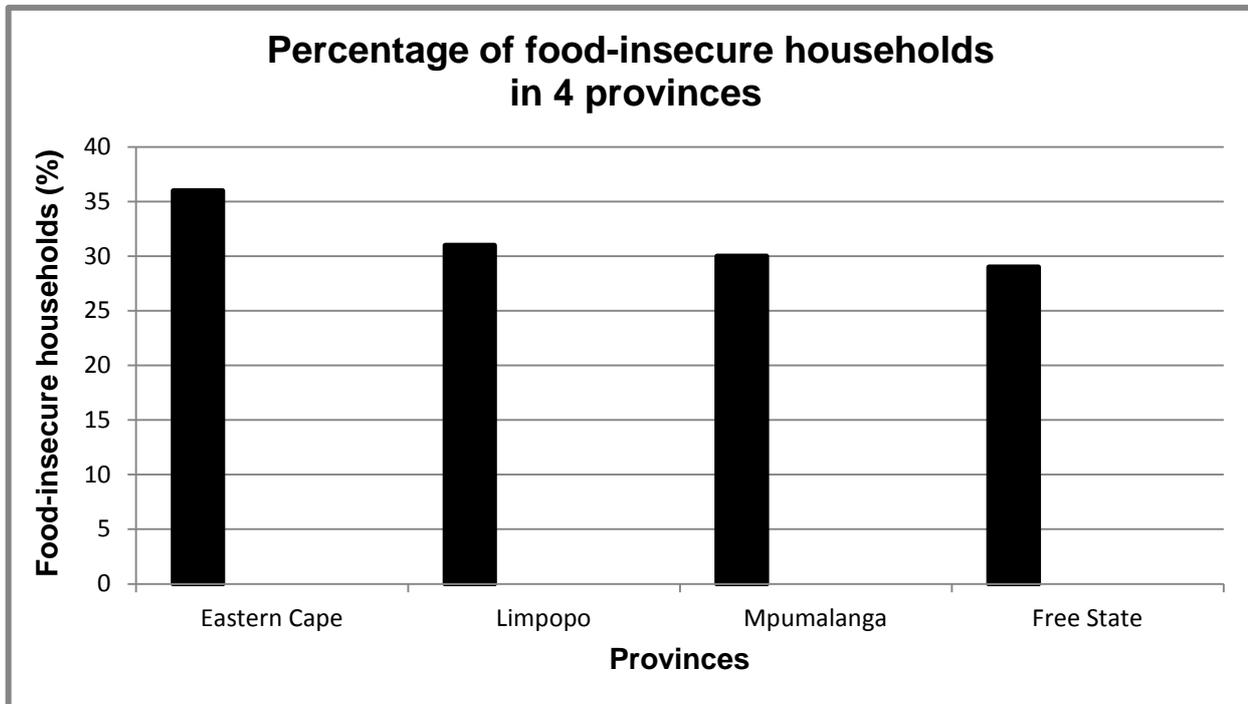
- 2.4 2.4.1 Growth of plant shoots✓ (1)
- 2.4.2 – Same environment in which the shoots are placed✓
– Same type of shoot used✓
(Mark first TWO only) (2)
- 2.4.3 Auxins✓ (1)
- 2.4.4 **In investigation A:**
– Light from the right✓
– caused auxins to move to shaded side of the shoot✓
– leading to increased 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✓
(any 4)
- In investigation C:**
– Light has no influence on the distribution of auxins✓
– therefore the shoot grew upright✓ (2) (6)
- 2.4.5 – 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