This memorandum consists of 10 pages.
PRINCIPLES RELATED TO MARKING LIFE SCIENCES 2013

1. **If more information is given than marks allocated**
   Stop marking when maximum marks are reached, draw a wavy line and write '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 a whole process is given when only part of it is required**
   Read all and credit relevant parts.

4. **If comparisons are required 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 descriptions are required but diagrams with annotations are given**
   Candidates will lose marks.

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

8. **If the sequence is muddled and links do not make sense**
   Where the sequence and links are correct, credit. Where the sequence and links are incorrect, do not credit. If sequence and links becomes 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, 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 if correct according to curriculum

14. **If only a letter is required and only a name is given (and vice versa)**
    No credit.
15. **If units are not given in measurements**  
Memorandum will allocate marks for units separately, except where it is already given in the question.

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

17. **Caption**  
Credit will be given for captions of all illustrations (diagrams, graphs, tables, etc.) except where it is already given in the question.

18. **Code-switching/mixing of official languages (terms and concepts)**  
A single word or two that appears in his/her answers in any official language other than the learners’ assessment language should be credited, if it is correct. A marker that is proficient in the relevant official language should be consulted. This applies to all official languages.
QUESTION 1

1.1  1.1.1 D ✓ ✓
     1.1.2 A ✓ ✓
     1.1.3 B ✓ ✓
     1.1.4 D ✓ ✓
     1.1.5 A ✓ ✓
     1.1.6 C ✓ ✓
     1.1.7 A ✓ ✓
     1.1.8 C ✓ ✓
     1.1.9 A ✓ ✓
     1.1.10 B ✓ ✓  
       (10 x 2)  (20)

1.2  1.2.1 Culling ✓
     1.2.2 Pleura ✓
     1.2.3 Photosynthesis ✓
     1.2.4 Natality ✓
     1.2.5 Dialysis ✓
     1.2.6 Emphysema ✓  
       (6 x 1)  (6)

1.3  1.3.1 Both A and B ✓ ✓
     1.3.2 A only ✓ ✓
     1.3.3 B only ✓ ✓
     1.3.4 Both A and B ✓ ✓
     1.3.5 A only ✓ ✓
     1.3.6 Both A and B ✓ ✓  
       (6 x 2)  (12)

1.4  1.4.1 G ✓
     1.4.2 H ✓
     1.4.3 E ✓
     1.4.4 A ✓
     1.4.5 A ✓  
       (5 x 1)  (5)

1.5  1.5.1 B ✓
     1.5.2 B ✓
     1.5.3 E ✓
     1.5.4 C ✓
     1.5.5 D ✓
     1.5.6 A ✓
     1.5.7 F ✓  
       (7 x 1)  (7)

TOTAL SECTION A:  50
## SECTION B

### QUESTION 2

2.1 2.1.1 A - Oesophagus ✓
     C - Pancreas ✓
     E - Rectum ✓
     H - Liver ✓  

2.1.2 (a) G ✓
     (b) B ✓
     (c) F ✓

(1)

2.2 2.2.1 Blue ✓

2.2.2 (a) Colour of light ✓
     (b) Time taken to release 20 bubbles ✓

(1)

2.2.3 \[
\frac{80 + 40 + 160 + 140 + 70}{5} = 98 \text{ seconds ✓}
\]

2.2.4 2:1:4 ✓

(2)

2.2.5 Allows the plant to adjust ✓ its rate of photosynthesis to the new conditions.

(2)

2.2.6 Repeat ✓ the experiment/Take more readings for light of each colour.

(1)

2.2.7 Green light poorly absorbed ✓ compared to other colours.

OR

More green light ✓ will be reflected ✓ by the leaves.

(2)
2.2.8

Mark allocation for the graph

<table>
<thead>
<tr>
<th>Mark allocation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct type of graph</td>
<td>1</td>
</tr>
<tr>
<td>Title of graph</td>
<td>1</td>
</tr>
<tr>
<td>Correct label for X-axis</td>
<td>1</td>
</tr>
<tr>
<td>Correct label for Y-axis including correct unit</td>
<td>1</td>
</tr>
<tr>
<td>Appropriate width and interval of bars</td>
<td>1</td>
</tr>
<tr>
<td>Appropriate scale for Y-axis</td>
<td>1</td>
</tr>
<tr>
<td>Drawing of bars</td>
<td>1: Drew 1 to 4 bars correctly</td>
</tr>
<tr>
<td></td>
<td>2: Drew all 5 bars correctly</td>
</tr>
</tbody>
</table>

