basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS

LIFE SCIENCES P1

2017

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 10 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	C✓✓		
	1.1.2	D✓✓		
	1.1.3	B✓✓		
	1.1.4	D✓✓		
	1.1.5	C✓✓		
	1.1.6	B✓✓		
	1.1.7	A✓✓		
	1.1.8	B✓✓		
	1.1.9	B✓✓		
	1.1.10	D✓✓	(10 x 2)	**(20)**
1.2	1.2.1	Biodiversity✓		
	1.2.2	Carbon footprint✓		
	1.2.3	Thermal✓pollution		
	1.2.4	Eutrophication✓		
	1.2.5	Testosterone✓		
	1.2.6	Vas deferens✓/sperm duct		
	1.2.7	Aldosterone✓		
	1.2.8	Prolactin✓		
	1.2.9	Cytokinesis✓	(9 x 1)	**(9)**
1.3	1.3.1	A only✓✓		(2)
	1.3.2	B only✓✓		(2)
	1.3.3	Both A and B✓✓		(2)
			(3 x 2)	**(6)**
1.4	1.4.1	(a) D✓ Synapse✓		(2)
		(b) C✓ Interneuron✓/Connector neuron		(2)
		(c) A✓ Dendrite✓		(2)
	1.4.2	(a) E✓		(1)
		(b) F✓		(1)
				(8)
1.5	1.5.1	(a) Zygote✓		(1)
		(b) Morula✓		(1)
		(c) Placenta✓		(1)
	1.5.2	(a) Fertilisation✓		(1)
		(b) Implantation✓		(1)
	1.5.3	(a) 46✓/23 pairs		(1)
		(b) 23✓		(1)
				(7)
			TOTAL SECTION A:	**50**

SECTION B

QUESTION 2

2.1 2.1.1
- The hatchling's eyes are closed✓
- The hatchling can't move✓
- The hatchling can't feed on its own✓
- The hatchling has no feathers✓/wings are not developed

(Any 2) (2)

(MARK FIRST TWO ONLY)

2.1.2
- Foetus develops inside the uterus✓ for greater protection✓
- Food is supplied by the mother✓ and is therefore supplied for a longer period✓ (Any 1 x 2) (2)

(MARK FIRST ONE ONLY)

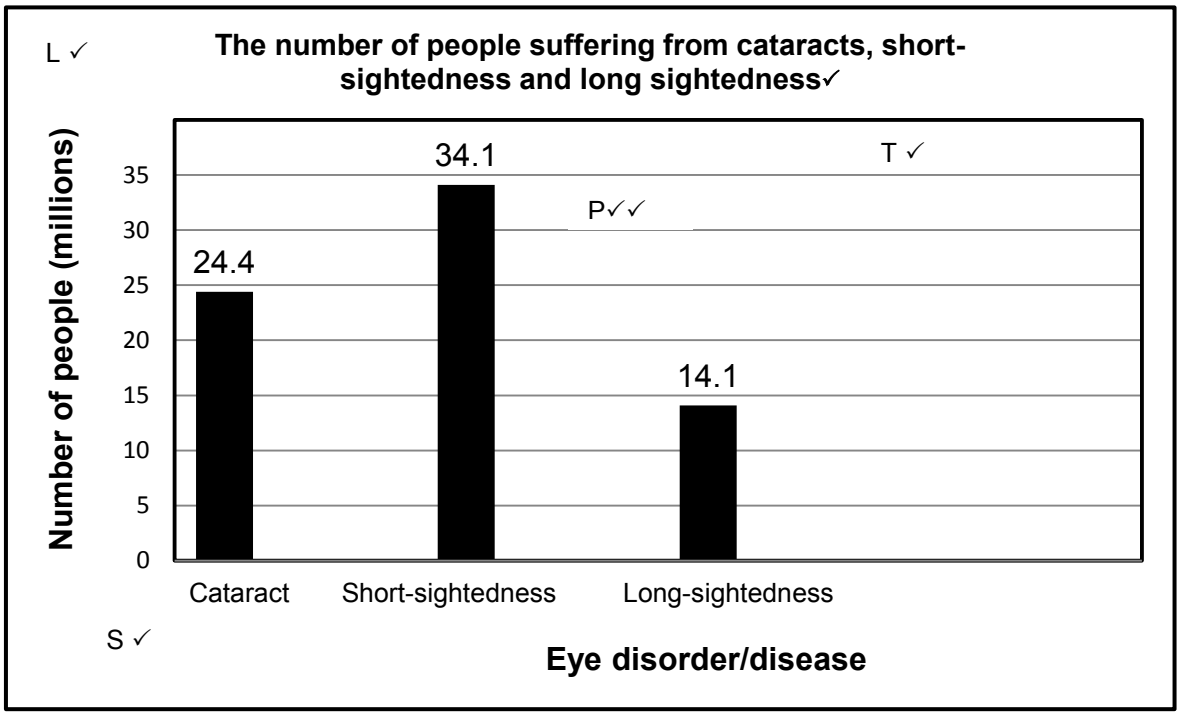
2.1.3
- More yolk allows for greater development✓ of the chick
- so that it can be more independent✓ after hatching (2)

