NATIONAL SENIOR CERTIFICATE

GRADE 10

NOVEMBER 2017

LIFE SCIENCES P2 MARKING GUIDELINE

MARKS: **150**

This marking guideline consists of 10 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES

1. **If more information than marks allocated is given**

   Stop marking when maximum marks is reached and put a wav 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 are given in terminology**

    Accept provided it was accepted at the memo discussion meeting.

14. **If only letter is asked for and only name is given (and vice versa).**

    Do not credit.

15. **If units are not given in measurements**

    Candidates will lose marks. Marking guideline 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.

18. **Code-switching of official languages (terms and concepts)**

    A single word or two that appears in any official language other than the learners' assessment language used to the greatest extent in his/her answers should be credited, if it is correct. A marker that is proficient in the relevant official language should be consulted. This is applicable to all official languages.

19. **Changes to the marking guideline**

    No changes must be made to the marking guideline without consulting the examiner.

SECTION A

QUESTION 1

1.1	1.1.1	C ✓✓			
	1.1.2	A ✓✓			
	1.1.3	D ✓✓			
	1.1.4	C ✓✓			
	1.1.5	C ✓✓			
	1.1.6	D ✓✓			
	1.1.7	B ✓✓			
	1.1.8	A ✓✓			
	1.1.9	A ✓✓			
	1.1.10	B ✓✓		(10 x 2)	(20)
1.2	1.2.1	Septum ✓			
	1.2.2	Biodiversity ✓			
	1.2.3	Glaciation ✓			
	1.2.4	Veins ✓			
	1.2.5	Coelacanth ✓			
	1.2.6	Geological ✓ timescale			
	1.2.7	Palaeontologist ✓			
	1.2.8	Atmosphere ✓			
	1.2.9	Tissue fluid ✓		(9 x 1)	(9)
1.3	1.3.1	A only ✓✓			
	1.3.2	Both A and B ✓✓			
	1.3.3	A only ✓✓		(3 x 2)	(6)
1.4	1.4.1	A – Transpiration ✓			
		B – Evaporation ✓			
		C – Condensation ✓			
		D – Precipitation ✓		(4 x 1)	(4)
	1.4.2	Agriculture / Farming ✓			
		Industry / Manufacturing ✓			
		Building dams ✓	(Any 1 x 1)	**Mark first ONE only**	(1)
	1.4.3	Temperature ✓			(1)
1.5	1.5.1	1 – Aorta ✓			
		2 – Superior Vena Cava ✓			(2)
	1.5.2	5 ✓ and 7 ✓			(2)
	1.5.3	6 ✓ – Tricuspid valve ✓			(2)
	1.5.4	Cardiac muscle ✓			(1)
	1.5.5	It is protected by the: Sternum ✓			
		Ribcage ✓			
		Fat ✓			
		Pericardium ✓		(Any 2 x 1)	(2)
				TOTAL SECTION A:	**50**

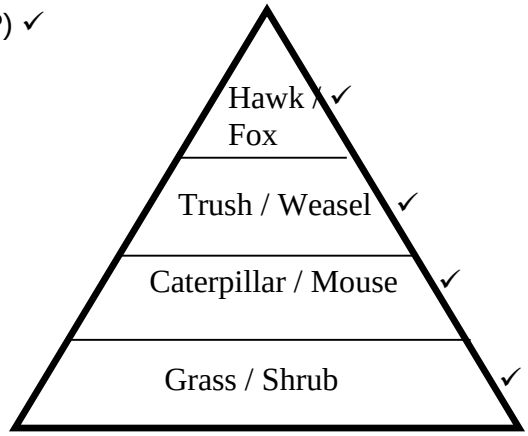
SECTION B

QUESTION 2

2.1 2.1.1 (a) Grass✓ / Shrub (1)
(b) Thrush ✓ / Hawk ✓ / Fox / Weasel (Any 2 x 1)
Mark first TWO only (2)

2.1.2 Mark allocation: Heading ✓
Correct organisms filled in at each level according to the given food chain ✓✓✓✓
Trophic levels labelled (T) ✓
Pyramid shape drawn (P) ✓

(P) ✓ (T) ✓



Food Pyramid of Energy ✓ (7)

2.1.3 The number of mice would not decrease ✓ as quickly because only one predator was removed.✓
OR
The number of rabbits and squirrels will decrease ✓faster since the fox must look for another source of food. ✓ (2)

2.2 2.2.1
- Leaves are thick and fleshy ✓– to reduce transpiration rate ✓
- Leaves have a thick cuticle ✓ – to reduce transpiration rate ✓
- Leaves have thorns on them ✓– to reduce transpiration rate ✓
- Leaves have sunken stomata✓ – to reduce transpiration rate.✓

