basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES P2

FEBRUARY/MARCH 2014

MEMORANDUM

MARKS: 150

This memorandum consists of 10 pages.

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PRINCIPLES RELATED TO MARKING LIFE SCIENCES 2014

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 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 national memo discussion meeting.

14. **If only letter is asked for and only name is given (and vice versa)**
    No credit.

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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 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 memoranda without consulting the provincial internal moderator who in turn will consult with the national internal moderator (and the external moderators where necessary)

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

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SECTION A

QUESTION 1

1.1	1.1.1	D✓✓		
	1.1.2	B✓✓		
	1.1.3	B✓✓		
	1.1.4	B✓✓		
	1.1.5	D✓✓		
	1.1.6	C✓✓		
	1.1.7	B✓✓		
	1.1.8	A✓✓		
	1.1.9	C✓✓		
	1.1.10	B✓✓	(10 x 2)	**(20)**
1.2	1.2.1	Homeostasis✓		
	1.2.2	Pollination✓		
	1.2.3	Asexual reproduction✓		
	1.2.4	Reproductive isolating mechanisms✓		
	1.2.5	Incomplete metamorphosis✓		
	1.2.6	Sensory✓/Afferent		**(6)**
1.3	1.3.1	B only✓✓		
	1.3.2	Both A and B✓✓		
	1.3.3	A only✓✓		
	1.3.4	A only✓✓		
	1.3.5	Both A and B ✓✓		
	1.3.6	None✓✓		
	1.3.7	Both A and B✓✓		
	1.3.8	B only✓✓	(8 x 2)	**(16)**
1.4	1.4.1	B✓ Urethra✓		(2)
	1.4.2	E ✓ Fallopian tube ✓/oviduct		(2)
	1.4.3	C✓ Testis✓		(2)
	1.4.4	F✓ Ovary ✓		(2)
				(8)
				[50]

TOTAL SECTION A: 50

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SECTION B

QUESTION 2

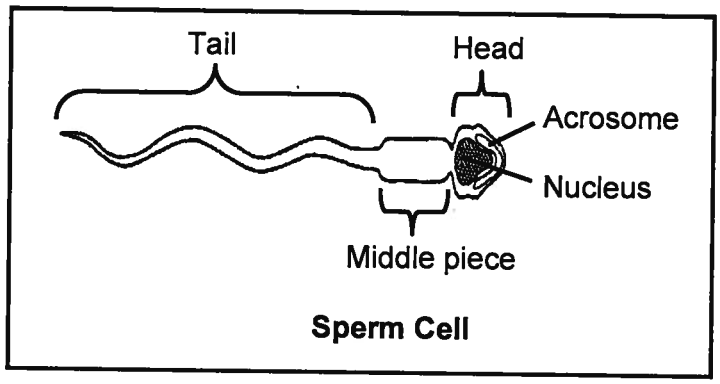
2.1 2.1.1 Spermatogenesis✓ (1)

2.1.2 Testosterone ✓ (1)

2.1.3 Stimulates the development of primary male sex organs✓
Stimulates the development of secondary male characteristics✓
Stimulates development of sperm✓ Any (1)

2.1.4 (a) 46 chromosome✓ (1)
(b) 23 chromosome ✓ (1)

2.1.5



Sperm Cell

Mark allocation for diagram:
Caption✓
Any 4 correct labels✓✓✓✓ (5)
(10)

2.2 2.2.1 1,6 ✓✓ °C (2)

2.2.2 **Increase in temperature when exercise starts:**
- Due to exercise✓
- the body temperature increased ✓/from 36,8 °C to 38,2 °C
- because of heat✓ produced
- from an increase in the rate of cellular respiration✓
- to meet the energy demands✓ during exercise Any (3)

Decrease in body temperature when exercise ends:
- The temperature decreased✓/from 38,2 °C back to 36,8 °C after the exercise
- when the heat-regulating centre in the brain✓/hypothalamus was stimulated by the increased temperature
- causing the blood vessels of the skin to dilate✓/vasodilation
- allowing more blood flow through the skin✓
- resulting in greater heat loss✓
- Also more sweat evaporates✓ from the skin surface
- cooling down✓ the skin Any (5)
(10)

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2.3 2.3.1 Have photoreceptors✓/rods and cones
to convert light stimuli into impulses✓ (2)