(6)

2.2 2.2.1 Macular degeneration✓/Retina cells die (1)

2.2.2 14.1/142 ✓x 100✓ = 9.93✓%
(Accept 9.9 and 10%) (3)

2.2.3



Mark allocation of the graph

Criteria	Mark allocation
Bar graph drawn for 3 relevant diseases (T)	1
Title of graph	1
Correct scale for X-axis (equal width and spacing of the bars) and Y-axis (S)	1
Correct label and unit for X-axis and Y-axis (L)	1
Plotting of the bars (P)	0: No bars plotted correctly 1: 1 to 2 bars plotted correctly 2: All 3 bars plotted correctly

NOTE:
If a line graph is drawn – marks will be lost for the 'type and scale'
If a histogram is drawn – marks will be lost for the 'type of graph and correct scale'

(6)

2.2.4 (a) Cataract✓ (1)

(b) Short-sightedness✓ (1)
(12)

2.3 2.3.1 (a) Crop yields are dropping✓ (1)

(b) Water supplies are decreasing✓ (1)

2.3.2 395✓ parts per million✓/ppm (Accept 394 – 396 ppm) (2)

2.3.3
- Decreased photosynthesis✓
- Less CO_2 ✓used from the atmosphere
- therefore more carbon dioxide accumulates in the atmosphere✓
- This leads to the enhanced greenhouse effect✓ causing more global warming (Any 3)

OR

- Burning of forests✓
- releasing CO_2✓
- leading to the enhanced greenhouse effect✓ causing more global warming (3)

(7)

2.4
- An excessive growth of water hyacinths on the surface of the water will block out the light✓/deprive submerged plants of sunlight
- this limits photosynthesis✓/disrupts food chains/food webs

- Alien plants outcompete the indigenous species✓/Alien plants have no natural enemies
- this may lead to some of the indigenous species becoming eliminated✓/ disruption of the food chain/web

- The great demand of alien plants on natural resources,✓
- results in less resources being available for the indigenous species✓

(3 x 2) **(6)**

(MARK FIRST THREE ONLY)

2.5	2.5.1	Centriole✓	(1)
	2.5.2	Metaphase II✓	(1)
	2.5.3	- Single chromosomes✓ - arranged at the equator✓ of the cell	(2)
	2.5.4	- There is a random arrangement of chromosomes at the equator✓/the chromosomes flip over - Causing the chromosomes in the gametes to be different✓/Chromatids move in different combinations into each gamete	(2)
	2.5.5	(a) 6✓	(1)
		(b) 3✓	(1)
	2.5.6	Crossing over✓	(1) **(9)** **[40]**

QUESTION 3

3.1 3.1.1 Does drinking coffee containing caffeine increase stamina? ✓✓ (2)

3.1.2 (a) Amount of caffeine✓/Presence or absence of caffeine (1)

(b) - Stamina✓
- By measuring the average duration of cycling✓ (2)

3.1.3 The average cycling time of the cyclists/stamina increased with the use of caffeine✓✓ (2)

3.1.4
- Decaffeinated coffee serves as a control✓
- to eliminate any other factor✓ that may cause an increase in stamina/to confirm that caffeine causes the change (2)

3.1.5
- Knowing✓ whether caffeine is taken or not
- may subconsciously influence the performance✓ of the participants.