(Any 1 x 2) (2)

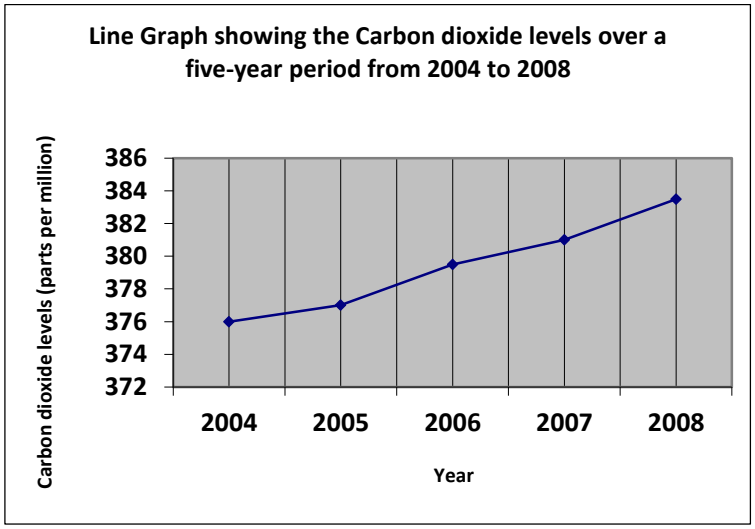
2.2.2 The North-facing slope receives more direct sunlight ✓ and is drier than the South-facing slope✓/are warmer ✓ due to evaporation✓ (2)

2.2.3 (a) Aspect is the direction that the slope is facing.✓ (1)
(b) Altitude is the height above sea level. ✓ (1)

2.2.4
- Sunlight ✓/Climate
- Aspect ✓/ Slope
- Altitude ✓
- Soil ✓

(Any 2 x 1) (2)
Mark first TWO only

2.3 2.3.1



Mark Allocation: Heading ✓
Type of graph ✓
Y-axis label and scale ✓
X-axis label and scale ✓
Plotting: 1 – 4 points correct ✓
All 5 points correct ✓✓ (6)

2.3.2 The carbon dioxide level increases ✓ each year/ as the years increase ✓ (2)

2.3.3 Carbon dioxide level ✓ (1)

2.3.4 383,5 – 376,0 ✓ = 7,5 parts per million* ✓ (***compulsory**) (2)

2.3.5
- An increase in carbon dioxide in the atmosphere absorbs the heat energy / acts like a blanket ✓
- trapping the heat and preventing it from escaping into outer space. ✓
- The Earth's temperature therefore rises. ✓
- This is called global warming. ✓
- This leads to climate change. (Any 4 x 1) (4)

2.3.6 (a)
- Burning of wood / fossil fuels ✓ for heat
- Deforestation ✓ for agriculture, factories, papers etc. (any acceptable example)
- Driving motor vehicles ✓ / using petrol or diesel
- Using electricity ✓ from coal-powered station
- Form lift clubs
- (Any other relevant answer.) (Any 3 x 1) (3)

Mark first THREE only

(b)
- Walk instead of drive ✓
- Use less electricity ✓
- Buy locally produced goods ✓
- Reduce / re-use / recycle ✓ (Any 2 x 1) (2)

Mark first TWO only

[40]

QUESTION 3

3.1 3.1.1 A – Baboon✓
B – African Penguin ✓
C – Leopard ✓
D – Elephant ✓ (4 x 1) (4)

3.2 3.2.1 5 ✓ (1)

3.2.2 Permian ✓ (1)

3.2.3 Palaeozoic ✓ (1)

3.2.4
- Volcanic activity ✓
- Asteroid / comet impact ✓
- Climate change ✓
- Glaciation ✓ / drop in sea levels (2)

3.2.5 200 mya***** ✓ **(*Compulsory)** (1)

3.2.6 Permian ✓ (1)

3.2.7 Exploitation of the environment by humans ✓ (1)

3.3 3.3.1 Biogeography ✓ (1)

3.3.2 Gondwanaland ✓ (1)

3.3.3
- According to the theory all continents were originally one big mass / super continent ✓ called Pangaea.
- This continent broke up over a period of time into two large masses (Laurasia and Gondwanaland). ✓
- They broke up into all the continents we have today ✓/Laurasia broke up into North America, Europe, Middle East, Asia and China and Gondwanaland broke up into South America, Africa, Madagascar, Australia, India, and Antarctica. (3)

