



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2016

**LIFE SCIENCES P1
MEMORANDUM**

MARKS: 150

This memorandum consists of 8 pages.

SECTION A**QUESTION 1**

- | | | | | |
|-----|--------|----------------------------|----------|------|
| 1.1 | 1.1.1 | B ✓✓ | | |
| | 1.1.2 | B ✓✓ | | |
| | 1.1.3 | A ✓✓ | | |
| | 1.1.4 | A ✓✓ | | |
| | 1.1.5 | B ✓✓ | | |
| | 1.1.6 | D ✓✓ | | |
| | 1.1.7 | A ✓✓ | | |
| | 1.1.8 | B ✓✓ | | |
| | 1.1.9 | C ✓✓ | | |
| | 1.1.10 | A ✓✓ | (10 x 2) | (20) |
| 1.2 | 1.2.1 | Axon ✓ | | |
| | 1.2.2 | Receptors/Sense organs ✓ | | |
| | 1.2.3 | Carbon footprint ✓ | | |
| | 1.2.4 | Deforestation ✓ | | |
| | 1.2.5 | Biodiversity ✓ | | |
| | 1.2.6 | Autonomic nervous system ✓ | | |
| | 1.2.7 | Glucagon ✓ | | |
| | 1.2.8 | Blastocyst ✓/Blastula | | |
| | 1.2.9 | Meninges ✓ | | |
| | 1.2.10 | Cerebellum ✓ | (10 x 1) | (10) |
| 1.3 | 1.3.1 | None ✓✓ | | |
| | 1.3.2 | A only ✓✓ | | |
| | 1.3.3 | B only ✓✓ | (3 x 2) | (6) |
| 1.4 | 1.4.1 | Reflex action ✓ | | (1) |
| | 1.4.2 | (a) A ✓ | | (1) |
| | | (b) F ✓ | | (1) |
| | 1.4.3 | D Synapse ✓ | | (1) |
| | 1.4.4 | (i) E ✓ | | (1) |
| | | (ii) B ✓ | | (1) |
| | | (iii) C ✓ | | (1) |
| 1.5 | 1.5.1 | (a) F ✓ | | (1) |
| | | (b) D ✓ | | (1) |
| | | (c) E ✓ | | (1) |
| | | (d) C ✓ | | (1) |
| | 1.5.2 | (a) 1 Centromere ✓ | | (1) |
| | | (b) 2 Chiasmata ✓ | | (1) |
| | | (c) 3 Chromatid ✓ | | (1) |

