



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

LIFE SCIENCES P1

NOVEMBER 2017

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist 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	B✓✓		
	1.1.3	D✓✓		
	1.1.4	A✓✓		
	1.1.5	C✓✓		
	1.1.6	C✓✓		
	1.1.7	D✓✓		
	1.1.8	B✓✓		
	1.1.9	B✓✓		
	1.1.10	D✓✓	(10 x 2)	(20)
1.2	1.2.1	External✓ fertilisation		
	1.2.2	Chiasma✓		
	1.2.3	Aldosterone✓		
	1.2.4	Homeostasis✓		
	1.2.5	Amniotic✓ egg		
	1.2.6	Luteinising hormone✓/LH		
	1.2.7	Astigmatism✓		
	1.2.8	Corpus callosum✓		
	1.2.9	Optic✓ nerve		
	1.2.10	Meninges✓		(10)
1.3	1.3.1	None✓✓		(2)
	1.3.2	B only✓✓		(2)
	1.3.3	A only✓✓		(2)
			(3 x 2)	(6)
1.4	1.4.1	Motor✓ neuron		(1)
	1.4.2	(a) Nucleus✓/nuclear membrane		(1)
		(b) Cytoplasm✓		(1)
		(c) Dendrite✓		(1)
	1.4.3	(a) C✓ - Axon✓		(2)
		(b) D✓ - Myelin sheath✓		(2)
	1.4.4	Multiple sclerosis✓		(1)
				(9)
1.5	1.5.1	Pancreas✓		(1)
	1.5.2	Insulin✓		(1)
	1.5.3	Glucagon✓		(1)
	1.5.4	Diabetes✓mellitus		(1)
	1.5.5	Negative feedback✓		(1)
				(5)
			TOTAL SECTION A:	50

SECTION B**QUESTION 2**

- 2.1 2.1.1 Northern Cape✓ (1)
- 2.1.2 Eastern Cape✓ (1)
- 2.1.3 74,72 OR 74,7 OR 75✓✓✓% (3)
- OR (if candidate does not have above answer)
- $$\frac{33,4/(78,1-44,7)✓}{44,7} \times 100✓ \quad \text{Max (2)}$$
- 2.1.4 - Western Cape✓ and
- Kwazulu-Natal✓ (2)
(MARK FIRST TWO ONLY)
- 2.1.5 - Research alternative methods✓/e.g.desalinate seawater/cloud seeding to supplement the normal water supplies✓
- Fix/maintain all waterworks✓/pipe systems to prevent water loss by leaking✓
- Locate aquifers✓/boreholes/underground water to provide additional water sources✓
- Penalise people who are using too much water✓ to prevent them from wasting water✓
- Remove alien plants✓in the catchment area of the dam to ensure that more water reaches the dams✓
- Increase awareness✓ to encourage wise water use✓
- Offer water tanks at a reduced price✓ to create additional source of water✓
- Recycle grey water✓ to provide additional water sources✓
- Build dams✓ to store water✓ (Any 2 x 2) (4)
(MARK FIRST TWO ONLY)

