



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

**LIFE SCIENCES P2
FEBRUARY/MARCH 2010
MEMORANDUM**

MARKS: 150

This memorandum consists of 11 pages.

SECTION A**QUESTION 1****1.1**

1.1.1 A✓✓

1.1.2 C✓✓

1.1.3 B✓✓

1.1.4 D✓✓

1.1.5 C✓✓

(5 x 2) **(10)****1.2**

1.2.1 Pollutants✓

1.2.2 Eutrophication✓

1.2.3 Variation✓

1.2.4 Fossils

1.2.5 Vestigial structures✓

1.2.6 Phylogenetic tree✓/cladogram/phylogeny

1.2.7 Mutation✓

1.2.8 Crossing over ✓

(8 x 1) **(8)****1.3**

1.3.1 Both A and B✓✓/A and B

1.3.2 A only✓✓/A

1.3.3 A only✓✓/A

1.3.4 B only✓✓/B

1.3.5 B only✓✓/B

1.3.6 B only✓✓/B

1.3.7 Both A and B✓✓/A and B

(7 x 2) **(14)****14**

1.4.1 5✓ mya✓

(2)

1.4.2 Chimpanzee✓

(1)

1.4.3 98,6✓%✓

(2)

(5)

1.5

- 1.5.1 Paleozoic Era ✓ (1)
- 1.5.2 (a) Paleozoic Era ✓ (1)
- (b) Permian ✓ (1)
- 1.5.3 Cenozoic ✓ (1)
- 1.5.4 (a) 65 ✓ mya (1)
- (b) Comet ✓ / star / meteorite / asteroid (1)
- (c) Extraterrestrial object hit the earth
Climate change occurred – due to dust clouds ✓
Sunlight was blocked ✓
Ice age occurred ✓
Reduction of CO₂ in the atmosphere ✓
Photosynthesis decreased ✓
Many plants died ✓
Many animals died ✓ / dinosaurs become extinct max. (4)
- 1.5.5 Uranium ✓ will be used, because dinosaurs lived approximately 65 million ✓
years ago and C¹⁴ can only measure up to 5 730 ✓ years ago (3)
- (13)**

TOTAL SECTION A: 50

SECTION B**QUESTION 2**

- 2.1**
- There was variation✓ with regard to the feet within the ancestral duck populations
 - Some ancestral ducks had skin✓ attached between the toes
 - As food became scarce✓/environment changed
 - Competition for food increased✓
 - Those ducks which had skin attached between their toes✓/desired characteristic could swim better
 - To secure food and survived✓
 - Those ducks that did not have skin attached between their toes were unable to swim well✓
 - Did not secure food and died✓
 - Through natural selection entire populations✓ of ducks with webbed feet evolved
- any (7)
- 2.2**
- 2.2.1 If you use organs/structures repeatedly✓ it develops✓/and organs and structures that are not used✓, disappear✓
- Acquired✓ characteristics are inherited✓ (4)
- 2.2.2 Acquired characteristics✓ are not inherited✓/only characteristics that are controlled by the genes✓ are inherited✓ (2)
- (6)**
- 2.3**
- 2.3.1 People need firewood ✓ for cooking and staying warm (1)
- 2.3.2
- Land is not deforested✓ because the need for firewood would be less so soil is not eroded✓
 - CO₂/O₂ balance✓ is not upset ✓
 - People/women do not need to spend time✓ to collect firewood for fuel✓
 - Poor people can't afford✓ the more expensive types of fuels such as gas, so they make use of waste of banana plants to produce their own fuel ✓
 - Burning organic matter from the banana plant produces less pollution✓ than burning fossil fuels✓ which give off e.g. SO₂
 - Making fuel bricks out of organic waste✓ creates jobs to reduce poverty✓/recycle waste
- (3 x 2) (6)
- (Mark first THREE only)**
- 2.3.3 To ensure that they do not create other problems such as more pollution/toxic gases✓
- To ensure that it is cost-effective✓
- To ensure that it is a sustainable venture✓
- To ensure that there are no unexpected negative effects ✓
- any (2)
- (9)**
- (Mark first TWO only)**

2.4

- 2.4.1 High sewage level✓ makes bacteria reproduce rapidly/anaerobic bacteria flourish in sewage (1)
- 2.4.2 The concentration of dissolved oxygen decreased✓ after the the point of entry up to 300 m✓ downstream and then increases✓ further downstream any (2)
- 2.4.3 Initially the bacteria population increases✓ resulting in a decrease of the oxygen level✓ close to the point of entry of sewage Eutrophication✓ took place downstream the number of algae increased✓ which releases more oxygen✓ during photosynthesis Therefore water became re-oxygenated✓ any (3)
- 2.4.4 Proper sanitation✓
Sewage must be purified before it enters the river✓
Education✓ to make people aware of proper waste disposal measures
Research✓ – more efficient ways of treating sewage
(Mark first TWO only) any (2)
(8)
[30]

