basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 10

LIFE SCIENCES P2

EXEMPLAR 2012

MEMORANDUM

MARKS: 150

This memorandum consists of 8 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES 2012

1. **If more information is given than marks allocated**
   Stop marking when maximum marks are reached and put a wavy line and 'max' in the right-hand margin.

2. **If, for example, three reasons are required and five are given**
   Mark the first three irrespective of whether all or some are correct/incorrect.

3. **If whole process is given when only part of it is required**
   Read all and credit relevant part.

4. **If comparisons are asked for and descriptions are given**
   Accept if differences/similarities are clear.

5. **If tabulation is required but paragraphs are given**
   Candidates will lose marks for not tabulating.

6. **If diagrams are given with annotations when descriptions are required**
   Candidates will lose marks.

7. **If flow charts are given instead of descriptions**
   Candidates will lose marks.

8. **If sequence is muddled and links do not make sense**
   Where sequence and links are correct, credit. Where sequence and links are incorrect, do not credit. If sequence and links become correct again, resume credit.

9. **Non-recognised abbreviations**
   Accept if first defined in answer. If not defined, do not credit the unrecognised abbreviation but credit the rest of answer if correct.

10. **Wrong numbering**
    If answer fits into the correct sequence of questions but the wrong number is given, it is acceptable.

11. **If language used changes the intended meaning**
    Do not accept.

12. **Spelling errors**
    If recognisable accept, provided it does not mean something else in Life Sciences or if it is out of context**.**

13. **If common names given in terminology**
    Accept, provided it was accepted at the national memo discussion.

14. **If only letter is asked for and only name is given (and vice versa)**
    No credit.

15. **If units are not given in measurements**
    Candidates will lose marks. Memorandum will allocate marks for units separately.

16. Be sensitive to the **sense of an answer, which may be stated in a different way**.

17. **Caption**
    All illustrations (diagrams, graphs, tables, etc.) must have a caption.

SECTION A

QUESTION 1

1.1	1.1.1	D✓✓		
	1.1.2	C✓✓		
	1.1.3	D✓✓		
	1.1.4	A✓✓		
	1.1.5	D ✓✓		
	1.1.6	B✓✓		
	1.1.7	D✓✓		
	1.1.8	B✓✓		
	1.1.9	B✓✓	(9 x 2)	**(18)**
1.2	1.2.1	Xerophytes✓		
	1.2.2	Food web✓		
	1.2.3	Acids✓		
	1.2.4	Pericardium✓		
	1.2.5	Bypass✓		
	1.2.6	Altitude✓		
	1.2.7	Biodiversity✓		
	1.2.8	Geologic timescale✓		
	1.2.9	Sterkfontein caves✓		
	1.2.10	Extinction✓	(10 x 1)	**(10)**
1.3	1.3.1	A only✓✓		
	1.3.2	A only ✓✓		
	1.3.3	B only ✓✓		
	1.3.4	Both A and B✓✓		
	1.3.5	Both A and B ✓✓		
	1.3.6	B only✓✓		
	1.3.7	B only✓✓		
	1.3.8	B only✓✓		
	1.3.9	A only✓✓		
	1.3.10	A only✓✓		
	1.3.11	Both A and B ✓✓	(11 x 2)	**(22)**

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 (a) Greenfly ✓

(b) Rose ✓ (2)

2.1.2 Energy passed to greenfly = 1 000 kJ/m^2/year x $\frac{10}{100}$ ✓

= (100 kJ /m^2/year)✓

Energy passed to ladybird = 100 kJ/m^2/year x $\frac{10}{100}$

= (10 kJ/m^2/year)✓

Energy passed to blackbird = 10 kJ/m^2/year x $\frac{10}{100}$

= (1 kJ/m^2/year)✓ (4)

2.1.3 (a) Increase ✓– not eaten by greenflies✓ (2)
(b) Decrease✓ – no food for them to eat✓ (2)
(c) Decrease ✓– as ladybirds die, no food for them also✓ (2)
(12)

2.2 2.2.1 (a) A✓ (1)
(b) B✓ (1)
(c) C✓ (1)

2.2.2 Soil becomes waterlogged✓; roots of the plants can rot✓ (2)

2.2.3 - Fine soil particles✓ that are
- closely packed✓ (2)

2.2.4 - Improves the aeration✓ of the soil
- Increases the water-retaining ability✓ of the soil
- Improves the mineral content✓ of the soil (any 2) (2)
(9)

