This memorandum consists of 9 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.
**SECTION A**

**QUESTION 1**

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

1.2  1.2.1 Alien✓/Exotic species
     1.2.2 Biodiversity✓
     1.2.3 Fungus✓/Yeast
     1.2.4 Invertebrates✓
     1.2.5 Sustainable✓/Sustainability
     1.2.6 Asexual✓ reproduction
     1.2.7 Carbon footprint✓
     1.2.8 Desertification✓
     1.2.9 Double✓ fertilisation
     1.2.10 Sorus✓  \((10)\)

1.3  1.3.1 B only✓✓
     1.3.2 A only✓✓
     1.3.3 Both A and B✓✓
     1.3.4 None✓✓
     1.3.5 B only✓✓
     1.3.6 Both A and B✓✓
     1.3.7 Both A and B✓✓
     1.3.8 Both A and B✓✓
     1.3.9 B only✓✓
     1.3.10 B only✓✓  \((10 \times 2)\)  \((20)\)

**TOTAL SECTION A:** 50
SECTION B

QUESTION 2

2.1 2.1.1 Multicellular✓

2.1.2
(a) B✓
(b) B✓
(c) C✓
(d) B✓
(e) C✓
(f) D✓
(g) A✓

2.1.3 It separates the gut from the body wall✓
Allowing for more extensive growth of organs and systems✓

2.1.4 Annelida✓
Arthropod✓

2.1.5 Coelom in Arthropods is reduced and contain haemocoels✓
Coelom in Annelids contain coelomic fluid✓

2.1.6 They are pollinators✓
Used in biological control of pests✓
Important for seed dispersal✓

2.2 2.2.1 D – Anther✓
E – Stigma✓
F – Petal ✓/Corolla

2.2.2 B✓

2.2.3 Filaments and stigma are enclosed✓
Has a large corolla/petals ✓

2.2.4 B✓

2.2.5 A: angiosperm✓
Pine cone: gymnosperm✓

2.2.6 Gymnosperm's seeds are naked✓
Angiosperm's seeds are enclosed in an ovary/fruit✓

2.2.7 After pollination a pollen tube✓ is developed – allows male gamete to be carried directly to the egg cell ✓ in the ovule
2.2.8 Seeds have a tougher coat ✓ which prevents drying out
Seeds have food reserves ✓ for the developing embryo
Seeds have a fully developed embryo ✓ to immediately start
growing when conditions become favourable
Seeds have a longer lifespan ✓ than spores
Seeds can remain dormant (and still viable) ✓ longer than spores

(Mark first TWO only)

(Any 2) (2)

2.3 2.3.1 Protista ✓

2.3.2 Take anti-malarial drugs ✓
Use insect repellents on exposed skin ✓
Sleep under bed-nets ✓
Empty areas of standing water to prevent breeding of mosquitoes ✓

(Any 2) (2)

2.3.3 A female Anopheles mosquito ✓ bites an infected person; the
parasite is sucked in ✓ and develops further in the vector and the
mosquito bites another person ✓ transferring the parasite. (Any 2) (2)

2.3.4 Antibiotics can only be used to treat diseases caused by bacteria ✓
and the malaria is transmitted by a protist ✓

(2)

2.3.5 The economy will be negatively affected ✓ as the cost of malarial
treatment is high ✓/decreased work production

(2)

2.3.6 From hospital records ✓

(1)

2.3.7 Not all people affected go to hospital ✓ in some areas

(11)

[40]
QUESTION 3

3.1  3.1.1  Food wastage in Sub-Saharan Africa

3.1.2  Because food is scarce due to poverty, there is no food left over to waste. (2)

3.1.3  In developed regions, food purchased is often in excess of their requirements and people will throw unused food away. (2)

In developing regions: Many people cannot afford food and will generally not have food in excess of their needs. (4)

3.1.4  Possible ways to reduce food waste include:

- Plan what you need before you shop and reduce impulse and spontaneous buying (1)
- Understand how to store and preserve food (1)
- Ensure that unused food is used in some way, e.g. give to the poor, animal feed, compost heaps. (1)
- Education about the need to prevent wastage (Any 2) (11)

