basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES P1

NOVEMBER 2019

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 11 pages +
the master for the transparency to mark Question 2.3.5

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	B✓✓		
	1.1.2	C✓✓		
	1.1.3	C✓✓		
	1.1.4	A✓✓		
	1.1.5	B✓✓		
	1.1.6	C✓✓		
	1.1.7	A✓✓		
	1.1.8	B✓✓		
	1.1.9	A✓✓		
	1.1.10	D✓✓	(10 x 2)	**(20)**
1.2	1.2.1	Chorionic villi✓		
	1.2.2	Cytokinesis✓		
	1.2.3	Invasive alien✓/Invasive exotic		
	1.2.4	Vagina✓		
	1.2.5	Deforestation✓		
	1.2.6	Prolactin✓		
	1.2.7	Gestation✓		
	1.2.8	Fallopian tubes✓/Oviducts		
	1.2.9	Puberty✓		**(9)**
1.3	1.3.1	A only✓✓		
	1.3.2	A only✓✓		
	1.3.3	B only✓✓	(3 x 2)	**(6)**
1.4	1.4.1	(a) Jelly layer✓/Zona pellucida		(1)
		(b) Cytoplasm✓/cytosol		(1)
		(c) Acrosome✓		(1)
	1.4.2	Oogenesis✓		(1)
	1.4.3	D✓		(1)
	1.4.4	E✓		
		F✓		(2)
		(Mark first TWO only)		**(7)**
1.5	1.5.1	(a) Spinal cord✓		(1)
		(b) Corpus callosum✓		(1)
	1.5.2	(a) D✓ Cerebrum✓		(2)
		(b) B✓ Medulla oblongata✓		(2)
		(c) E✓ Cerebellum✓		(2)
				(8)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 (a) Centromere✓ (1)

(b) Homologous chromosomes✓ (1)

(c) Spindle fibre✓/spindle threads (1)

2.1.2 Anaphase II✓ (1)

2.1.3 2, 1, 3✓✓ (2)

2.1.4 In metaphase I, the chromosomes arrange at the equator in homologous pairs✓ whereas
in metaphase II, the chromosomes arrange at the equator singly✓ (2)
(Mark first ONE only) **(8)**

2.2 2.2.1 Eggs are retained/hatch in the female body and the young are born live✓✓ (2)

2.2.2 2✓ (1)
(Mark first ONE only)

2.2.3 - The egg has the highest yolk✓/energy content
- that will allow maximum development before hatching✓ (2)

2.2.4 1✓ (1)
(Mark first ONE only) **(6)**

2.3 2.3.1 Long-sightedness✓ (1)

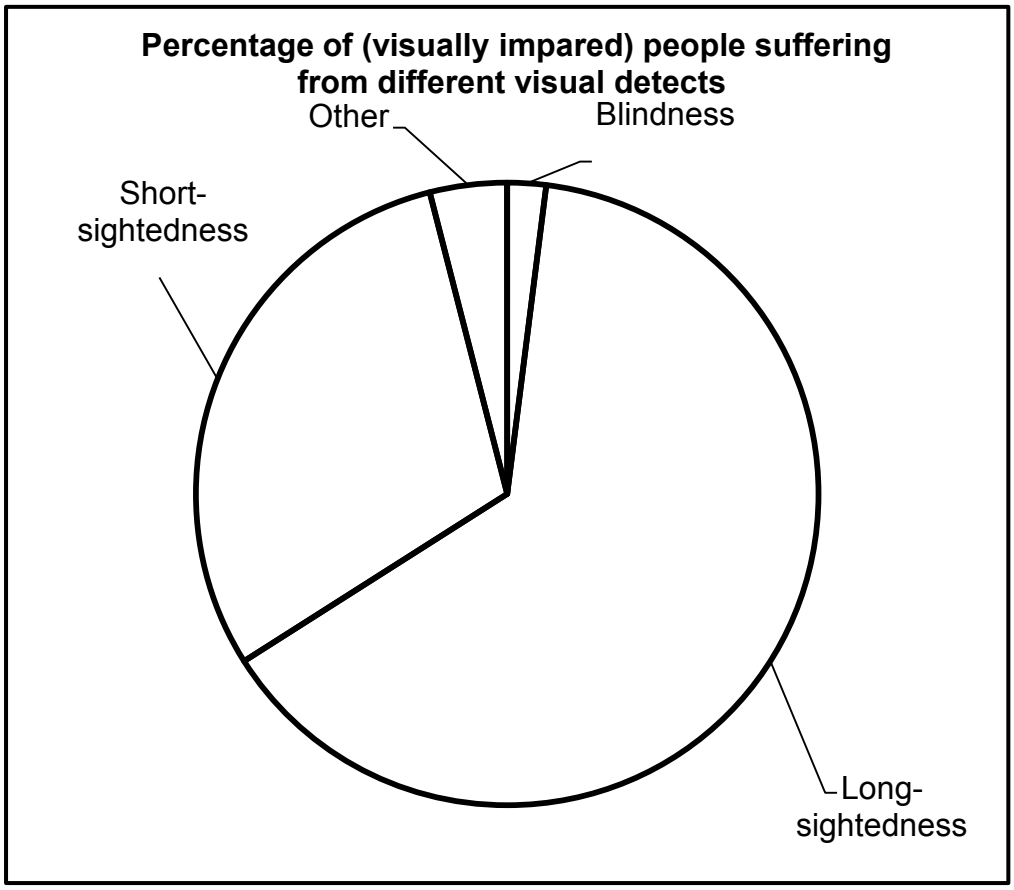
2.3.2 (a) - The lens becomes opaque✓/milky/cloudy
- and therefore does not allow the light to pass through✓ (2)

