Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2017

LIFE SCIENCES P1 MARKING GUIDELINE

MARKS: **150**

This marking guideline consists of 7 pages.

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	B ✓✓		
	1.1.6	C ✓✓		
	1.1.7	D ✓✓		
	1.1.8	B ✓✓		
	1.1.9	A ✓✓		
	1.1.10	A ✓✓	(10 × 2)	(20)
1.2	1.2.1	Replication ✓		
	1.2.2	Acrosome ✓		
	1.2.3	Cytokinesis ✓		
	1.2.4	Stimulus ✓		
	1.2.5	Reforestation ✓		
	1.2.6	Testosterone ✓		
	1.2.7	Aquifer ✓		
	1.2.8	Centrioles ✓		
	1.2.9	Desertification ✓		
	1.2.10	Peripheral nervous system ✓	(10 × 1)	(10)
1.3	1.3.1	B only ✓✓		
	1.3.2	B only ✓✓		
	1.3.3	B only ✓✓	(3 × 2)	(6)
1.4	1.4.1	(a) Meiosis ✓		(1)
		(b) Crossing over ✓		(1)
		(c) Prophase I ✓		(1)
		(d) Centromere ✓		(1)
		(e) Chiasma ✓		(1)
		(f) Metaphase I ✓		(1)
	1.4.2	They are the same size and shape ✓		(1)
1.5	1.5.1	Open dump site ✓***/***landfill site		(1)
	1.5.2	Methane ✓	(mark first 1 only)	(1)
	1.5.3	As a source of energy for cooking ✓/heating/lighting/fuel		(1)
	1.5.4	Recycling ✓		(1)
	1.5.5	Glass ✓***/***plastic	(mark first 1 only)	(1)
	1.5.6	Greenhouse gases		(1)
	1.5.7	Breeding spot for micro-organisms ✓/insects/rodents that causes diseases		(1)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 (a) C ✓ (1)

(b) B ✓ (1)

2.1.2 (a) Short sightedness ✓/Myopia (1)

(b) Concave ✓ lens (1)

2.1.3 *Accommodation ✓
- Ciliary muscles contract ✓
- Suspensory ligaments slacken ✓
- Tension on lens decreases ✓
- Lens becomes **more convex** ✓
- Refractive power of lens increases ✓
- A clear image now forms on the retina ✓ (*****Compulsory 1 + any 4) (5)

2.2 2.2.1 Insulin ✓ (1)

2.2.2
- Insufficient amounts or no insulin will be secreted by the pancreas ✓
- and therefore less amounts of glucose will be absorbed by liver and muscle cells ✓
- hence less amount of glucose will be converted to glycogen ✓
- causing an increase in glucose in the blood ✓ (any 3) (3)

2.2.3 Water ✓ will move out/exosmosis of the cells to the blood ✓ results in dehydration✓ of cells leading to underperformance/death of cells. ✓ (any 2) (2)

2.3 2.3.1 Growth of plant shoots ✓ growth response/bending of the tip (1)

2.3.2 Auxins ✓ (1)

2.3.3
- Same environment in which the shoots are placed ✓***/***same intensity of the light
- Same type of shoot used ✓
- Same age of the shoot ✓ (mark first 2) (any 2) (2)

2.3.4 (a) **In investigation A:**
- Light from the right ✓**/**from one side/unilateral light
- caused auxins to move to shaded side of the shoot ✓
- leading to increased cell elongation and division ✓ on the shaded side/There was therefore greater growth on the shaded side ✓
- thus bending the shoot in the direction of the source of light ✓ (3)

(b) **In investigation C:**
- Since there is no light stimulus ✓ from the side (because of the cap) there is no influence on the distribution of auxins ✓**/**auxins evenly distributed below the cap
- therefore the shoot grew upright ✓ (3)

2.3.5
- Repeat the investigation ✓
- Use more than one plant for each treatment ✓/increase sample size (2)

