Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2018

LIFE SCIENCES P1 MARKING GUIDELINE

MARKS: **150**

This marking guideline consists of 9 pages.

SECTION A

QUESTION 1

1.1	1.1.1	C ✓✓		
	1.1.2	A ✓✓		
	1.1.3	D ✓✓		
	1.1.4	C ✓✓		
	1.1.5	B ✓✓		
	1.1.6	C ✓✓		
	1.1.7	A ✓✓		
	1.1.8	C ✓✓		
	1.1.9	D ✓✓		
	1.1.10	C ✓✓	(10 x 2)	(20)
1.2	1.2.1	Metaphase II ✓		
	1.2.2	Acrosome ✓		
	1.2.3	Insulin ✓		
	1.2.4	Homeostasis ✓		
	1.2.5	Follicle Stimulating Hormone ✓ / FSH		
	1.2.6	Cytokinesis ✓		
	1.2.7	Fallopian tube ✓ / Oviduct		
	1.2.8	Greenhouse effect ✓		
	1.2.9	Blastocyst ✓/Blastula		
	1.2.10	Amniotic fluid ✓	(10 x 1)	(10)
1.3	1.3.1	A only ✓✓		
	1.3.2	A only ✓✓		
	1.3.3	B only ✓✓		
	1.3.4	A only ✓✓	(4 x 2)	(8)
1.4	1.4.1	Sweat gland ✓		(1)
	1.4.2	Diagrams 2 ✓ and 3 ✓		(2)
	1.4.3	Diagram 3 ✓		(1)
	1.4.4	Diagram 1 ✓		(1)
	1.4.5	Hypothalamus ✓		(1)
1.5	1.5.1	Fishes ✓		(1)
	1.5.2	Chimpanzees, ✓ Humans, ✓ Crocodiles ✓ **(Mark the first TWO only)**		(2)
	1.5.3	Snakes✓,Chickens✓ **(Mark the first ONE only)**		(1)
	1.5.4	Chimpanzees, ✓ Humans, ✓ Whales ✓ **(Mark the first TWO only)**		(2)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 (a) B ✓ (1)

(b) C ✓ (1)

2.1.2
- No vibrations / no transmission of vibrations to the oval window✓
- hence no pressure waves created in the fluid of the cochlea✓
- hearing receptors not stimulated✓
- no impulses reach the cerebrum.✓ (Any 3) (3)

2.1.3 (a) E ✓ B ✓ (2)

(b) C ✓ (1)

2.1.4
- No impulses will be transmitted to the cerebellum ✓ and therefore,
- no sense of balance will be achieved. ✓ / Speed and direction of head ✓movement will not be interpreted to maintain body balance.

(Any 2) (2)

2.2 2.2.1 (a) C ✓ (1)

(b) A ✓ (1)

2.2.2 (a)
- The sperm will not be able to reach the urethra ✓
- therefore, no sperm in semen ✓/ ejaculate/released during ejaculation.
- hence no sperms transferred to vagina ✓
- and no fertilisation will take place. ✓ (Any 3) (3)

2.3 2.3.1 (a) Sclera✓ (1)

(b) Yellow spot ✓ / Fovea centralis / fovea (1)

(c) Choroid ✓ (1)

2.3.2 B ✓ and C ✓ (2)

2.3.3
- Suspensory ligaments are slack✓
- Lens is more convex✓
- Light is refracted more ✓
- Image forms in front of retina ✓/ is blurred (Any 3) (3)