OR

- The participants may think they have more stamina✓ if they know that they are taking caffeine and
- this may influence their performance✓ (2)

3.1.6
- If too little time passes between the exercise tests, the participants may be tired✓
- which will influence their stamina for the second cycle test and therefore the validity✓ of the investigation

OR

- The participants must be equally rested✓ for both tests
- to ensure the validity✓ of the investigation

OR

- The cyclist may perform better in the second test because they are better warmed up✓ if the time between the tests is too short.
- This may influence the validity of the investigation✓ (Any 1 x 2) (2)

(13)

3.2 3.2.1 (a) Oestrogen✓ (1)

(b) Progesterone✓ (1)

3.2.2
- It increases✓
- the thickness✓ of the endometrium/the blood vessels in the endometrium/the amount of glandular tissue in the endometrium (2)

3.2.3 (a) Release of an ovum✓ from the ovary✓/Graafian follicle (2)

(b) Day 14✓ (1)

(c) LH✓/Luteinizing hormone (1)

3.2.4
- High levels of hormone B/progesterone will inhibit✓
- the secretion of FSH✓

OR

- No new ova/mature follicles✓
- are required during pregnancy✓ (2)

3.2.5
- The progesterone✓
- levels decreased✓
- because the corpus luteum degenerated✓ (3)

(13)

3.3 3.3.1 Geotropism✓/gravitropism (1)

3.3.2
- Auxins✓
- accumulate at the lower✓ part of the stem
- because of gravity✓
- The higher concentration of auxins at the lower part of the stem stimulates cell elongation✓/growth on the lower side of the stem
- The lower concentration of auxins at the upper part of the stem inhibits cell elongation✓/growth on the upper side of the stem

(Any 4) (4)

3.3.3
- The leaves and stem will be carried in such a way that they receive maximum sunlight✓
- for photosynthesis✓

OR

- Exposes the flowers more favourably✓
- for pollination✓/seed dispersal (2)

3.3.4 The roots will grow downwards✓/towards gravity (1)

(8)

3.4 3.4.1 Hypothalamus✓ (1)

3.4.2
- As the level of ADH in the blood increases the tubular reabsorption of water increases✓✓

OR

- As the level of ADH in the blood decreases the tubular reabsorption of water decreases✓✓ (2)

3.4.3
- On a cold day the body loses less water through sweating✓/ the blood has more water than normal
- The hypothalamus✓ sends impulses to the
- pituitary gland✓
- to secrete less ADH✓ (Any 3) (3)

(6)

[40]

TOTAL SECTION B: 80

SECTION C

QUESTION 4

Thermoregulation✓
- Receptors✓ in the skin detect the stimulus
- Send the impulses to the hypothalamus✓ of the brain
- The hypothalamus sends impulses to the blood vessels✓ of the skin
- Blood vessels constrict✓ (become narrow)/vasoconstriction occurs
- Less blood flows to the skin✓
- Less heat is lost✓ from the skin
- Less blood is sent to the sweat glands✓
- Sweat glands become less active✓/Less sweat is released
- There is less evaporation of sweat✓
- and less cooling of the skin✓ Max (8)

Hearing
- The pinna traps the sound waves✓
- and directs them into the auditory canal✓/meatus
- This causes the tympanic membrane to vibrate✓
- The vibration is transmitted to the auditory ossicles✓/(malleus, incus, stapes)
- The ossicles amplify the vibration✓
- and transmit it to the oval window✓
- The oval window vibrates✓
- creating pressure waves✓
- in the endolymph✓
- which stimulates the Organ of Corti✓
- The stimulus is converted to an impulse✓
- The impulse is transmitted via the auditory nerve✓
- to the cerebrum✓
- where sound is interpreted✓ Max (9)

Content: (17)
Synthesis: (3)
(20)

ASSESSING THE PRESENTATION OF THE ESSAY

Relevance	Logical sequence	Comprehensive
All information provided is relevant to the question	Ideas arranged in a logical/ cause-effect sequence	Answered all aspects required by the essay in sufficient detail
Only information regarding: - Thermoregulation in cold conditions and - Hearing is described No irrelevant information.	The sequence of events in thermoregulation and hearing is in the correct order.	At least the following points should be included: - Thermoregulation in cold conditions **(5/8)** - Hearing **(6/9)**
1 mark	1 mark	1 mark

TOTAL SECTION C: 20
GRAND TOTAL: 150