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Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2023

LIFE SCIENCES P1
MARKING GUIDELINE

MARKS: 150

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This marking guideline consists of 10 pages.

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PRINCIPLES RELATED TO MARKING LIFE SCIENCES

1. **If more information than marks allocated is given**
   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 a part of it is required**
   Read all and credit the relevant part.

4. **If comparisons are asked for, but descriptions are given**
   Accept if the 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 the 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 the answer, 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 national memo discussion meeting.

14. **If only the letter is asked for, but only the name is given (and vice versa)**
    Do not credit.

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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.

18. **Code-switching of official languages (terms and concepts)**
A single word or two that appear(s) in any official language other than the learner's 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.

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SECTION A

QUESTION 1

1.1	1.1.1	B ✓✓		
	1.1.2	C ✓✓		
	1.1.3	C ✓✓		
	1.1.4	B ✓✓		
	1.1.5	B ✓✓		
	1.1.6	A ✓✓		
	1.1.7	B ✓✓		
	1.1.8	A ✓✓		
	1.1.9	B ✓✓		
	1.1.10	B ✓✓	(10 x 2)	(20)
1.2	1.2.1	Squamous epithelium ✓		
	1.2.2	Pleural membrane ✓/ Pleura		
	1.2.3	Medulla oblongata ✓		
	1.2.4	Glucagon ✓		
	1.2.5	Egestion ✓/ Defaecation		
	1.2.6	Amino acid ✓		
	1.2.7	Villi ✓		
	1.2.8	Greenhouse ✓		
	1.2.9	Renal capsule ✓	(9 x 1)	(9)
1.3	1.3.1	A only ✓✓		
	1.3.2	Both A and B ✓✓		
	1.3.3	None ✓✓	(3 x 2)	(6)
1.4	1.4.1	(a) Aorta ✓		(1)
		(b) Inferior vena cava ✓		(1)
	1.4.2	(a) Renal artery ✓		(1)
		(b) Ureter ✓		(1)
		(c) Urinary bladder ✓		(1)
	1.4.3	- Excretion ✓ (of metabolic wastes) - Regulation of salt content of body ✓ - Regulation of blood pH ✓ - Regulation of water content of the body ✓/osmoregulation	(Any 3 x 1)	(3)
	1.4.4	Blood vessel **A** / aorta ✓		(1)

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1.5	1.5.1	(a)	Chloroplast ✓	(1)
		(b)	Photosynthesis ✓	(1)
	1.5.2		A ✓– granum ✓	(2)
	1.5.3		- Part **A** (granum) contains chlorophyll ✓ - Chlorophyll absorbs light energy ✓	(2)

TOTAL SECTION A: 50

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SECTION B

QUESTION 2

2.1 2.1.1 (a) Gall bladder ✓ (1)

(b) Pyloric sphincter ✓/pylorus (1)

2.1.2
- Secretes bile ✓
- Converts glucose to glycogen ✓
- Converts excess glucose to fat ✓
- Stores minerals such as iron ✓
- Stores vitamin A, D and B_{12} ✓
- De-amination of excess amino acids ✓
- Detoxifies certain harmful substances and make them harmless ✓

(Mark first THREE only) (Any 3 x 1) (3)

2.1.3
- The mucus glands on the mucosa layer secretes thick mucus ✓
- that acts as a barrier between the acid and the wall of the stomach ✓ (2)

2.1.4
- Bile will not emulsify fat ✓
- therefore, (pancreatic) lipase will not be able to digest fat ✓
- Bile will not neutralise the acid chyme from the stomach ✓
- therefore, enzymes secreted by the pancreas ✓ and
- the intestinal glands ✓
- will not digest proteins and carbohydrates ✓ (Any 5 x 1) (5)

2.1.5
- Part **E** acts as an exocrine gland because it has a duct ✓
- to transport its secretion ✓ to the site of action
- It also acts as an endocrine gland because it secretes hormones ✓
- that are released directly into the blood ✓/ blood transports
- hormones to the target organ. (4)

2.2 2.2.1 (a) Part **A** – Malpighian corpuscle ✓/body (1)

(b) Part **B** – Proximal convoluted tubule ✓ (1)

2.2.2 (a) Ultra-filtration ✓ (1)

(b) Tubular re-absorption ✓ (1)

2.2.3
- Blood vessel **D** is wider than blood vessel **F** ✓
- the small diameter of blood vessel **F** resists the flow of blood ✓
- and causes high blood pressure at Part **E** ✓ that
- leads to the leakage of blood plasma into part **C** ✓ (4)