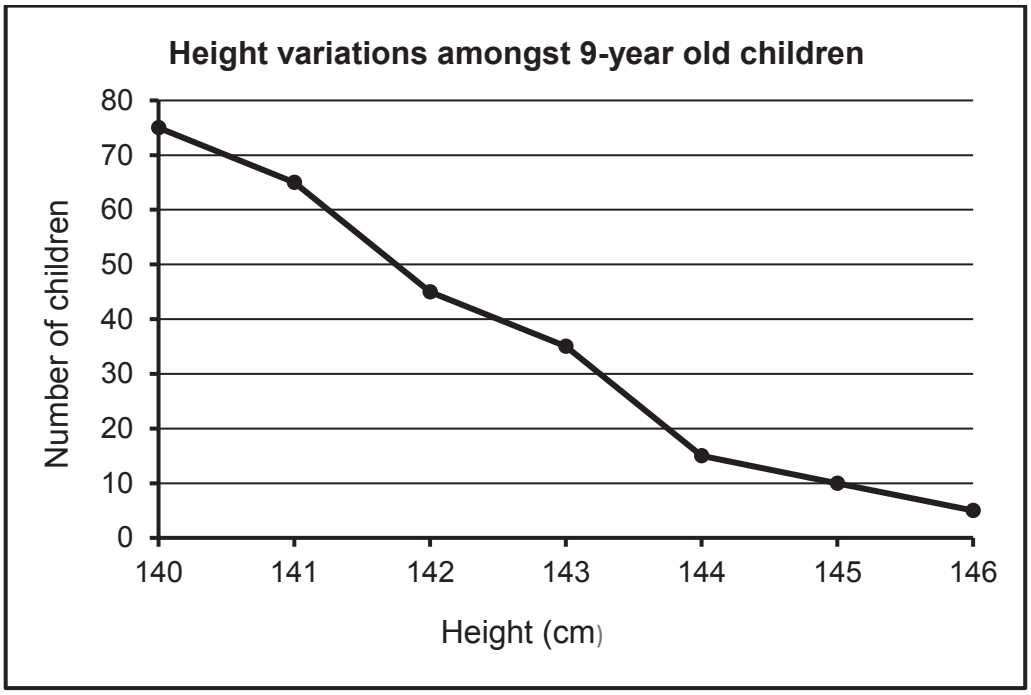
2.3.4
- The powerful laser rays damage the photo-receptors ✓/ rods and cones in the retina
- cannot convert light stimulus to impulses ✓
- no impulses send to cerebrum via optic nerve ✓ (Any 2) (2)

2.4 2.4.1 Growth hormone ✓ (1)

2.4.2 Included many children ✓/ large sample (1)

2.4.3 $\frac{175}{425} \times 100$ ✓ $= 41{,}18\%\ or\ 41{,}2\%$ ✓ (2)

2.4.4



Marking guideline

Caption (C) (both variables included)	1 Mark
Type of graph (T)	1 Mark
X-axis label, unit and scale (X)	1 Mark
Y-axis label and scale (Y)	1 Mark
Plotting of points (P)	0 Mark – No points plotted correctly
	1 Mark – 1 to 6 points plotted correctly
	2 Marks – All points plotted correctly

(6)

2.5 2.5.1 The measure of the total amount of greenhouse gas emissions ✓ of an individual, population or company per year. ✓ (2)

2.5.2 By measuring the consumption of fuels such as petrol, diesel and oil. ✓ (1)

2.5.3
- Educate people about the effects of greenhouse gas emissions. ✓
- Penalise companies whose carbon footprint is too large ✓
- Reforestation to remove excess carbon dioxide from the atmosphere ✓
- Use alternative sources of energy. ✓ (e.g. solar energy etc)
- Introduce programs to promote reusing and recycling by people. ✓

(Mark first TWO only) (Any 2) (2)

[40]

QUESTION 3

3.1 3.1.1 - Umbilical artery ✓
- Umbilical vein ✓ (Any order) (2)

3.1.2

Blood to the foetus	Blood away from the foetus
Contains relatively high concentration of nutrients ✓(Any examples)	Contains relatively low concentration of nutrients ✓
Contains no (metabolic) waste products ✓	Contains high concentration (metabolic) waste products ✓
Contains relatively high concentration of oxygen	Contains relatively low concentration of oxygen
Contains relatively low concentration of carbon dioxide ✓	Contains relatively high concentration of carbon dioxide ✓

(Mark the first ONE only) 1 x 2 + 1 mark for the table (3)

3.1.3 Diffusion ✓ (1)

3.1.4
- The placenta will not be fully functional ✓ / there is less surface area for diffusion and therefore,
- less oxygen/ nutrients will be supplied to foetus ✓
- leading to under development ✓
- causes the accumulation of metabolic waste products ✓ in the foetus/less diffusion of wastes to the mother
- causing blood to be highly toxic ✓and this
- results in the miscarriage / death of the foetus ✓ (Any 3) (3)

3.2 3.2.1 High/low levels of abscisic acid in the seeds inhibits/promotes germination ✓

OR

Abscisic acid has no effect on germination.