2.4 2.4.1 (a) **A** Ganglion ✓ (1)

(b) **E** Effector ✓/muscle (1)

2.4.2 (a) **B** Ensures one directional flow of impulses ✓ (mark first 1 only) (1)

(b) **C** Transmits impulses from sensory neuron to motor neuron ✓ (mark first 1 only) (1)

2.4.3
- Spinal cord shortens reaction time by sending impulses directly to the effector ✓
- If the brain is involved, it delays the reaction ✓
- causing injury or even death ✓ (3)

2.4.4
- The myelin sheath is damaged by multiple sclerosis ✓
- This will cause a slow transmission of impulses ✓
- resulting in slower reaction time✓ which might leads to injury or death ✓ (any 2) (2)

2.4.5
- The person will be able to feel the pain ✓ because the sensory neuron is able to transmit the impulses to the brain ✓ since it is not damaged
- However no reaction will take place ✓
- because of the fact that no impulse will reach the effector ✓ due to the damage to the motor neuron (4)

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QUESTION 3

3.1 3.1.1 (a) **A** meiosis✓/oogenesis (1)
(b) **B** ovulation✓ (1)

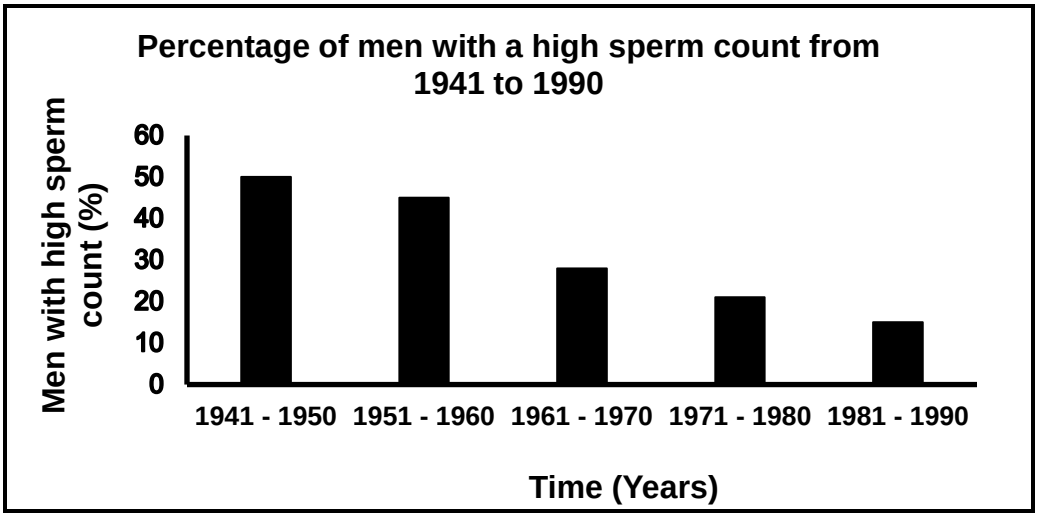
3.1.2
- High level of progesterone in the blood causes the pituitary gland ✓/hypophysis ✓
- to secrete less FSH ✓
- therefore no new Graafian follicles will be formed ✓
- and no ovulation and menstruation will take place ✓ (any 3) (3)

3.1.3
- Under the influence of LH, ✓
- the Graafian follicle ruptures ✓
- and causes ovulation ✓*/*release of the ovum
- The LH converts the empty Graafian follicle ✓
- into the corpus luteum ✓
- The corpus luteum will secrete progesterone ✓ and
- a little oestrogen. ✓ (any 6) (6)

3.2 3.2.1 (a) 1981 – 1990 ✓ (1)
(b) 1981 – 1990 ✓ (1)

3.2.2 % increase = $\frac{4 \times 100}{14}$ ✓ = 28,5% ✓ (2)

3.2.3



Criteria	Mark Allocation
Bar graph drawn (T)	1
Title of graph (C)	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 3 bars plotted correctly 2: All bars plotted correctly