2.2.4 Blood cells ✓ and (large) protein molecules ✓ (2)

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2.2.5 The inner walls of region **B** consists of:
- large number of mitochondria ✓ to generate energy for active transport of nutrients into the blood capillaries ✓
- large number of micro-villi ✓
to increase the area of absorption. ✓ (4)

2.3 2.3.1 (a) Palate ✓ (1)

(b) Peristalsis ✓ (1)

(c) Circular ✓ and longitudinal ✓ muscles (2)

2.3.2
- During swallowing, the bolus is pushed backwards into the pharynx ✓ and
- this stimulates the closure of the glottis by epiglottis blocking the flow of food into part D ✓ (2)

2.3.3
- The incomplete portion of the C-shaped cartilages of the trachea is in contact with the oesophagus ✓
- This allows the oesophagus to stretch and bulge into the trachea preventing the oesophagus from becoming blocked ✓/ prevents choking. (2)

2.3.4
- The bacterial infection causes inflammation of vocal cords ✓
- therefore, vocal cords will not be able to vibrate freely ✓ and
- no sound can be produced ✓ (Any 2 x 1) (2)

2.3.5
- Oxygen will not reach the lungs ✓
- Oxygen concentration drops in the blood ✓
- Oxygen will not be made available for cellular respiration ✓
- The energy production stops ✓
- therefore, all vital organs will stop functioning ✓

OR

- CO_2 will not be removed /exhaled from the lungs ✓
- CO_2 concentration in the blood remains high ✓
- Blood pH drops/ blood becomes very acidic ✓
- Enzymes becomes functionless ✓
- therefore, all vital metabolic processes will stop ✓ (Any 4 x 1) (4)

2.4
- The salt level in the blood increases ✓
- Receptor cells in the afferent and efferent arterioles of the kidney detect the high salt level ✓
- The adrenal gland is stimulated ✓
- to stop secreting aldosterone ✓/ to secrete less aldosterone
- This decreases the re-absorption of sodium ions from the renal tubules ✓ in the kidney
- into the surrounding blood vessels ✓
- The salt level in the blood vessels decreases ✓
- and returns to normal ✓ (Any 6 x 1) (6)

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QUESTION 3

3.1 3.1.1 Carbon dioxide ✓ (1)

3.1.2
- Bicarbonate ions ✓
- In solution in the blood plasma ✓
- Carbaminohemoglobin ✓

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

3.1.3 Pulmonary vein ✓ (1)

3.1.4 The direction of arrow indicates the outward flow of blood ✓ (1)

3.1.5
- The red blood cells/ erythrocytes contain haemoglobin ✓ for the transportation of oxygen to the tissues and carbon dioxide from the tissues. ✓
- Red blood cells/erythrocytes are biconcave discs ✓ to increase the surface area for the maximum absorption of oxygen ✓

(Mark first TWO only) (2 x 2) (4)

3.1.6
- The heater warms the air and removes the moisture from the air ✓/ humidity in the room
- The person sleeping in the room will continuously inhale dry air ✓
- causing the lungs (the moist lining of alveoli) to become dry ✓ and
- this prevents diffusion of gases between the atmospheric air and the blood in the alveolar capillaries ✓
- the low concentration of oxygen / high concentration of carbon dioxide in the blood stops metabolic processes in the cell/tissues causing possible death ✓

(Any 3 x 1) (3)

3.2 3.2.1 (a) Rate of photosynthesis ✓ (1)

(b) Concentration of carbon dioxide ✓ (1)

3.2.2 By counting the number of bubbles in unit time ✓ (in one minute) (1)

3.2.3
- Water temperature ✓
- Plant species ✓
- Person counting the bubbles ✓
- Age of plants ✓
- Light intensity ✓
- Number of leaves ✓
- Length of light exposure ✓
- Quality of baking powder ✓

(**Mark first THREE only**) (Any 3 x 1) (3)

