



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

LIFE SCIENCES P1

2021

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 9 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	C✓✓		
	1.1.4	C✓✓		
	1.1.5	B✓✓		
	1.1.6	B✓✓		
	1.1.7	D✓✓		
	1.1.8	B✓✓		
	1.1.9	C✓✓		
	1.1.10	A✓✓	(10 x 2)	(20)
1.2	1.2.1	Monoculture✓		
	1.2.2	Deforestation✓		
	1.2.3	Penis✓		
	1.2.4	Peripheral✓		
	1.2.5	Binocular✓/stereoscopic vision		
	1.2.6	Corpus luteum✓		
	1.2.7	Synapse✓		
	1.2.8	Aquifer✓		
	1.2.9	Oestrogen✓	(9 x 1)	(9)
1.3	1.3.1	Both A and B✓✓		
	1.3.2	A only✓✓		
	1.3.3	Both A and B✓✓	(3 x 2)	(6)
1.4	1.4.1	(a) Semi-circular canals✓		(1)
		(b) Auditory nerve✓		(1)
	1.4.2	(a) E✓ Oval window✓		(2)
		(b) D✓ Round window✓		(2)
	1.4.3	(a) Cerebellum✓		(1)
		(b) Hair cells✓/Organ of Corti		(1)
				(8)
1.5	1.5.1	Reflex arc✓		(1)
	1.5.2	To minimise injury✓		(1)
	1.5.3	(a) Interneuron✓/connector		(1)
		(b) Ventral root✓		(1)
		(c) Effector✓/muscle		(1)
	1.5.4	A✓ Sensory✓neuron		(2)
				(7)

TOTAL SECTION A: 50

SECTION B**QUESTION 2**

	2.1.1	Centromere✓		(1)
	2.1.2	Metaphase I✓		(1)
	2.1.3	- A pair of chromosomes with the same structure✓/ location of centromere/ length and - the same sequence of genes✓ - One is of maternal origin and the other of paternal origin✓	Any	(2)
	2.1.4	- Some chromatids have a mixture of genetic material✓from its homologue - as crossing over✓ took place - during prophase I✓		(3)
	2.1.5	(Contracts) to pull the chromosome to the pole✓		(1)
	2.1.6	48✓✓ arbitrary units		(2)
				(10)
2.2	2.2.1	Sweat gland✓		(1)
	2.2.2	- Structure A will constrict✓/vasoconstriction occurs - Less blood flows towards the surface✓of the skin - Less heat is lost✓ through the surface of the skin - Temperature increases✓ / returns to normal	Any	(3)
	2.2.3	- Enzymes function optimally✓ at normal body temperature✓/37° C - Enzymes/proteins will denature✓ at high temperatures✓ - Enzymes will become inactive✓ at low temperatures✓	Any (1 x 2)	(2)
		(Mark first ONE only)		(6)
2.3	2.3.1	Pituitary gland✓/Hypophysis/Hypothalamus		(1)
	2.3.2	- Water levels are higher than normal in blood✓ - since less water is lost through sweating✓ - therefore less/no ADH will be secreted✓ - renal tubules become less permeable to water✓ - Therefore, less water is reabsorbed✓/ more urine is produced	Any	(3)
	2.3.3	- Water cannot be reabsorbed✓/the water is in the urine since renal tubules are resistant to the effects of ADH - Water levels are lower than normal in blood✓ - therefore, more ADH is secreted✓		(3)
				(7)

2.4	2.4.1	Internal✓ fertilisation		(1)
	2.4.2	- Sperm are deposited inside the female body✓ thereby increasing the chances of fertilisation✓ - Gametes/zygotes are inside the body✓ therefore protected from the predators✓/ environmental dangers	(2 x 2)	(4)
		(Mark first TWO only)		
	2.4.3	- The eggs hatch inside the female's body✓ - and the young are born live✓		(2) (7)
2.5	2.5.1	- Progesterone maintains/thickens the endometrium✓ - and therefore, maintains the pregnancy✓		(2)
	2.5.2	(a) Progesterone treatment✓		(1)
		(b) Development of gestational diabetes✓		(1)
	2.5.3	- Glucose levels were taken✓ daily - When the glucose level of a pregnant woman remains high continuously✓it indicates the development of gestational diabetes		(2)
	2.5.4	- (Same) dosage✓/250 mg of progesterone - (Same) period of time for injection✓/injections given between weeks 16 and 20 - (Same) frequency of injections✓/ weekly injections	Any	(2)
		(Mark first TWO only)		
	2.5.5	- Group B did not receive progesterone✓ - If gestational diabetes develops in group A it would be due to the progesterone treatment✓		(2) (10) [40]