NOTE:
If a line graph is drawn – marks will be **awarded** for the 'title and label for X and Y axes' only
If a histogram is drawn – marks will be **lost** for the 'type of graph and correct scale' only (6)

3.3 3.3.1 C ✓ (1)

3.3.2
- If the patient swims after the grommet was put in, water will enter the middle ear rather to drain out ✓
- This will result in water building up in the middle ear ✓**/**middle ear can't dry out
- which can result in middle ear infection✓/temporary loss of hearing/middle ear infection can't be cleared up. (any 2) (2)

3.3.3
- Three semi-circular canals are positioned in different planes ✓
- so that the head movement in any direction ✓
- can be detected ✓/cause liquid in at least one canal to move ✓ and stimulates cristae ✓ (any 3) (3)

3.3.4
- Eustachian tube ✓
- Equalises air pressure on either side of the tympanic membrane so that air pressure does not cause bursting of the tympanic membrane ✓ (2)

3.4 3.4.1 Pyrite ✓ (1)

3.4.2
- Pyrite mineral deposits are exposed to water and oxygen ✓
- which breaks down (weathers), changes to sulphuric acid ✓ and flows out (2)

3.4.3 (a) **Impact on the infrastructure**
- The acid content causing the rusting of iron in structure ✓
- causing the weakening of bridges and buildings in that area ✓ (2)

(b) **Impact on the agricultural production**
- The pH of the water and soil drops ✓
- which may lead to crop failure ✓

OR

- The acid water causing the leaching of essential nutrients out of the soil ✓
- reducing the fertility of the soil ✓ (any 1 × 2) (2)

3.4.4
- The acid water could kill the aquatic organisms ✓
- causing the death of other species depending on them as food source. ✓
- Decomposition of dead organisms causes an increase in CO_2 level and decrease in O_2. ✓
- The lack of oxygen and food kill remaining organisms in the food chain ✓ (4)

[40]

TOTAL SECTION B: 80

SECTION C

QUESTION 4

***Thermoregulation** ✓
- When environmental temperature is high ✓
- Receptors ✓ in the skin detects this
- Impulses are send to the Hypothalamus ✓
- Which sent impulses to the blood vessels ✓ in the skin ✓
- These blood vessels become wider✓/dilate/increase in diameter/vasodilation
- More blood flows through the skin ✓
- More heat is therefore lost ✓ from the body
- Through radiation ✓
- The sweat glands ✓
- Produce more sweat ✓
- That evaporates ✓ from the skin's surface
- Leading to more heat is lost ✓
- Cooling down the body ✓ (*Compulsory 1 + 9) (10)

- Hypothalamus will respond to information received from osmoreceptors ✓
- To release more ADH into the blood ✓
- Higher concentration of ADH increases the permeability ✓
- of the renal tubules✓/distal convoluted and collecting tubules
- Allowing more water to be reabsorbed from the filtrate ✓
- Passing into the surrounding blood capillaries ✓
- Increasing the quantity of water in the blood ✓
- Less urine will be excreted✓/more concentrated (any 7) (7)

ASSESSING THE PRESENTATION OF THE ESSAY

CRITERION	**RELEVANCE (R)**	**LOGICAL SEQUENCE (L)**	**COMPREHENSIVE (C)**
GENERALLY	All information provided is relevant to the topic	Facts are arranged in a logical/ sequential order	All aspects required by the essay have been sufficiently addressed.
IN THIS ESSAY	Only information with regard to thermoregulation and the role of the hypothalamus regulating water content of the body is given	The sequence of events in thermos-regulation and regulating water content is correct	The role of blood vessels and sweat glands in thermoregulation is given **(7/10**) and the role of ADH **(4/7)**
MARK	**1**	**1**	**1**

Content: (17)
Synthesis: (3)

TOTAL SECTION C: 20
GRAND TOTAL: 150