3.2  3.2.1  There has been an increase in the human population (1)

3.2.2  (a) Pesticides kill the pest which destroy the crops (1)
(b) Fertilisers increase nutrient content in the soil (1)

3.2.3  Consumers could die if they feed on pests that have been poisoned by the pesticide.

If the pests are killed off by the pesticide there will not be food available for the next level consumer. (Any 1 x 2) (2)

3.2.4  Loss of flora and fauna biodiversity by inbreeding of GMOs. Entire species could be wiped out if exposed to new disease/new environmental conditions. (3)

3.2.5  • Nitrogen-rich compounds in fertilisers
• Causes an overgrowth of algae/ algal bloom
• This leads to a decrease in the amount of light coming into the water
• As a result plants start to die
• Increasing the amount of bacteria that decomposes these plants
• This leads to a decrease in the amount of oxygen as it is used up by the bacteria
• Other aquatic organism also die due to lack of oxygen (Any 5) (13)
3.3 • Investigate methods to collect and utilise methane gas as a fuel ✓
• Encourage citizens of the city to sort their waste ✓ into different waste containers
• Partnerships with recycling companies for improved collection of different wastes ✓
• Fines ✓ for people who do not separate the waste into different bins
• Educate people to use organic waste ✓ for example to make compost
• Encourage recycling ✓ of items such as papers, tins, glass
• Encourage citizens to re-use ✓ items such as glass etc
• Charge/Penalise people extra if they generate more waste ✓

(Mark first FOUR only) (Any 4) (4)

3.4 3.4.1 Changes in the levels of chlorine and ozone concentration ✓ from 1950 to 1990 ✓ (2)

3.4.2 An increase in the level of chlorine ✓ leads to a decrease in the ozone concentration ✓ (2)

3.4.3 Chlorine levels ✓
Ozone concentration ✓ (2)

3.4.4 Between 1970 and 1980 ✓ (1)

3.4.5 CFCs might persist for a long time in the atmosphere ✓
Other countries might have taken longer to implement the protocol ✓
Households were still using the existing items with CFCs ✓

(Any 2) (2)

3.4.6 Aerosols ✓
Refrigerators ✓
Food packaging ✓ (Any 1) (1)

3.4.7 Ozone layer provides protection against ultraviolet rays ✓
thus reducing the chances of getting skin cancer ✓ (2) (12) [40]

TOTAL SECTION B: 80
SECTION C

QUESTION 4

Urbanisation✓ – land is cleared for housing, industries and roads✓ leading to habitat fragmentation which eventually lead to a decrease in genetic diversity✓ causing populations to become extinct

Poor farming methods✓ – monoculture allows only a few species of animals to survive✓, losing a large amount of plants and animals which would have been present if the crops were varied✓

Overgrazing✓ of land leads to loss of topsoil/erosion✓ decreasing spoil fertility✓

Use of pesticides✓ which kills secondary consumers ✓ and fertilisers which when washed to rivers disturbs the ecosystem✓ of the river leading to extinction of some populations

Golf estates✓ require plenty of water and vast clearance of vegetation to make way for the lawn✓, in which only a few species will exist✓

Mining✓ results in degradation of ground water as well as a change in the pH of the water around the area, emission of toxic gases into the atmosphere and also causes soil erosion✓. The environment is altered in such a way that organisms can no longer exist in the area✓

Deforestation✓ – the demand for wood products cause many trees to be cleared✓, this destroys the ecosystems within the forest area✓ leading to extinction of some populations.

Destruction of wetlands and grasslands✓ – these areas have been cleared for human inhabitation ✓reducing the biodiversity of organisms surviving entirely on wetlands or grasslands✓ (Any 6)

ASSESSING THE PRESENTATION OF THE ESSAY

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<thead>
<tr>
<th>Marks</th>
<th>Description</th>
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<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</td>
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Synthesis (3)

TOTAL SECTION C: 20
GRAND TOTAL: 150

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