QUESTION 3

- 3.1 3.1.1 Sclera✓ (1)
- 3.1.2 - Absorbs light rays✓/prevents internal reflection of light in the eye
- Blood vessels in part B supply the cells of the eye with oxygen✓/nutrients Any (1)
- (Mark first ONE only)**
- 3.1.3 - Part **D** contains photoreceptors✓/cones
- therefore the (clearest) image forms✓ if light falls on this part
- Part **E** has no photoreceptors✓/rods and cones
- therefore, no image✓ will form if light falls on this part (4)
- 3.1.4 (Bi)concave✓ lenses (1)
- 3.1.5 - Biconcave lenses will help to diverge the light✓ before they enter the eye
- to focus on the retina✓ (2)
- 3.1.6 - It is elastic✓
and can change its shape✓ to focus light rays on the retina
(Mark first ONE only) (1 x 2) (2)
- 3.1.7 - Radial✓/ dilator muscles
- Circular✓/sphincter muscles (2)
- (Mark first TWO only)**
- 3.1.8 - Astigmatism✓
- Light is refracted unevenly✓/distorted
- forming a blurred image✓ (3)
- (16)**
- 3.2 3.2.1 They stimulate cell elongation✓/cell division
(Mark first ONE only) (1)
- 3.2.2 - To prevent weeds from competing with crops✓
- for water✓/nutrients/space/sunlight (2)
- 3.2.3 - They may kill other organisms✓
- They may accumulate in ecosystems✓
- They may disrupt ecosystems✓ Any (1)
- (Mark first ONE only)**
- 3.2.4 - The application of auxin-based herbicides is less labour intensive✓✓/less time-consuming/less expensive than mechanical removal
- Auxin-based herbicides will kill the whole plant but with physical removal only part of the plant may be removed✓✓ Any (1 x 2) (2)
- (Mark first ONE only)**
- 3.2.5 - Auxin-based herbicides selectively kill broad leaved plants✓
- and the farmer will lose money✓/the bean crop will fail (2)
- (8)**

	3.3.1	Sheep and goats✓		(1)
	3.3.2	To trap heat energy/ keep Earth warm enough to sustain life✓ (Mark first ONE only)		(1)
	3.3.3	4 623 – 1 826✓(668+684+474) million tonnes = 2 797✓million tonnes / 2 797 000 000 (tonnes)		(2)
	3.3.4	- Landfills✓ - Rice paddies✓ - Waterlogged soil✓/wetlands - Mining of coal✓ - Fossil fuels✓ - Biofuels✓ - Fracking✓ - Sewage✓ - Decomposition✓ - Melting of ice in glaciers✓	Any	(1)
		(Mark first ONE only)		
	3.3.5	- More greenhouse gases✓/ carbon dioxide/ methane is released into the atmosphere - Therefore, more heat is trapped✓/causing an enhanced greenhouse effect - leading to an increase in (global) temperatures✓ hence global warming increases	Any	(3) (8)
3.4	3.4.1	Thermal pollution refers to the change from the normal temperature of an aquatic ecosystem✓		(1)
	3.4.2	- Thermal pollution lowers the oxygen content✓/causes algal bloom/increased number of bacteria in the water - which reduces✓ the quality of the water		(2)
	3.4.3	- The hot water can be stored until it is cooled down✓ before it is released into the river - After cooling down the hot water, it can be re-used to cool down the plant again✓ - Use fans/other technology for cooling down of machinery✓	Any	(1)
		(Mark first ONE only)		
	3.4.4	- The warm water may cause fish to die✓/move away - which will cause a loss of income✓ to the fishermen		(2)
	3.4.5	- The biodiversity increased✓ - since no thermal pollution occurred✓		(2) (8) [40]
		TOTAL SECTION B:		80

SECTION C**QUESTION 4****Development of zygote and the formation of placenta and umbilical cord**

- The zygote divides by mitosis✓
- to form a (solid) ball of cells✓
- called the morula✓
- which further divides to form a hollow ball of cells✓
- called the blastocyst✓/blastula
- The blastocyst/blastula enters the uterus✓
- It implants in the endometrium✓
- This is called implantation✓
- The outer layer of the embryo becomes a chorion✓ and
- inner layer becomes an amnion✓
- with the amniotic fluid inside✓
- After implantation the chorion develops many finger-like outgrowths✓
- called chorionic villi✓
- The endometrium together with the chorionic villi forms the placenta✓
- The placenta consists of blood rich embryonic and maternal tissues✓
- The umbilical cord develops between the foetus and the placenta✓
- It consists of a hollow tube✓
- that contains the umbilical artery✓
- and the umbilical vein✓
- Up to 8 -12 weeks of development it is called the embryo✓
- When differentiation of tissues into organs occurs✓
- and now is called a foetus✓

Any (17)
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 the information is relevant to: - Development from the zygote to the formation of the placenta and umbilical cord	The sequence of the events in the: - Development from the zygote to the formation of the placenta and umbilical cord	The following must be included: - Development from the zygote to the formation of the placenta and umbilical cord (11/17)
No irrelevant information	are in a logical sequence	
1 mark	1 mark	1 mark

TOTAL SECTION C: 20
GRAND TOTAL: 150