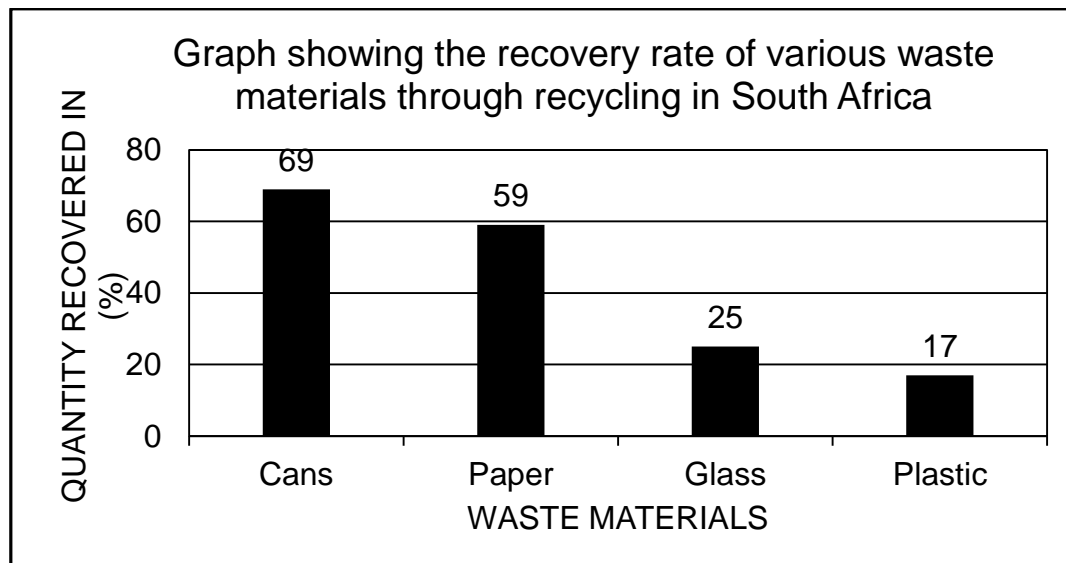
TOTAL SECTION A: 50

SECTION B**QUESTION 2**

- 2.1 2.1.1 (a) A Seminal vesicle ✓
Produces a nutrient-rich ✓ fluid to energise sperm cells (2)
- (b) C Vas deferens ✓ / Sperm duct
Transports the sperm ✓ from the epididymis to the ejaculatory duct/urethra. (2)
- 2.1.2 B Prostate gland ✓ (1)
- 2.1.3 (a) Part E ✓ (1)
- (b) Part D ✓ (1)
- 2.1.4 Penis ✓ (1)
- 2.1.5 No sperm can be released through ✓
the penis which will result in no fertilisation ✓
to take place and no offspring ✓ will be produced/no reproduction. (3)
- 2.2 2.2.1 Boys have faster reaction ✓ time than the girls. ✓ OR
Girls have lower reaction ✓ time than the boys. ✓ OR
Both boys and girls ✓ have the same reaction time. ✓ (2)
- 2.2.2 (a) Reaction time ✓ (1)
- (b) Gender ✓ (1)
- 2.2.3 • Each trial was repeated for 5 times for each of the participants ✓
• relatively large sample size was taken ✓ (about 67% of the class
participated in the trials) (2)
- 2.2.4 • Same group of learners used ✓
• Same person dropping the ruler ✓
• Same meter ruler ✓
• Same time of the day ✓ (Any 2 x 1) (2)
(Mark first two only)
- 2.2.5 Many attempts gives the participants a reasonably good practice session and
therefore, their reaction time improves with practice. ✓ (1)

- 2.3 2.3.1 A site where (solid wastes) domestic and industrial wastes are buried. ✓ (1)
- 2.3.2 R120 000 000 ✓/one hundred and twenty million rands (1)
- 2.3.3
- Energy can be saved ✓by recycling because the raw materials used to manufacture certain waste materials such as glass do not have to be dug from the earth and melted together at very high temperatures.
 - Reduces environmental pollution ✓because manufacturing of new products use large quantities of fossil fuels as a source of energy. (2)
- 2.3.4
- Re-use shopping bags✓/using an item for the same purpose more than once.
 - Reduce ✓/avoiding the purchase of items that have unnecessary packaging around them. (2)
- 2.3.5
- Decomposition of organic ✓/household waste
 - causes the release of greenhouse gases ✓ such as CO₂ and methane
 - that trap more heat from the sun ✓causing increased global warming
 - cause enhanced greenhouse effect. ✓ (Any 2 x 1) (2)

2.3.6



Mark allocation of graph:

Criteria	Mark Allocation
Bar graph drawn (T)	1
Title of graph (C) include both variables	1
Correct scale for X-axis (equal width and spacing of the bars) and Y-axis (S)	1
Correct labels and unit for X-axis and Y-axis (L)	1
Plotting of the bars (P)	0: No bars plotted correctly 1 : 1 to 2 bars plotted correctly 2 : 3 to 4 bars plotted correctly

(6)

NOTE:

If a line graph is drawn – marks will be awarded for the “title and labels for X and Y axis” only

If a histogram is drawn – marks will be lost for the “type of graph and correct scale” only

- 2.3.7 (i) plastic (1)
- (ii) cans (1)
- 2.4 2.4.1 • A karyotype is a computerised diagram ✓ of all the chromosomes. ✓
 • Complete set of chromosomes in a cell (during metaphase) showing the number, size and shape ✓ of all the chromosomes. (Any 1 x 2) (2)
- 2.4.2 Eutrophication is the increase in the amount of nutrients ✓ from various sources, washed into the rivers and water reservoirs ✓ causing excessive growth ✓ of aquatic weeds ✓ and algae. ✓ (Any 2 x 1) (2)

[40]**QUESTION 3**

- 3.1 3.1.1 Tropism ✓ (1)
- 3.1.2 Auxin ✓ (1)
- 3.1.3 • Brings about bending reaction in plants known as tropism ✓
 • Promote cell division ✓
 • Responsible for cell elongation ✓
 • Responsible for apical dominance ✓
 • Promote root development ✓ (Any 2 x 1) (2)
 (Mark first only)
- 3.1.4 It promotes cell elongation ✓ at the growing tip of the stem. (1)
- 3.1.5 • Under the influence of gravity ✓ the auxins tends to accumulate on the lower side of the root. ✓
 • The growth on the lower side is inhibited ✓ by the increased concentration ✓ of auxins.
 • On the upper side of the root the auxin concentration is less, ✓ these cells therefore elongate more ✓ causing
 • the root to bend and grow downwards. ✓ (6)
- 3.2 • When the level of thyroxin is too low ✓
 • the pituitary gland is stimulated ✓
 • to secrete more TSH ✓ and
 • the increased level of TSH ✓ causes
 • the thyroid gland ✓
 • to secrete more thyroxin ✓ and
 • thyroxin level of the blood is raised to the normal level ✓
 • When the thyroxin level of the blood is too high ✓
 • the pituitary gland secretes less TSH ✓
 • little or no thyroxin is secreted ✓ and
 • the thyroxin level is thus reduced to normal limits. (6)