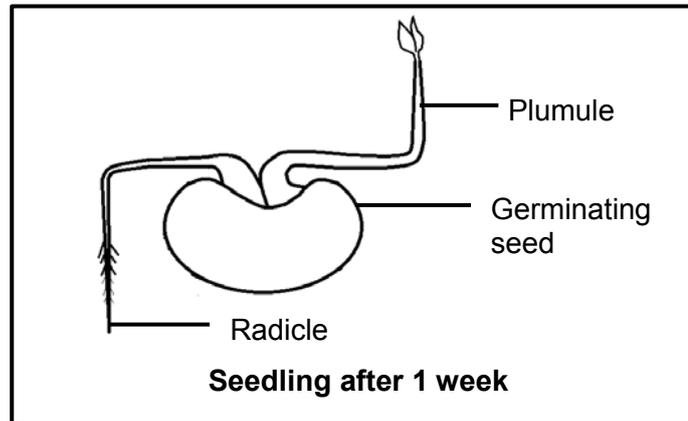
- 2.1.6
- Habitats are destroyed✓
which will lead to a loss in biodiversity✓
 - When flood gates are opened flooding may occur in the areas downstream from the dam✓
resulting in erosion✓/loss of top soil/loss of lives/loss of biodiversity
 - The river downstream from the dam will receive less water✓
which may have a negative impact on aquatic ecosystems✓/lead to biodiversity loss
 - Wall blocks fish migration✓
decreasing spawning✓/reproduction/survival
 - Dam wall restricts movement of organisms✓
affecting food chains/webs✓
- (Any 2 x 2) (4)
(15)
- 2.2
- 2.2.1
- Food security refers to the access by all people✓
 - at all times✓
 - to adequate✓/safe/nutritious food
- (Any 2) (2)
- 2.2.2
- 'endemic to North and South America'✓
 - 'the armyworm reached Africa'✓
 - 'Invasion of *Spodoptera*'✓
- (Any 1) (1)
(1)
- 2.2.3
- Maize imports✓
 - High altitude wind streams✓
- OR**
- Eggs✓
 - Moths✓
- (MARK FIRST TWO ONLY)** (2)
- 2.2.4
- Chemical✓control (1)
- 2.2.5
- The armyworm may lead to crop failure✓/food shortages that will mean financial/job losses✓for farmers
 - Food shortages✓/maize will have to be imported that will cause increase in food prices✓
 - Using pesticides could adversely influence other crops✓ that will cause increase in food prices✓
 - Using pesticides is expensive✓and will lead to increased food prices✓
- (Any 1 x 2) (2)
(8)

2.3	2.3.1	Telophase II✓		(1)
	2.3.2	- There are 4 cells✓ - Each cell contains only a single set of un-replicated✓/single stranded chromosomes		(2)
		(MARK FIRST TWO ONLY)		
	2.3.3	(a) Two/2✓		(1)
		(b) Four✓/4/2 pairs		(1)
	2.3.4	(a) - Crossing over✓ - Random arrangement✓ of chromosomes on the equator		(2)
		(MARK FIRST TWO ONLY)		
		(b) - The gametes that form will be genetically different✓ - leading to variation in the offspring✓/increasing the gene pool - This increases a species chances of survival✓		(3)
				(10)
2.4	2.4.1	(a) Chorion✓/Amnion		(1)
		(b) Umbilical cord✓		(1)
	2.4.2	- Protects the foetus from shock✓/Acts as a shock absorber - Protects the foetus from drying out✓ - Protects the foetus from temperature changes✓ - Allows free movement of the foetus✓	(Any 2)	(2)
		(MARK FIRST TWO ONLY)		
	2.4.3	- Gaseous exchange system✓ - Excretory system✓ - Digestive system✓	(Any 1)	(1)
		(MARK FIRST ONE ONLY)		
	2.4.4	- The foetus will receive less nutrients✓ and therefore have a lower birth mass✓/physical under-development/mental under-development		
		- The foetus will receive less oxygen✓ and therefore have a lower birth mass✓/physical under-development/mental under-development		
		- Waste will accumulate✓ and it will affect the functioning of the foetus✓	(A)	(2)
		(MARK FIRST ONE ONLY)		(7)
				[40]

QUESTION 3

- 3.1 3.1.1 - The growth of a plant✓/part of a plant
- in response to a stimulus✓ (2)

3.1.2



Checklist for marking the diagram:

Caption	(1)
Correct drawing:	
Radicle growing downwards	(1)
Plumule growing upwards	(1)
ONE correct label: Plumule/radicle/germinating seed	(1)
Total	(4)

- (4)
(6)
- 3.2 3.2.1 Tip of the stem✓/tip of root/apical meristem/terminal bud/apical bud (1)
- 3.2.2 - The stem grows✓✓/bends
- towards the light✓✓ (4)
(5)
- 3.3 3.3.1 - Group A✓
- Group C✓ (2)
- 3.3.2 (a) Amount of Thyroxin✓ (1)
- (b) Metabolic rate✓
By measuring the **change in mass✓/consumption of oxygen** (2)
- 3.3.3 Z, X, Y ✓✓ (2)