(b) Surgery✓ (1)
(Mark first ONE only)

2.3.3 - The lens is less convex✓/the eye ball is too short/cornea is flat
- This causes the light rays to fall behind the retina✓
- A biconvex lens increases the refractive power✓
- Therefore light rays are focussed on the retina✓ to form a clear image (4)

2.3.4 Astigmatism✓ (1)

2.3.5



Calculations:

Blindness: 2/100 x 360° = 7,2°
Short-sightedness: 30/100 x 360° = 108°
Long-sightedness: 64/100 x 360° = 230,4°
Other: 4/100 x 360° = 14,4°

Criteria for assessing the graph:

Pie chart drawn (**T**)	1
Title of the graph shows the relationship between the two variables (**H**)	1
Correct calculations to determine the proportions (**C**)	2: All 4 correct 1: 1-3 correct
Correct proportions for the labelled sectors (**P**) (To be checked using prepared transparency – see *Annexure A – Page 12*)	2: All 4 sectors correct 1: 1-2 sectors correct

(6)
(15)

2.4 2.4.1
- The high levels of progesterone✓in the pills
- will inhibit the secretion of FSH✓from the pituitary gland
- No follicle will develop✓
- and hence no oestrogen will be secreted✓ (4)

2.4.2
- The increase in the progesterone level✓
- indicates that corpus luteum has been formed✓ (2)

2.4.3
- Women will stay in the habit of taking a pill every day✓/will not forget to take the progesterone containing pills

- To allow menstruation to occur✓ Any (1)

(Mark first ONE only) **(7)**

2.5
- Zygote divides by mitosis✓
- to form a ball of cells✓
- called the morula✓
- which further divides to form a hollow ball of cells✓
- called the blastula✓/blastocyst Any **(4)**

[40]

QUESTION 3

3.1 3.1.1 (a) ADH✓/antidiuretic hormone/vasopressin (1)

(b) Aldosterone✓ (1)

3.1.2 Adrenal✓gland (1)

3.1.3 3✓ (1)

3.1.4
- The blood will have a high salt content✓
- and therefore less/no aldosterone will be secreted✓
- resulting in less salt reabsorbed into the blood✓/more salt excreted in the urine
- The blood will have less water than normal✓
- and therefore more ADH will be secreted✓
- making the kidney tubules more permeable✓
- resulting in more water reabsorbed into the blood✓/less water will leave the body with the urine

Any (5)
(9)

3.2 3.2.1 Islets of Langerhans✓/pancreas (1)

3.2.2 Adrenalin✓ (1)

3.2.3 Same:
- Type of food given✓
- Concentration of adrenalin✓
- Amount of adrenalin✓
- Measuring tools used✓
- Person measuring the glucose concentrations✓
- Levels of activity✓
- Age of patients✓
- Body mass of patients✓
- Health condition of patients✓