- 3.3 3.3.1 As humans get older, there is a progressive decline in the secretion of growth hormone. ✓✓ (2)
- 3.3.2 The amounts of growth hormone secreted between the ages of 13 and 19 is comparatively higher ✓ than the amounts of hormone secreted during the rest of the life of the person. (1)
- 3.3.3 (a) Gigantism ✓ (1)
- (b) Dwarfism ✓ (1)
- 3.3.4
- The rapid development of stronger muscles ✓
 - Growth in size and mass of skeletal system ✓ (Any 1 x 1) (1)
- 3.4 3.4.1
- The endocrine disrupters/malfunctioning of endocrine glands
 - Life style/life style variations/driving a vehicle for prolonged periods (Any 1 x 1) (1)
- 3.4.2
- Long distance drive extends the period sitting at a fixed position causing male reproductive organ to remain tightly squeezed between the thighs for a considerable period of time. ✓
 - As the temperature rises ✓ in the area, the scrotum is unable to pull the testis away from the body due to lack of spacing,
 - hence the testes remain in contact with the body and maintain a higher temperature causing a disruption of spermatogenesis. ✓ (3)
- 3.4.3 The low sperm count reduces the chances of fertilisation ✓ and may lead to male infertility. ✓ (2)
- 3.4.4
- Use of very tight under wear ✓
 - sitting in a hot water tub for a long time as daily routine. ✓ (Any 1 x 1) (1)
- 3.5 3.5.1 This is the process of maintaining the internal environment ✓ at a constant optimal state ✓ (2)
- 3.5.2 Skin ✓ (1)
- 3.5.3
- Enzymes regulate normal functioning of the body. ✓
 - High temperatures cause the enzymes to denature ✓
 - and low temperatures inactivate ✓ enzymes temporarily. (Any 2 x 1) (2)
- 3.6 3.6.1
- High levels of salts in the body fluids causes the secretion of aldosterone ✓
 - from the adrenal gland ✓
 - decreases. ✓
 - Less sodium is thus reabsorbed ✓ by the blood capillaries
 - allowing more sodium to be excreted ✓
 - The amount of sodium in the blood decreases back to normal ✓ (4)
- 3.6 .2 ADH ✓ (1)

[40]**TOTAL SECTION B: 80**

SECTION C**QUESTION 4****Pupillary mechanism ✓**

- The circular muscles of the iris contract. ✓
 - The radial muscles relax. ✓
 - The pupil constricts. ✓
 - The amount of light entering the eye is reduced. ✓
- (Max 4) (4)

Accommodation ✓ for near vision

- Ciliary muscles contract. ✓
 - The suspensory ligaments become slack. ✓
 - The tension on the lens decreases. ✓
 - The lens becomes more convex. ✓
 - The refractive power of the lens is increased. ✓
 - A clear image of the near object is now formed on retina. ✓
- (Max 5) 5

Role of adrenalin

The excitement and panic triggered the secretion of hormone adrenalin causing:

- An increase in the rate of breathing ✓ so that more oxygen is obtained quickly. ✓
 - Liver to convert more glycogen to glucose. ✓
 - An increase in the rate of heart beat and the blood pressure ✓ so that oxygen, glucose and thyroxin can be carried away quickly to the skeletal muscles and brain. ✓
 - Dilation of blood vessels of muscles, heart and brain ✓ so that more blood can be taken to these parts. ✓
 - Constriction of blood vessels of digestive system and skin ✓ so that less blood is sent to these parts and more blood becomes available for heart, brain and skeletal muscles. ✓
 - An increase in the tone of skeletal muscles ✓ so that they can function more effectively. ✓
 - Increases the metabolic rate of the cells in the brain and skeletal muscles ✓ so that more energy is released for muscular activity and clear thought. ✓
- (Any 4 x 2) (8)

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 relevant to the pupillary mechanism, accommodation for the near vision and the role of adrenalin is discussed. (Candidates must not be penalised if they describe accommodation for both distant vision and near vision)	Description of pupillary mechanism and accommodation for the near vision discussed in a logical sequence. The role of adrenalin is explained in a cause and effect format.	Sufficient information provided in describing pupillary mechanism. (2/4) Sufficient information provided in describing accommodation for near vision provided. (3/5) Sufficient explanation of the role of adrenalin provided. (6/8)
MARK	1	1	1

Content: (17)

Synthesis: (3)

TOTAL SECTION C: 20**GRAND TOTAL: 150**