- 3.3.4 Group B✓ (1)
- 3.3.5 - The mass of the rats decreased✓/changed from 320 g to 309 g
 - since body fat is used✓/ less fat is stored
 - The oxygen consumption was the highest✓/(10ml/kg/min)
 - indicating an increased rate of metabolism✓/respiration
 - which is caused by the higher thyroxin concentration✓
 - Diet Y is the only diet that contained thyroxin✓/ group B receives thyroxin through diet Y (Any 5) (5)
- 3.3.6 - The age of the rats must be the same✓
 - All the rats must receive the same amount of food✓
 - Food must be given at the same time✓
 - The rats must be of the same species✓/genetically similar
 - Use the same instrument to measure mass✓
 - The same person must take the measurements✓
 - Use identical cages✓ (Any 3) (3)
- (MARK FIRST THREE ONLY) (16)**
- 3.4 3.4.1 (a) Auditory nerve✓ (1)
- (b) Round window✓/Fenestra rotunda (1)
- 3.4.2 Cerebrum✓ (1)
- 3.4.3 - The cristae✓in the semi-circular canals
 - are stimulated by changes in speed and direction✓
 - when the endolymph moves✓
 - The cristae convert the stimuli to nerve impulses✓
 - The nerve impulses are transported along the auditory nerve✓
 - to the cerebellum✓to be interpreted
 - Impulses sent to muscles✓ to restore balance (Any 5) (5)
- 3.4.4 - The mucus will block the opening of the Eustachian tube✓
 - Air cannot enter or leave✓the middle ear
 - to equalise pressure✓/causing imbalance in pressure
- OR**
- Mucus may move through the Eustachian tube✓
 - causing pressure in the middle ear✓
 - pushing on the tympanic membrane✓/part E (3)
- 3.4.5 - The ossicles/structures at A will not be able to vibrate✓
 - and hence no vibrations will be passed to the inner ear✓/cochlea will not be stimulated/no amplification (2)
- (13)**
[40]

TOTAL SECTION B: 80

SECTION C**QUESTION 4****Spermatogenesis✓ (S)**

- Takes place under the influence of testosterone✓
- in the seminiferous tubules✓/testis
- Diploid cells✓/germinal epithelium
- undergo meiosis✓
- to form haploid sperm cells✓

(Any 4) (4)

Formation and transport of semen (T)

- Sperm mature✓/are temporarily stored
- in the epididymis✓
- During ejaculation✓
- sperm move into the vas deferens✓
- As it passes the seminal vesicles✓,
- prostate gland✓ and
- Cowper's glands✓
- fluids are added that provide nutrition,✓
- promote the movement✓ of the sperm
- and neutralise the acids ✓ produced in the vagina
- The semen passes through the urethra✓
- of the penis✓
- into the vagina✓
- during copulation✓
- and swims up the Fallopian tube✓ where it meets the ovum

(Any 7) (7)

Structural suitability of the sperm cell for fertilisation (A)

- The acrosome✓
 - contains enzymes to dissolve a path into the ovum✓

 - Nucleus of the sperm✓
 - carries genetic material of the male✓/haploid number of chromosomes

 - Many mitochondria✓ in the middle piece
 - release energy✓ so that sperms could swim

 - The presence of a tail✓
 - enables sperm cells to swim✓ towards the ovum

 - The contents of the sperm cell such as the cytoplasm is reduced✓/condensed
 - making the sperm light for efficient movement✓

 - Sperm is streamlined✓
 - to allow for easier movement✓
- (MARK FIRST THREE ONLY)**

(Any 3 x 2) (6)

Content (17)
Synthesis (3)
(20)

ASSESSING THE PRESENTATION OF THE ESSAY

Relevance (R)	Logical sequence (L)	Comprehensive (C)
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 relevant to - Spermatogenesis - Formation and transport of semen - Structural suitability of sperm. There is no irrelevant information	The information on - Spermatogenesis - Formation and transport of semen and - Structural suitability of sperm is in a logical sequence	The following must be included: - Spermatogenesis (2/4) - Formation and transport semen (5/7) - Structural suitability of sperm (4/6)
1 mark	1 mark	1 mark

TOTAL SECTION C: 20
GRAND TOTAL: 150