QUESTION 3**3.1**

3.1.1 Pain✓
Complications with pregnancies✓
Heal sores✓
Skin problems✓ any (2)
(Mark first TWO only)

3.1.2 If the number of devil's claw plants is reduced, the smaller animals herbivores that eat it will decrease in numbers✓,
The carnivores that rely on the herbivores will also decrease in number✓
The energy flow through the habitat will be reduced/changed✓ (3)

3.1.3 By establishing nurseries✓ to grow the plants
Legislation on the amounts to be harvested✓
Monitoring✓/policing the harvesting
Collecting only the amount one requires✓
Re-planting the main root after the secondary tubers have been removed✓
Educating ✓collectors on sustainable harvesting methods any (2)
(Mark first TWO only)

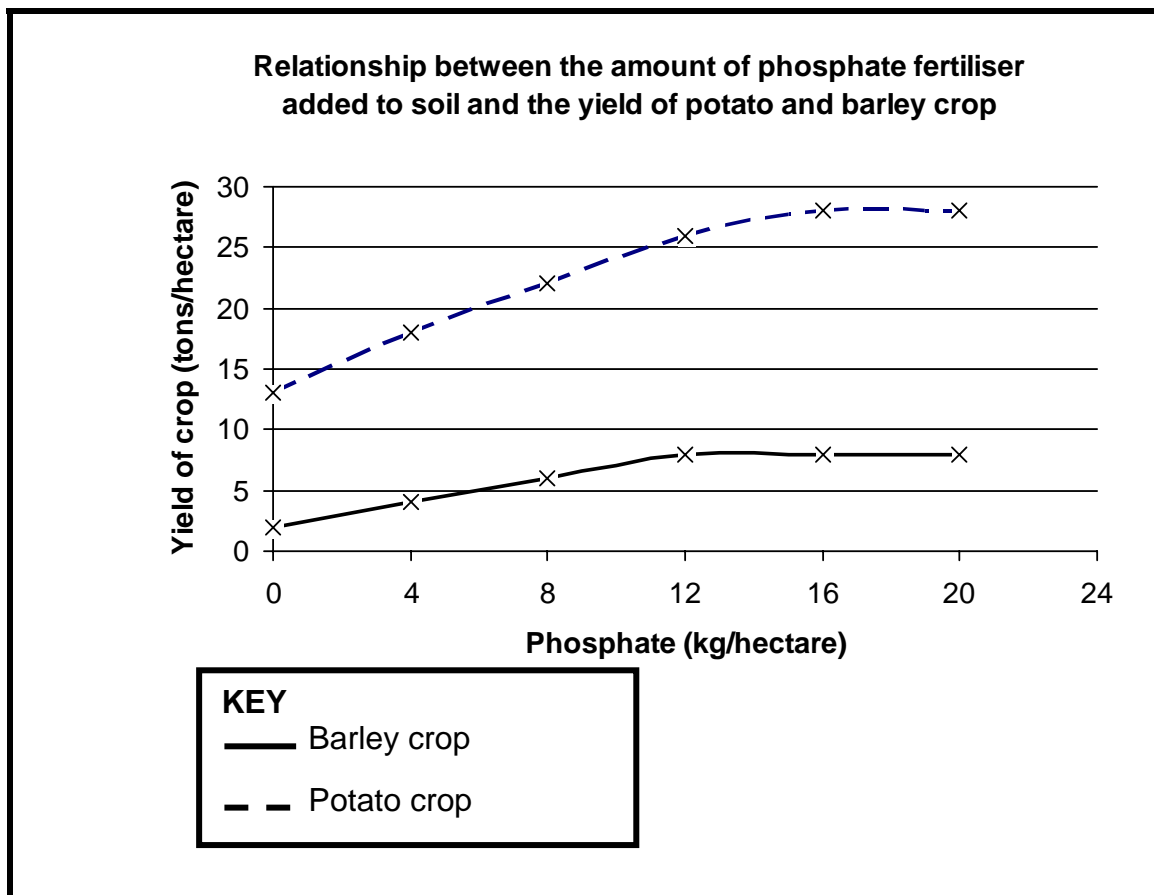
3.1.4 The Khoisan people were the first✓ to use devil's claw for medicinal purposes
Pharmaceutical companies must acknowledge and compensate the Khoisan people for their indigenous knowledge✓/intellectual property (2)
(9)

3.2

3.2.1 Speciation ✓ (1)

3.2.2 The population of species A has split up into two
The sea forms a physical barrier✓
and each group adapts to the new environmental factors✓
Each group undergoes natural selection independently✓
and develops separately
Each group may become genotypically✓
and phenotypically different✓
Might prevent them from interbreeding✓ when they come into contact again/become reproductively isolated leading to the formation of a new species (5)
(6)

