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 CO_2 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 C ^{14} 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✓
- CO_2/O_2 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. SO_2
- 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)
(Mark first TWO only) **(9)**

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)

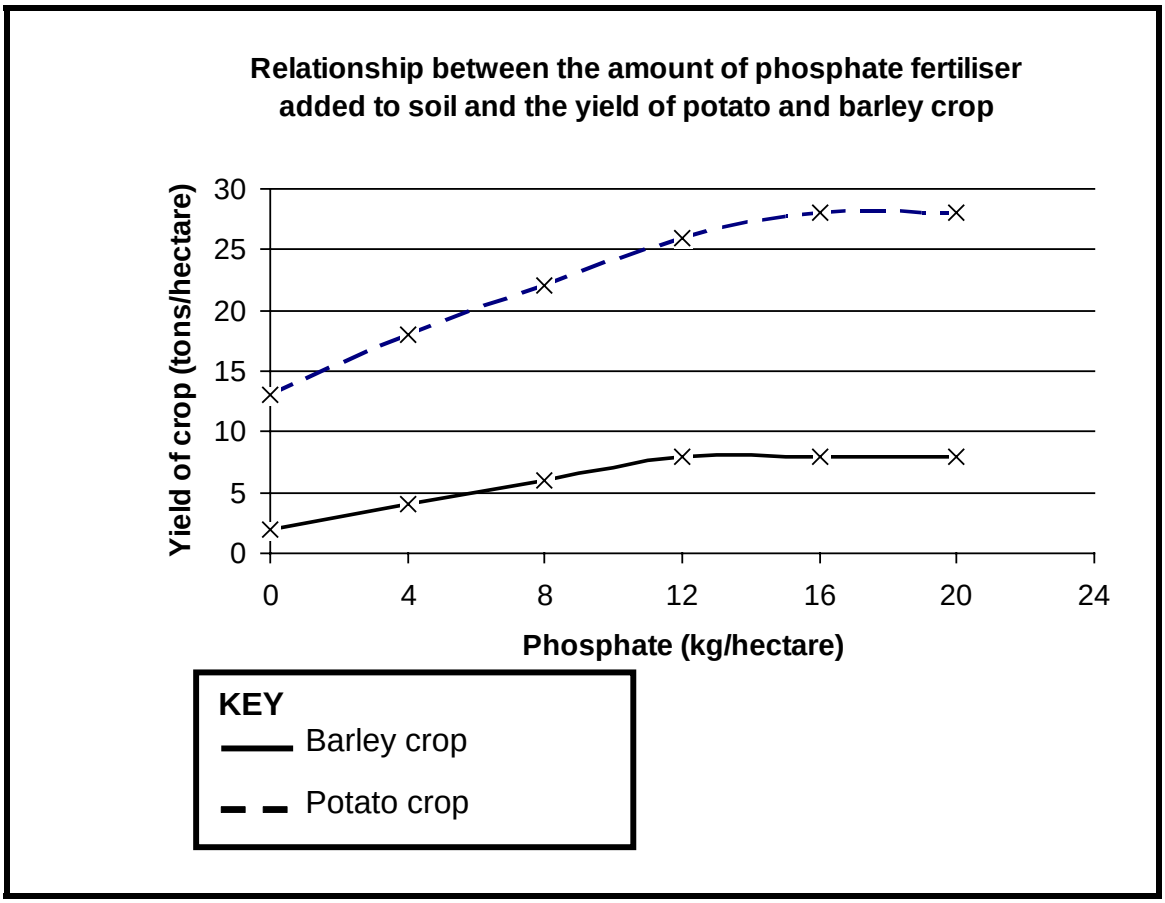
3.2

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

Homo sapiens	***A. africanus***
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