2.3.2 The iris contains 2 sets of muscles✓
The radial muscles contract✓
and the circular muscles relax ✓
causing the pupil to dilate✓
allowing more light to enter the eye✓
to form a clear image✓ Any (5)

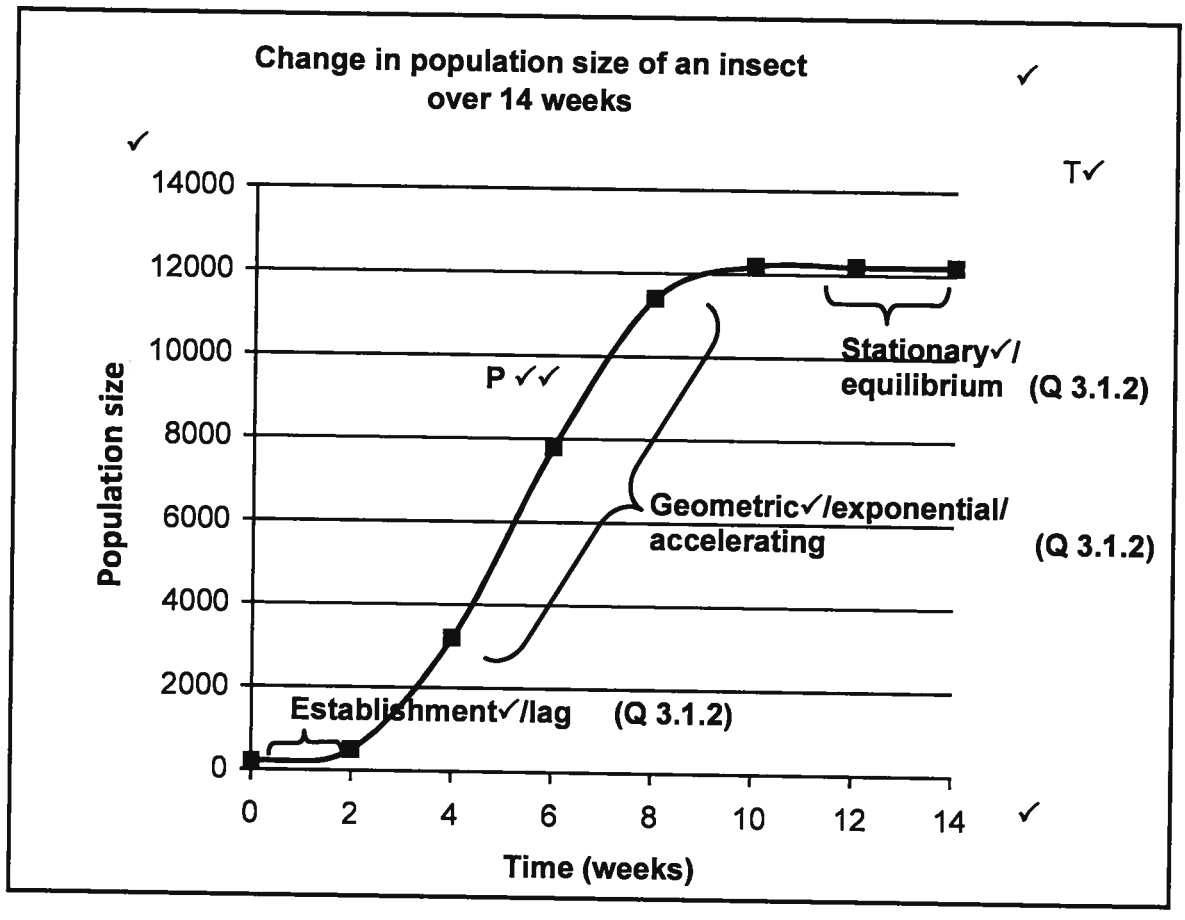
2.3.3 Number 3✓ (1)

2.3.4 The relative clarity of the image is the best ✓/has greatest number of cones for colour vision. (1)

2.3.5 Blind spot ✓ (1)
(10)
[30]

QUESTION 3

3.1 3.1.1 and 3.1.2



Checklist for the mark allocation of the graph

Correct type of graph with points joined (T)	1
Title of graph	1
Correct label for X-axis and Y-axis	1
Appropriate scale for X-axis and Y-axis	1
Plotting of points (P)	1 – 1 to 7 points plotted correctly 2 – all 8 points plotted correctly

NOTE:

If the wrong type of graph is drawn:
- Marks will be lost for 'correct type of graph'