(Mark first THREE only) Any (3)

3.2.4
- Provides a baseline✓/starting level/point of reference/control
- to compare with the effect of injecting adrenalin✓ (2)

3.2.5
- Hormones are proteins✓
- and will therefore be digested✓/denatured making it ineffective

OR

- Since it enters the blood directly✓
- it will reach the target organs faster✓ (2)

3.2.6
- The blood glucose levels will increase✓
- because an increase in adrenalin stimulates the conversion of glycogen to glucose✓ (2)

3.2.7 Increases reliability✓ of the results (1)
(12)

3.3 3.3.1
- Biodiversity will decrease✓*
- The flow of the river decreases✓/size of habitat decreases
- This may affect migration patterns✓/spawning of fish
- Opening of floodgates increases pressure of water flow✓

1 compulsory* + any 1 other (2)

3.3.2
- The water quality will decrease✓*
- as the fertilisers increase the amount of nutrients✓/cause eutrophication
- which will result in algal bloom✓
- This will block-out the sunlight✓
- The under-water plants cannot photosynthesise✓/die
- Animals that feed on plants also die✓
- This leads to an increase in decomposers✓ feeding off the dead organisms
- The decomposers deplete the oxygen in the water✓

1 compulsory* + any 4 others (5)

3.3.3
- Constant availability of water✓
  to increase crop yield✓
- More food will be available✓
  and hence less money spent on buying agricultural products✓
- More people are employed in the management of agriculture✓/dam/tourism
  therefore more income stability for the people in the community✓

(Mark first ONE only) Any 1 x 2 (2)
(9)

3.4 3.4.1 8,7 – 3,8✓ **OR** 8,7 - (2,5 + 0,5 + 0,8)

= 4,9 ✓ billion tons (2)

3.4.2
- There would be an increase in global warming✓*
- The burning of plastic releases carbon dioxide✓into the atmosphere
- leading to the enhanced greenhouse effect✓
- increasing the amount of heat trapped in the atmosphere✓
- causing an increase in temperature✓

1 compulsory* + any 3 others (4)

3.4.3
- Supply special bins✓/garbage bags to encourage the collection of plastic✓
- Bring recycling stations close to communities✓to increase access✓
- Increase campaigns✓/ awareness/ education on the benefits of recycling✓
- Giving incentives✓ for collecting more plastics✓

(Mark first TWO only) Any (2 x 2) (4)
(10)
[40]

SECTION C

QUESTION 4

Plant's response to gravity (P)

When a plant is placed horizontally:
- auxins✓
- are attracted by gravity✓

Root
- There is a high concentration of auxins on the lower side of the root✓
- which inhibits growth/cell elongation/cell division on the lower side✓
- There is a low concentration of auxins on the upper side of the root✓
- which stimulates growth/cell elongation/cell division on the upper side✓
- The upper side of the root grows faster✓/Uneven growth occurs
- causing the root to grow/bend downwards✓
- The root grows towards gravity✓/The root is positively geotropic

Stem
- There is a high concentration of auxins on the lower side of the stem✓
- which stimulates growth/cell elongation/cell division on the lower side✓
- There is a low concentration of auxins on the upper side of the stem✓
- which inhibits growth/cell elongation/cell division on the upper side✓
- The lower side of the stem grows faster✓/Uneven growth occurs
- causing the stem to grow/bend upwards✓
- The stem grows away from gravity✓/The stem is negatively geotropic (11)

Maintaining balance (B)

When the position of the head changes, the maculae:
- are stimulated✓
- The stimulus is converted to an impulse✓
- which is transmitted by the auditory nerve✓
- to the cerebellum✓
- where the impulse is interpreted✓
- The cerebellum sends impulses to the muscles✓
- and balance is restored✓ Any (6)

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
All information is relevant to the: - Plant response to gravity - Maintenance of balance There is no irrelevant information	The sequence of events in the: - Plant response to gravity - Maintenance of balance are in a logical sequence	The following must be included: - Plant response to gravity **(P)** (7/11) - Maintaining balance **(B)** (4/6)
1 mark	1 mark	1 mark

TOTAL SECTION C: 20
GRAND TOTAL: 150

Annexure A – Master for transparency to mark Question 2.3.5