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Province of the
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**NATIONAL
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GRADE 11

NOVEMBER 2017

**LIFE SCIENCES P1
MARKING GUIDELINE**

MARKS: 150

This marking guideline consists of 10 pages.

SECTION A**QUESTION 1**

1.1 1.1.1 A ✓✓

1.1.2 C ✓✓

1.1.3 A ✓✓

1.1.4 D ✓✓

1.1.5 D ✓✓

1.1.6 A ✓✓

1.1.7 C ✓✓

1.1.8 B ✓✓

1.1.9 B ✓✓

1.1.10 C ✓✓

(10 x 2) (20)

1.2 1.2.1 Chlorophyll ✓

1.2.2 Photolysis ✓

1.2.3 Stroma ✓

1.2.4 Villi ✓

1.2.5 Assimilation ✓

1.2.6 Kwashiorkor ✓

1.2.7 Extinction ✓

1.2.8 Pioneer ✓

(8 x 1) (8)

1.3 1.3.1 A only ✓✓

1.3.2 B only ✓✓

1.3.3 Both A and B ✓✓

(3 x 2) (6)

- 1.4 1.4.1 Logistic ✓ / S-shaped (1)
- 1.4.2 A – Lag phase ✓/Establishment phase (1)
- B – Exponential ✓/Geometric phase (1)
- C – Decelerating growth phase ✓ (1)
- D – Equilibrium phase ✓/ Stationary phase/Equilibrium (1)
- 1.4.3 (a) D ✓ (1)
- (b) B ✓ (1)
- (c) B ✓ (1)
- (d) C ✓ (1)
- 1.5 1.5.1 Developing population ✓ (1)
- 1.5.2 Female ✓ (1)
- 1.6 1.6.1 To destarch ✓ the plant (1)
- 1.6.2 (a) Leaf A ✓ (1)
- (b) Leaf B ✓ (1)
- 1.6.3 Absorbs CO₂ ✓ (1)
- 1.6.4 (Diluted) Iodine solution ✓ (1)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 Blue ✓ (1)

2.1.2 (a) Colour of light ✓ (1)

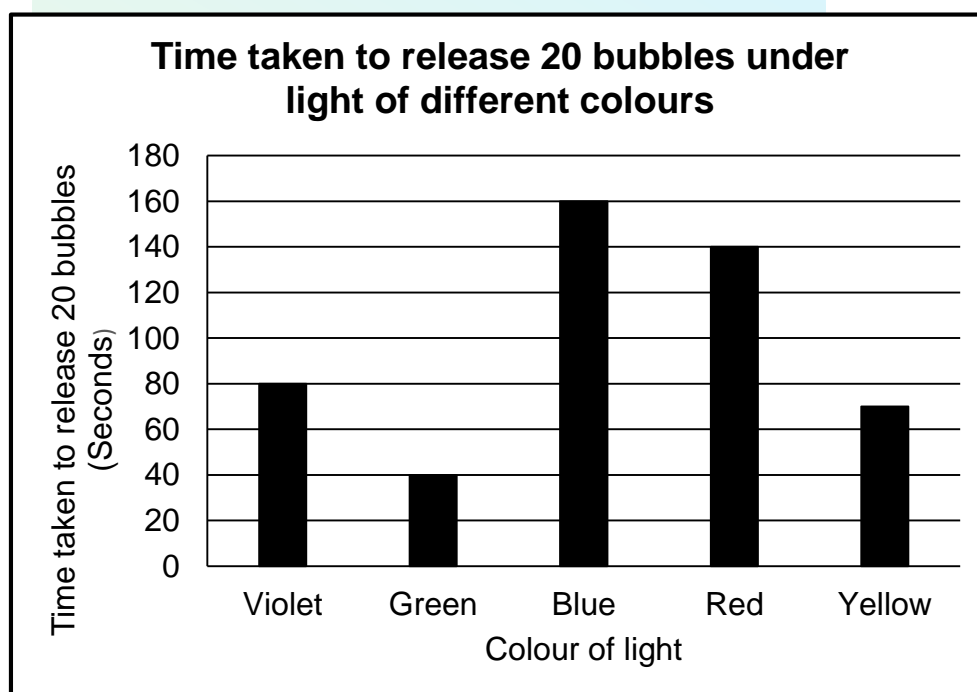
(b) Rate of photosynthesis ✓ (Time taken to release 20 bubbles) (1)

(c) the light intensity ✓/ the pondweed ✓/ the time exposed (2)

$$2.1.3 \quad \frac{80+40+160+140+70}{5} \checkmark \text{ OR } \frac{490}{5}$$

= 98 ✓ seconds (2)