OR

Low/high levels of abscisic acid in the seeds inhibits/promotes germination (2)

3.2.2 (a) The percentage germination of seeds ✓ (1)

(b) Presence /absence of abscisic acid ✓ (1)

3.2.3
- Equal number of seeds used in tray **A** and **B** ✓
- Same soil used in both trays ✓
- Seeds were exposed to same environmental conditions ✓/ examples of same environmental conditions
- Data collected from both trays at the same time ✓

(Mark the first TWO only) (Any 2) (2)

3.2.4 0 ng/g ✓/ anything less than 10 ng/g (1)

3.3 3.3.1 Metaphase 1 ✓ (1)

3.3.2 Homologous pairs of chromosomes are arranged on the equator. ✓ (1)

3.3.3
- During prophase1 ✓
- chromatids of homologous chromosomes over lap at chiasmata ✓/ chiasma
- and exchange genetic information ✓ between them
- This process is called crossing over. ✓ (Any 3) (3)

3.3.4
- They have the same length ✓
- Centromeres at the same position
- Have alleles for the same gene at the same locus. ✓

(Mark the first TWO only) (2)

3.4 3.4.1 River **B** ✓ (1)

3.4.2 The indicator changed colour from red to cloudy yellow. ✓ (1)

3.4.3
- Faeces of people / raw sewage gets into the river ✓/ burst sewage pipe releases raw sewage into the river. (1)

3.4.4
- *E. coli* live in the human intestine ✓
- 37˚C is body temperature ✓
- therefore, it is the optimal temperature ✓ for these bacteria for growth and multiplication. (Any 2) (2)

3.4.5
- decrease oxygen in water ✓
- causes decomposition ✓
- which uses oxygen ✓ (Any 2) (2)

3.5 3.5.1 The use of a natural enemy ✓/insect/disease to control its number/ reduce numbers of a pest species. ✓ (2)

3.5.2 As the biological control agent's numbers increase, the number of the pest decreases. ✓✓ (2)

3.5.3
- No harmful chemicals would be used ✓
- which could cause possible damage to the crops ✓/ environment / cause land, water and air pollution and primary consumers/organisms which fed on the crops.

OR

- No damage to rest of environment ✓
- because research is done to ensure the control agent will not become a pest. ✓ (2)

3.6 3.6.1
- Blood glucose level remained very high for a long period of time✓/ Blood glucose level did not drop to its initial value (baseline value) after 2 hours.
- Initial glucose level at time 0 minute is higher in patient **2** than patient **1**. ✓ (2)

3.6.2 - Patient **1** is able to convert glucose into glycogen and store in the liver and muscles ✓
- This glycogen will be converted to glucose when the blood glucose level drops below its normal level. ✓ (2)

[40]

TOTAL SECTION B: 80

SECTION C

QUESTION 4

Reflex action
- The (pain) receptors in the skin are stimulated ✓
- and converted stimulus into an impulse ✓
- The impulse travels via the sensory neuron ✓
- to the spinal cord ✓
- In the spinal cord, the sensory neuron makes a synaptic contact ✓
- with the interneuron. ✓
- Which makes synaptic contact with motor neuron ✓ and
- transmits the impulse
- to the muscles of the leg ✓/ effectors
- The muscles respond by contracting ✓
- causing him to lift the leg ✓
- This is known as reflex action. ✓
- The path of the impulse along each neuron is from dendrite ✓
- to cell body ✓
- to axon ✓ (Any 9) (9)

Significance
- The reflex action allows for al rapid ✓ /quick
- involuntary response ✓ / without thinking about it
- to the stimulus ✓
- to prevent damage to the body ✓ (Any 3) (3)

Neural pathway
- Photo-receptors/rods and cones ✓
- in the retina are stimulated ✓
- by the light/ stimulus
- Nerve impulses are generated ✓ and
- transmitted via optic nerve ✓
- to the cerebrum ✓
- where the image of the crab is interpreted ✓/ vision occurs. (Any 5) (5)

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 provided is relevant to the: - transmission of impulses from receptor to effector through reflex arc to cause a reflex action - description of significance of reflex action - neural pathway describing the transmission of impulses from retina to the cerebrum **There is no irrelevant information.**	All information regarding the: - transmission of impulses from receptor to effector through reflex arc. - significance of reflex action is arranged in a logical manner - neural pathway describing the transmission of impulses from retina to the cerebrum	At least the following points should be included: - description of reflex action **(7/9)** - significance of reflex action **(2/3)** - description of neural pathway **(3/5)** - -
1	**1**	**1**

TOTAL SECTION C: 20
GRAND TOTAL: 150