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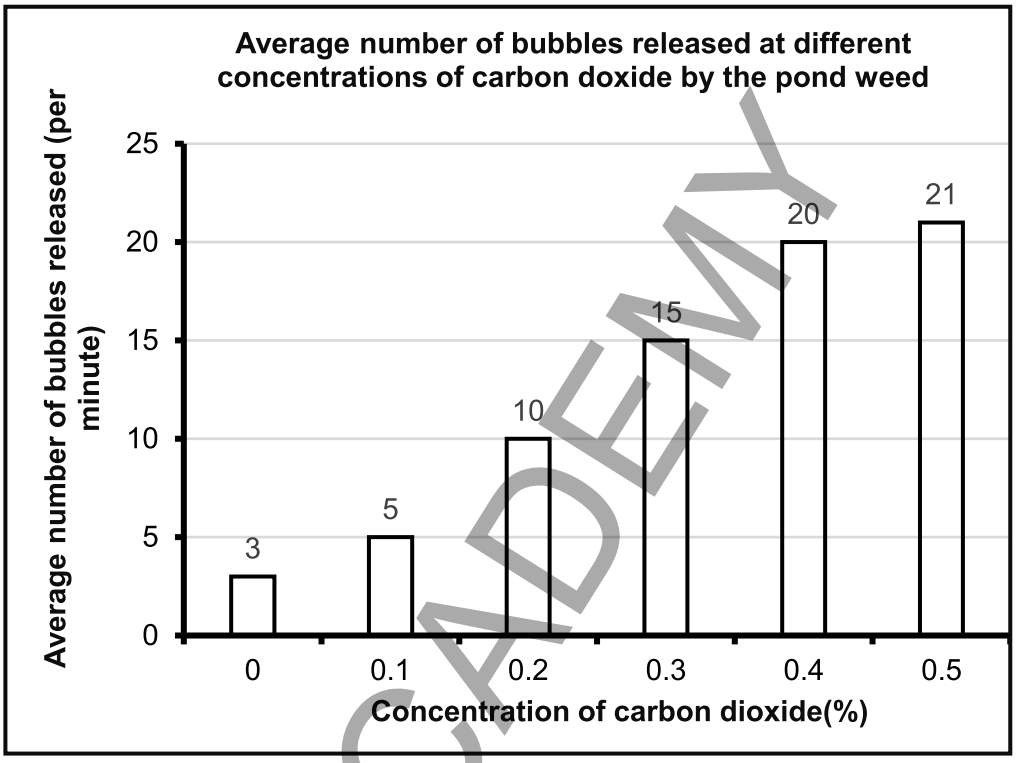
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3.2.4 - The student repeated the investigation three times at each concentration ✓ (1)

3.2.5 - To act as a baseline ✓
- to see if the concentration of CO_2 causes the change in rate of photosynthesis ✓ (2)

3.2.6



Criteria for marking graph:

Criteria	Mark allocation
Bar graph is drawn **(T)**	1
Caption of the graph includes both variables **(C)**	1
Correct labels on x-axis and y-axis **(L)**	1
Correct scale for y-axis Equal spaces between bars and equal width of bars for x-axis **(S)**	1
Plotting: **(P)** 1 – 5 co-ordinates are plotted correctly All 6 co-ordinates are plotted correctly	1 2

Histogram or **line graph** drawn:
- Lose marks for type of graph and for scale

Transposed axes:
- Can get full credit if axes labels are also swapped and bars are horizontal
- if labels are not corresponding, then lose marks for labels and scale
- Check that the plotting is correct for the given labels (6)

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3.2.7 As concentration of carbon dioxide increases the rate of photosynthesis increases ✓✓ (2)

3.3 3.3.1 (a) 20 ✓ Brix (1)

(b) 7% ✓v/v (1)

3.3.2 Carbon dioxide ✓ (1)

3.3.3
- During fermentation process, the lactic acid bacteria creates an acid medium ✓ (produce lactic acid while breaking down sugar)
- favourable for the multiplication/ breeding of yeast cells ✓
- The yeast produces vitamins and increase other nutritional components such as amino acids ✓
- for the growth of lactic acid bacteria ✓ (4 x 1) (4)

3.3.4 $17 - 7 = 10$ ✓

$\frac{10}{17} \times 100$ ✓ $= 58,82$ ✓% (3)

3.3.5 The completion of fermentation is indicated by the levelling of the sugar concentration ✓ (Brix level) (1)

3.3.6
- The micro-organisms/lactic acid bacteria and yeast derive energy ✓
- from the decomposition of sugar ✓ in the banana juice and sorghum mix
- As fermentation progresses, more sugar will be broken down ✓ and this will lead to the decrease in the sugar content (3)

3.4
- Glucose levels in the blood increase above the normal levels ✓
- the pancreas is stimulated ✓
- to secrete insulin into the blood
- insulin travels in the blood to the liver ✓
- where it stimulates the conversion of excess glucose to glycogen ✓
- which is then stored ✓
- the glucose level in the blood now decreases ✓
- and returns to normal ✓ (Any 7 x 1) (7)

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TOTAL SECTION B: 100
GRAND TOTAL: 150

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