2.1.4



Mark allocation for the graph

| | |
|---|---|
| Bar graph drawn (T) | 1 |
| Title of graph (both variables included) | 1 |
| Correct scale for X-axis (equal width and spacing of the bars) and Y-axis (S) | 1 |
| Correct label and unit for X-axis and Y-axis (L) | 1 |
| Plotting of bars (P) | 0: No bars plotted correctly 1: 1 to 4 bars plotted correctly 2: all 5 bars plotted correctly |

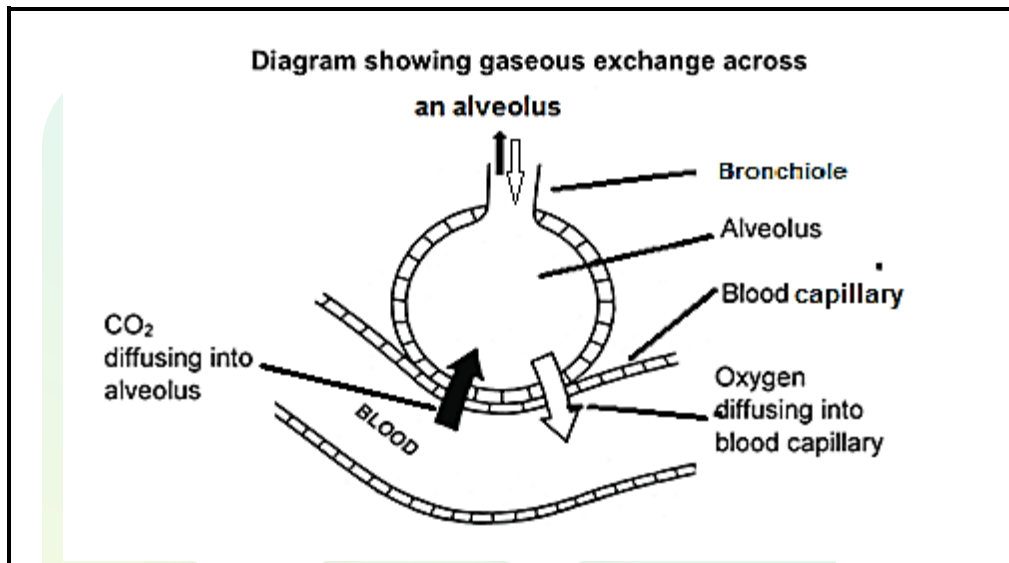
NOTE: If a line graph is drawn – marks will be lost for the ‘type and scale’.

If a histogram is drawn – marks will be lost for ‘type of graph and correct scale’.

(6)

- 2.2 2.2.1 A – larynx ✓
B – trachea ✓
C – bronchioles ✓ (3)
- 2.2.2 Process 1 ✓ (1)
- 2.2.3 Ribs are lifted/ chest cavity expands/ moves outwards. ✓
Thoracic cavity enlarges / lungs are larger. ✓
Diaphragm contracts / flattens/ moves downwards. ✓
(Mark first TWO only.) (Any 2 x 1) (2)
- 2.2.4 D ✓ – intercostal muscle ✓
E ✓ – diaphragm ✓ (4)

2.2.5



Marks:

- | | | |
|---------------------------------------|---|-----|
| Diagram | 1 | |
| Oxygen diffusion into blood | 1 | |
| Carbon dioxide diffusion out of blood | 1 | |
| Any other 2 labels | 2 | (5) |

- 2.2.6 - Increases the amount of moisture in the air ✓
- because water evaporates ✓
- prevents drying out of inner surface of lung ✓
- which would prevent gaseous exchange ✓/ gases can only diffuse in a solution. (4)
- 2.2.7 - Cannot breathe /inhale/exhale/lungs collapse. ✓
- No pressure difference between exterior and thoracic cavity. ✓ (2)

- 2.3 2.3.1 Malpighian body ✓ (1)
- 2.3.2 A – Afferent arteriole ✓
 B – Efferent arteriole ✓ (2)
- 2.3.3 The diameter of both **A** and **B** is the same. ✓
 Therefore, no high blood pressure created at the glomerulus. ✓
 Hence no filtration of plasma into the capsular space occurs / no
 ultra-filtration ✓/ filtration (3)
- [40]