3.3
3.3.1



Rubric for the mark allocation of the graph

Correct type of graph	1
Caption of graph	1
Correct label for X-axis including unit	1
Correct label for Y-axis including unit	1
Key provided for 2 graphs	1
Appropriate scale for X-axis	1
Appropriate scale for Y-axis	1
Drawing of graphs	1 – 1 to 5 points plotted correctly 2 – 6 to 11 points plotted correctly 3 – all 12 points plotted correctly
All points joined for graph A and graph B	1

NOTE:

If the wrong type of graph is drawn:

- marks will be lost for "correct type of graph"
- marks will be lost for joining of points

If graphs are not drawn on the same system of axes:

- mark the first graph only using the given criteria

If axes are transposed:

- marks will be lost only for labelling of X-axis and Y-axis (11)

3.3.2 12✓ kg/hectare✓ (2)

3.3.3 It's wasteful✓/ costly
Increased run-off of phosphate into rivers/dams/ponds/lakes/sea✓/
eutrophication/pollution
(Mark first TWO only) (2)
(15)
[30]

TOTAL SECTION B: 60

SECTION C**QUESTION 4****4.1**

4.1.1 An increase/decrease in the concentration of sodium disulphate✓ will result in an increase/decrease in the percentage germination✓ of oats seeds

OR

An increase/decrease in the concentration of sodium disulphate✓
Will have no effect on the percentage germination of oats seeds✓ (2)

4.1.2 Concentration of sodium disulphate(IV) ✓ (1)

4.1.3 Temperature✓
Water✓ (2)
(Mark first TWO only)

4.1.4 Average estimate✓increases reliability ✓ (2)

4.1.5 $12+13+14+11+12✓ / 62/100$
 $= 62%✓$ (2)

4.1.6 When oats seeds were germinated in 0,00% concentration of sodium disulphate germination percentage was high✓ compared to when germinated in 2,50% concentration of sodium disulphate✓ (2)

4.1.7 Increasing concentrations of sodium disulphate✓ decreased the germination of oats seeds✓ After 2.50% no seeds germinated✓ (2)
(13)

4.2

4.2.1

<i>Homo sapiens</i>	<i>A. africanus</i>
1 No prominent brow ridge✓	1 Prominent brow ridge present✓
2 Flat face✓	2 Prognathous face✓
3 More rounded skull✓	3 Less rounded skull✓
4 Teeth arranged on a gentle(round) curve✓/more rounded upper jaw	4 Teeth arranged in a less curved way✓/less rounded upper jaw
5 Smaller upper jaw✓	5 Larger upper jaw✓
6 Smaller cheekbone	6 Larger cheekbone
7 Deeper set eye sockets	7 Shallower set eye sockets

(Mark first THREE only)**(3x2 + 1 for table) (7)**

4.2.2 Little foot✓
Mrs Ples✓
Taung child✓ (3)
(Mark first THREE only)

4.2.3 Foramen magnum of the australopithecine was towards
the centre✓ indicating that these were the first bipedal hominids ✓
on Earth
OR
Large jaws✓ indicate a mainly vegetarian diet✓ (2)
(12)

4.3 Possible answer

Consequences of over fishing to humans and the environment

Species can become extinct✓
Loss of biodiversity✓
Fish start to decline✓
Decrease in products using fish✓
People will lose their jobs✓
Shortage of food✓/leading to starvation
Reduced opportunities for ecotourism✓
Upset the balance of ecosystems✓/Food chains/webs can be destroyed
(Mark first FOUR only) any (4)

Management strategies to prevent overexploitation

Limit the size of fish caught✓ only catch those that have already
reproduced✓
Limit the number/quotas of fish caught✓ to prevent the population
from decreasing rapidly✓
Limit the fishing area✓ to protect some areas so that the population
does not die out✓
Limited fishing /minimal or no fishing ✓ during breeding season✓
License to fish✓ to be able to monitor✓
Develop legislation✓ to regulate fishing✓/heavy penalties for
flouting the legislation
Scientific research✓ to inform legislation✓
Education and awareness✓ of role fish play in the ecosystem✓/
endangered species
Encourage mariculture✓ for food/prevent extinction✓
Discouraging illegal market✓ by government selling it at lower price✓/
subsidy
(Mark first FOUR only) any 4 x 2 (8)
(12)
Synthesis (3)
(15)

ASSESSING THE PRESENTATION OF THE ESSAY

MARKS	DESCRIPTIONS
3	Well-structured – demonstrates insight and understanding of question All FOUR management strategies linked to consequences
2	Minor gaps in the logic and flow of the answer TWO to THREE management strategies linked to consequences
1	Attempted but with significant gaps in the logic and flow of the answer Only ONE management strategy linked to consequences/no link to consequences
0	Not attempted/nothing written other than question number

TOTAL SECTION C: 40**GRAND TOTAL: 150**