3.3.4 No ✓ (1)

3.3.5 Giant anteaters belong to the genus <u>Myrmecophaga</u> ✓
and armadillos belong to the genus <u>Dasypus</u> ✓ (2)

3.3.6 <u>Dasypus</u> <u>novemcinctus</u> ✓ (Must be underlined separately) ✓ (2)

3.4
- Scientists think that oxygen was absent in the early atmosphere. ✓
- This absence allowed organic molecules which are the building blocks of living organisms to form. ✓
- The first life forms did not require oxygen / were anaerobic. ✓
- Then bacteria which could photosynthesize developed. ✓
- They released oxygen into the atmosphere / increased the oxygen level in the atmosphere. ✓
- As oxygen levels increase, organisms that depended on oxygen / aerobic organisms developed. ✓
- The absence of oxygen led to the creation of life. ✓
  but the increase in oxygen levels led to an increase in the diversity of life. ✓ (Any 5 x 1) (5)

3.5 3.5.1 A – General diastole ✓
B – Atrial systole ✓
C – Ventricular systole ✓ (3)

3.5.2
- The two atria contract ✓ at the same time
- The tricuspid ✓ and bicuspid valves open ✓
- Blood flows into the two ventricles ✓ (4)

3.5.3 Sino-atrial node ✓ / SA node (1)

3.5.4 0,8 sec ✓ (1)

3.5.5
- Receptor cells in the carotid arteries pick up/detect the increased carbon dioxide levels. ✓
- This message is sent to the medulla oblongata. ✓
- (Sympathetic) nerves from the medulla carry the message to the pace maker / SA node of the heart. ✓
- causing it to beat faster. ✓ (4)

[40]

TOTAL SECTION B: 80

SECTION C

QUESTION 4

Fossil formation

- Dead organisms settle to the bottom of lakes, sea and swamps (body of water). ✓
- Mineral salts in the water also settle to the bottom. ✓
- Soft body parts decay ✓ leaving only bones.
- Mineral salts filter into the bones of organism. ✓
- Turning it into stone ✓ / this is called petrification.
- Layers of sediment are deposited on top over the years. ✓
- As the layers pile up, their weight presses down on the older ones which turn into rock. ✓
- Alternatively the bones may completely decay leaving a cast of the organism. ✓
- The void left behind may then fill with minerals making a stone replica of the organism. ✓ **Max. 5**

Other types of fossils

- Fossils found in ice ✓ e.g. mammoth
- Fossils found in tar ✓e.g. sabre-toothed tiger } unaltered fossils ✓
- Fossils trapped in amber/resin ✓e.g. insects
- Carbonised fossils ✓ e.g. coal **Max. 2**

Dating fossils

Radiometric dating ✓

- Attempts to find out how long ago a particular fossil was formed ✓ / gives the real age of the fossil.
- Scientists observe the breakdown of radioactive substances in the rock ✓ / breakdown of radioactive carbon-14/uranium/potassium etc.
- They compare the amount of radioactive substance remaining ✓ to the substance it has broken down into / carbon-14 to nitrogen-14/ uranium to lead / potassium to argon. **Max. 3**

Relative dating ✓

- The age of the fossil is worked out by comparing to the age of another fossil or geological event. ✓
- It can only tell us whether a particular fossil was formed before or after a particular fossil or event ✓
- Fossils found in lower layers were formed before/are older than fossils found in an upper layer. ✓ **Max. 3**

Advantages of fossil tourism

- Creates employment / job opportunities for the local community ✓ e.g. field workers for digs, tour guides, sculptures and artists
- Creates business opportunities ✓ e.g. selling curios.
- Education of locals and visitors about our geological history. ✓
- Improves the economy of the country ✓ as foreign tourists bring more cash.
- Money gained through fossil tourism can be used to carry out further excavation. ✓
- Fossil sites will be protected as they are a source of income. ✓

Max. 4
Content: (17)
Synthesis: (3)
[20]

ASSESSING THE PRESENTATION OF THE ESSAY

Criterion	Relevance (R)	Logical sequence (L)	Comprehensive (C)
Generally	All information provided is relevant to the topic.	Ideas are arranged in a logical/cause-effect sequence.	All aspects required by the essay have been sufficiently addressed.
In this essay	Only information relevant to the description of fossil formation, dating of fossils and advantages only of fossil tourism are given.	Information regarding description of fossil formation, dating of fossils and fossil tourism is given in a logical sequential manner.	All aspects (fossil formation / other forms of fossils / dating and fossil tourism) attempted and at least **4/5** correct points on fossil formation, **4/6** correct points on dating of fossils and **3/4** correct for fossil tourism.
Mark	1 mark	1 mark	1 mark

TOTAL SECTION C: 20
GRAND TOTAL: 150