2.3	2.3.1	Fynbos✓	(1)
	2.3.2	A region with a specific climate together with the plants and animals that live in it✓	(1)
	2.3.3	- Urban expansion✓ - Clearing agricultural land✓ - Harvesting natural resources for industrial use✓ (any 2)	(2)
	2.3.4	- Prevent extinction of species✓ - Preserve natural resources✓ - Economic benefit for humans✓ (any 2)	(2)
	2.3.5	9 000✓ x $\frac{70}{100}$ ✓ = 6 300✓ species	(3)
	2.3.6	Ecotourism✓	(1)
	2.3.7	- Creates jobs/business opportunities for local people✓ - Creates awareness of the environment through education✓	(2) **(12)**
2.4	2.4.1	Diagram A	(1)
	2.4.2	- It has thick muscular wall✓to withstand the pressure exerted by the pumping action of the heart✓ - The lumen is smaller in diameter✓to facilitate faster movement of blood✓/Creates higher pressure (any 1 x 2)	(2)
	2.4.3	B ✓	(1)
	2.4.4	(a) Connective tissue✓ (b) Muscle ✓layer (c) Lumen✓	(1) (1) (1) **(7)**
			[40]

QUESTION 3

3.1 3.1.1 *Archaeopteryx* ✓(and✓ for underlining to show it is a scientific name) (2)

3.1.2 A skull with teeth and jaws✓ more similar to dinosaurs✓
Had three claws on the end of the bones of each wings✓ more similar to dinosaurs✓ (any 1 x 2) (2)
AND
Had feathers✓ more similar to birds✓
Had three forward-pointing toes and one backward pointing toe✓ more similar to birds✓ (any 1 x 2) (2)

3.1.3 The organism had died next to the flood plain✓
Sediments ✓piled up over the organism reducing oxygen flow✓
Soft parts decayed✓
Over time minerals seeped into the bones✓ replacing the organic part✓ (any 4) (4)

3.1.4 *Trinaxodon*✓ in the Karoo✓ (2)
(12)

3.2 3.2.1 Radiometric dating✓
Relative dating✓ (2)

3.2.2 (a) X = 28 650✓ mya✓ (2)

(b) Z = 3,125 ✓%✓ (2)

3.2.3 After 60 million years✓ there is no more carbon-14 remaining✓ in the fossil (2)

3.2.4 Not all organisms become fossilised✓
Some fossils might not have been found✓ (2)
(10)

3.3 3.3.1 (Accept any value from) 55–60✓million years ago✓/mya (2)

3.3.2 Permian✓ extinction (1)

3.3.3 400✓ – 200✓ = 200✓ families of species
OR
400✓ – (210 to 230)✓ = (190 to170)✓ families of species (3)

3.3.4 The extinction of a large number of families resulted in the availability of empty niches ✓ that could be filled by surviving✓species. These species are able to survive✓ best in these new niches and form new species✓ (any 3) (3)
(9)

3.4	3.4.1	Fossil✓evidence/Paleontological studies	(1)
	3.4.2	65✓million years ago✓/mya	(2)
	3.4.3	- A comet, an asteroid or part of a star✓ from outer space struck the Earth/Gulf of Mexico, which resulted in - large clouds of dust blocking out the sun✓ - which stopped photosynthesis✓ - and also caused global cooling✓/dinosaurs might have been ectotherms and not able to live in the cold - Also led to world-wide fires✓ - and monstrous tsunamis✓ (any 6)	(6) **(9)** **[40]**

TOTAL SECTION B: 80

SECTION C

QUESTION 4

Pulmonary circulation

- Deoxygenated blood ✓flows from the right atrium✓
- through the tricuspid valves✓ into the right ventricle✓
- When the ventricles **contract** ✓during systole✓
- deoxygenated blood from the right ventricle
- is pumped pass the semi-lunar valve✓
- into the pulmonary artery✓ - which branches into two arteries✓ entering each lung
- In the lung capillaries ✓ carbon dioxide diffuse out of the blood ✓ into the lungs and
- oxygen diffuses into the blood✓
- The capillaries unite to form venules✓
- which eventually form four pulmonary veins✓ leaving the lungs carrying oxygenated blood✓ back to the heart
- through the left atrium✓. (any 13) (13)

- Heart has the semi-lunar valves✓ between pulmonary artery and right ventricle to prevent the back flow of blood into the ventricles✓
- Heart has the tricuspid valves✓ between right atrium and right ventricle to prevent the back flow of blood into the right atrium✓
- Has a septum ✓which prevents mixing of blood in the ventricles/ atria✓
- Walls are made up of cardiac muscles✓ which allows the constant contraction and relaxation✓ (any 2 x 2) (4)

(17)

Marks	Descriptions
3	Well structured – demonstrates insight and understanding of question
2	Minor gaps or irrelevant information in the logic and flow of the answer
1	Significant gaps or irrelevant information in the logic and flow of the answer
0	Not attempted/nothing written other than question number/no relevant information

Synthesis (3)

TOTAL SECTION C: 20
GRAND TOTAL: 150