QUESTION 3

- 3.1 3.1.1 (a) D ✓ – Contains proteins/highest flow rate ✓ (2)
- (b) B ✓ – High concentration of glucose, but no proteins ✓ (2)
- (c) C ✓ – No glucose and lower concentration of sodium / the urea is higher in concentration than in D ✓ (2)
- (d) A ✓ – Has the highest concentration of urea ✓ (2)
- 3.2 3.2.1 Mark and recapture ✓ / Petersen method (1)
- 3.2.2 Indirect ✓ (1)
- 3.2.3 Snails live in the garden where plants are watered regularly ✓/rain and the mark will wash off if it is not water resistant. ✓ (2)
- 3.2.4 So that snails get only enough time to mix with the rest, but not breed ✓✓ or perhaps so long that some may die in between. ✓✓ (2)
- 3.2.5 $P = \frac{F \times S}{M}$ ✓ $\rightarrow F = \frac{P \times M}{S}$ ✓ $\rightarrow F = \frac{60 \times 5}{15}$ ✓
= 20 snails in the first sample ✓ (4)
- 3.2.6 Increase the sample size ✓
Repeat as many times possible and get the average ✓ (2)
- 3.3 (a) The maximum number of individuals ✓ that can be supported by the environment ✓ under the conditions prevailing at any given time. (2)
- (b) The changes in a community over time ✓ which involves species in one stage being replaced by different species. ✓ (2)
- 3.4 3.4.1 Absorbs carbon dioxide ✓ from the air entering the apparatus. (1)
- 3.4.2 To prevent photosynthesis ✓ (1)
- 3.4.3 To ensure that only gas is transferred to B ✓ and prevents transfer and mixing of sodium hydroxide with lime water in B. ✓ (2)
- 3.4.4 B – Lime water will still be clear ✓ because the incoming air was free of carbon dioxide ✓ because it was absorbed by soda lime and sodium hydroxide solution. ✓
D – Lime water turns milky ✓ because the plant respired and released carbon dioxide. ✓ (5)

- 3.5 3.5.1 Cheese, yoghurt, wine, beer, whisky, brandy. (Any other relevant products) (Any 1 x 1) (1)
(Mark the first ONE only.)
- 3.5.2 - Products are exported ✓ and earns foreign exchange ✓
 - Jobs are created ✓ and reduces unemployment ✓ / more people have a source of income.
 - Company profit increases ✓ and government earns more revenue as taxes. ✓
(Mark the first TWO only.) (Any 2 x 2) (4)
- 3.5.3 Derives energy ✓ for cellular activities. ✓ (2)
[40]

TOTAL SECTION B: 80



SECTION C**QUESTION 4****Digestion**

- Carbohydrates are broken down to smaller size by teeth ✓
- and the stomach churns/ mixes the food ✓ to become a liquid
- which is known as chyme. ✓
- Carbohydrases/ amylase ✓
- in the saliva, ✓
- in the pancreatic juice ✓
- and intestinal juice ✓ break down the
- polysaccharides (starch) ✓
- to disaccharides ✓ and
- eventually to monosaccharides (or examples) ✓
- in an alkaline ✓ medium

Max. 9

Absorption

- Glucose ✓ in small intestine ✓ moves
- and by active transport ✓ which requires energy ✓
- and by diffusion ✓ passive/ no energy required ✓
- through the columnar epithelial cells ✓
- into the blood capillaries ✓
- of the villus. ✓

Max. 4

Transportation

- The blood capillaries in the villi join together ✓
- and eventually form the hepatic portal vein ✓
- This blood vessel carries the product to the liver ✓
- Processed nutrients, ✓ leave the liver in the hepatic veins ✓
- The hepatic veins join up with the inferior vena cava ✓
- that takes the blood to the heart ✓
- The heart then will pump the nutrient-rich blood to the whole body/cells/tissues ✓
- via the aorta ✓

Max. 4

ASSESSING THE PRESENTATION OF THE ESSAY

| Criterion | Relevance(R) | Logical sequence(L) | Comprehensive(C) |
|----------------------|--|--|---|
| Generally | All information provided is relevant to the question. | Facts are arranged in a logical/ sequential order. | All aspects required by the essay have been sufficiently addressed. |
| In this essay | Only information relevant to the process of carbohydrate digestion / absorption and transportation is discussed. (No irrelevant information) | Events leading from digestion up to the final transportation of carbohydrates are discussed in the correct sequence. | Learner has scored at least: - Digestion (5) - Absorption (3) - Transportation (3) |
| MARK | 1 | 1 | 1 |

Synthesis (3)**TOTAL SECTION C: 20****GRAND TOTAL: 150**