**NOTE:** If the wrong type of graph is drawn, marks will be lost for 'correct type of graph' and for 'drawing of bars'.

(8) (21)
2.3 Mark allocation for diagram:

| Caption | 1 |
| Shape: (oval/elliptical) | 1 |
| Labels: Any 3 | 3 |

(Section of) a chloroplast

2.4 AEROBIC RESPIRATION | ANAEROBIC RESPIRATION

| Requires oxygen | Independent of oxygen |
| Takes place in the cytosol and mitochondria | Takes place in the cytosol only |
| By-products are carbon dioxide and water | By-products are carbon dioxide and ethanol in plants and lactic acid in animals |
| Releases large amounts of energy | Little energy released |

(Any 3 x 2 + 1 for table)
QUESTION 3

3.1 3.1.1 Kidney ✓ (1)

3.1.2 A: Renal cortex ✓
     B: Renal pyramid ✓
     D: Renal pelvis ✓ (3)

3.1.3 (a) Protects the kidney ✓ (1)
     (b) Transports urine to the bladder ✓ (1)

3.1.4 - Excretion ✓
     - Osmoregulation ✓
     - pH regulation ✓
     - Mineral salt regulation (Any 3) (3)

3.2 3.2.1 In the cortex ✓ (1)

3.2.2 Diffusion/Glomerular/Ultra-/Pressure filtration ✓ (1)

3.2.3 Glomerulus/Blood capillary ✓ (1)

3.2.4 - Walls are made of a single/thin layer ✓ to facilitate diffusion ✓ of substances.
     - Many tiny pores ✓ act as microfilters, restricting large substances such as proteins/blood corpuscles. ✓
     - Lots of capillaries ✓ to ensure large surface area. ✓ (Any 2 x 2) (4)
     (Mark only the first two)

3.2.5 To create a high pressure ✓ in C for filtration. ✓ (2)

3.2.6 ADH ✓ (1)

3.2.7 - Makes collecting duct ✓ /distal convoluted tubule
     - more permeable to water ✓
     - allowing more water to be reabsorbed. ✓ (3)

(13)
3.3

3.3.1  A✓

3.3.2  Growth slowed down and became constant✓ since the population reached carrying capacity✓ due to environmental resistance✓/available resources.  (3)

3.3.3  Starts slowly and then increases rapidly✓.  (1)

3.3.4  Human population has not reached the carrying capacity✓ yet due to attempts to increase availability of resources such as food✓ using advancements in agricultural technology ✓ and the production of GMO's using biotechnology✓.  (4)

3.3.5  Regulation of population growth by proper family planning✓ Allocation of subsidies to people that have small families✓.  (2)

3.4

3.4.1  8✓%  (1)
3.4.2  15-19✓ years  (1)
3.4.3  3✓%  (1)
3.4.4  Females✓  (1)
3.4.5  Pyramid B✓  (1)
3.4.6  Low birth rate✓  (2)
Low death rate/Higher life expectancy✓  (7)

TOTAL SECTION B: 80
SECTION C

QUESTION 4

Mechanical breakdown
Carbohydrates broken down to a smaller size ✓
by the teeth ✓
and stomach ✓ which grinds the food
to become a liquid called chyme. ✓ max (3)

Chemical Digestion
Carbohydrases ✓ in the
saliva ✓, pancreatic juice ✓ and intestinal juice ✓
break down the polysaccharides ✓ to disaccharides ✓
and eventually to monosaccharides ✓
in an alkaline medium. ✓ max (6)

Absorption
Glucose/Monosaccharide moves by diffusion ✓
through the columnar epithelial cells ✓
into the blood capillaries ✓
of a villus ✓
The capillaries all join to form the hepatic portal system. ✓ max (4)

Assimilation
Takes the digested food to the liver ✓ and muscles ✓
where it can be stored ✓ as glycogen ✓
and from there to the rest of the body through the hepatic vein ✓
to the cells ✓
to produce energy through cellular respiration ✓
or to synthesise other polysaccharides for growth ✓/repair. ✓ max (4) (17)

ASSESSING THE PRESENTATION OF THE ESSAY

<table>
<thead>
<tr>
<th>Marks</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Well structured – demonstrates insight and understanding of the question</td>
</tr>
<tr>
<td>2</td>
<td>Minor gaps in the logic and flow of the answer</td>
</tr>
<tr>
<td>1</td>
<td>Attempted but with significant gaps in the logic and flow of the answer</td>
</tr>
<tr>
<td>0</td>
<td>Not attempted/nothing written other than question number/no relevant information</td>
</tr>
</tbody>
</table>

TOTAL SECTION C: 20
GRAND TOTAL: 150