If axes are transposed:
- Marks will be lost for labelling of X-axis and Y-axis

(6)

	3.1.2	**SEE GRAPH FOR 3.1.2**		(3)
	3.1.3	There is a stationary phase✓ in the logistic growth form.		(1) **(10)**
3.2	3.2.1	Number of pods✓ Number of seeds per pod✓		(2)
	3.2.2	Number of pods✓ per plant		(1)
	3.2.3	The average number of pods per plant decreased✓		(1)
	3.2.4	Light✓, water✓, space✓, nutrients✓ **(Mark first TWO only)**	Any	(2)
	3.2.5	6,0 x 8,3 x 20✓ = 996✓ seeds		(2)
	3.2.6	Group 1✓		(1)
	3.2.7	In group 1, 49✓/50 seeds are produced per plant, whereas in Group 5, 12✓/13 seeds are produced per plant.		(2)
	3.2.8	Plant of the same species✓ Plants of the same age✓ Plants of the same size✓ **(Mark first TWO only)**	Any	(2) **(13)**
3.3	3.3.1	The number of schools required✓ can be predicted by looking at the number of children that will be of school going age✓		(2)
	3.3.2	Loss of biodiversity✓ Increase in pollution✓ Desertification✓ Depletion of natural resources✓ **(Mark first TWO only)**	Any	(2)
	3.3.3	A✓		(1)
	3.3.4	Birth rate is higher✓ Life expectancy is lower✓ **(Mark first TWO only)**		(2) **(7)** **[30]**
			TOTAL SECTION B:	**60**

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SECTION C

QUESTION 4

4.1 4.1.1 Census✓ (1)

4.1.2 - All people to have sufficient food✓
- All people to have a reasonably good quality of life✓
(Mark first TWO only) Any order (2)

4.1.3 The population size would decrease✓ as one child will be replacing two adults✓ (2)

4.1.4 It could result in a greater proportion of males to females✓ as many abortions may take place when couples know that a girl baby is being expected✓/ girl children may be abandoned✓ (2)
(7)

4.2 4.2.1 To act as a control✓ allowing us to reason that any difference in starch content✓ was due to the action of the hormones ✓ Any (2)

4.2.2 (a) Stimulates✓ the accumulation of starch in cells✓ (2)
(b) Does not promote✓ the accumulation of starch in cells✓ (2)
(6)

4.3 4.3.1

$$P = \frac{M \times C}{R}$$

$$= \frac{(500 \times 450)}{5}\checkmark\checkmark$$

$$= 45\,000\checkmark \text{ beetles}$$

(3)

4.3.2 (a) Overestimated✓✓ (2)
(b) Underestimated✓ ✓ (2)
(7)
(20)

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4.4 **Hormones secreted by the pituitary gland**

Growth Hormone✓/(GH)
- Stimulates the growth of the long bones✓/skeletal muscles.

Follicle Stimulating Hormone✓/FSH
- Stimulates follicle development ✓in the ovaries of females.

Luteinising Hormone✓(LH)
- Stimulates ovulation✓/formation of the corpus luteum in the ovaries

Thyroid Stimulating Hormone✓/TSH
- Regulates the growth of the thyroid gland✓/secretion of thyroxin

Prolactin✓
- Stimulates the production of milk✓ by the mammary glands

ADH✓
- Regulates the water content✓ in the blood Any 4x2 (8)

Pituitary Control of Thyroid Function
- The pituitary is sensitive to the concentration of the hormone thyroxin✓ in the blood
- When the thyroxin concentration in the blood decreases✓ below a certain level
- the pituitary gland is stimulated to secrete more TSH✓
- TSH stimulates the thyroid gland✓
- to secrete more thyroxin✓
- thus increasing the level of thyroxin in the blood✓
- back to the normal level✓
- When the thyroxin concentration in the blood increases✓ above a certain level
- the pituitary gland secretes less TSH✓
- The lower TSH level means that the thyroid gland secrete less thyroxin✓
- This decreases the level of thyroxin in the blood✓
- back to the normal level✓

Max (9)

Content (17)
Synthesis (3)
(20)

ASSESSING THE PRESENTATION OF THE ESSAY

Description	Marks
All information given is relevant to the hormones of the pituitary gland and negative feedback involving the thyroid gland	1
The different events in negative feedback are presented in the correct sequence	1
Provided sufficient information on the hormones and negative feedback	1

TOTAL SECTION C: 40
GRAND TOTAL: 150

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