These marking guidelines consist 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 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.
15. **If units are not given in measurements**
   Candidates will lose marks. Marking guidelines 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.

19. **Changes to the marking guidelines**
   No changes must be made to the marking guidelines. The provincial internal moderator must be consulted, who in turn will consult with the national internal moderator (and the Umalusi moderators where necessary).

20. **Official marking guidelines**
   Only marking guidelines bearing the signatures of the national internal moderator and the Umalusi moderators and distributed by the National Department of Basic Education via the provinces must be used.
## SECTION A

### QUESTION 1

1.1  1.1.1  B  ✓ ✓  
1.1.2  C  ✓ ✓  
1.1.3  C  ✓ ✓  
1.1.4  D  ✓ ✓  
1.1.5  A  ✓ ✓  
1.1.6  D  ✓ ✓  
1.1.7  B  ✓ ✓  
1.1.8  A  ✓ ✓  
1.1.9  C  ✓ ✓  

(9 x 2)  (18)

1.2  1.2.1  Spindle fibres ✓ / spindle threads ✓  
1.2.2  Maculae ✓  
1.2.3  Anti-diuretic hormone ✓ / ADH ✓  
1.2.4  Methane ✓ / CH₄ ✓  
1.2.5  Aquifer ✓  
1.2.6  Medulla oblongata ✓  
1.2.7  Homeostasis ✓  
1.2.8  Chorion ✓  
1.2.9  Acrosome ✓  

(9)

1.3  1.3.1  B only ✓ ✓  
1.3.2  B only ✓ ✓  
1.3.3  Both A and B ✓ ✓  

(3 x 2)  (6)

1.4  1.4.1  (a) Sclera ✓  
(b) Lens ✓  
(c) Ciliary body ✓ / ciliary muscle  

(1)

1.4.2  Pupillary mechanism ✓  

(1)

1.4.3  Iris ✓  

(1)

1.4.4  Near vision will be blurred ✓ / Only distant objects will be clearly visible  

(1)  (6)
1.5 1.5.1 (a) Pituitary gland/hypophysis (1)
(b) Graafian follicle (1)
(c) Ovulation (1)
(d) Corpus luteum (1)

1.5.2 Remains low/decreases (1)

1.5.3 - Stimulates ovulation
- Stimulates the development of the corpus luteum
(Mark first ONE only) Any (1)

1.6 1.6.1 Black (Mark first ONE only) (1)

1.6.2 (a) - They constricted/vasoconstriction occurred
- Less blood flowed in the blood vessels (1)
Any
(b) - The sweat glands became less active
- Less sweat was secreted (1)
Any

1.6.3 Hypothalamus (1)

1.6.4 - The whole body will appear black/black and grey
- There will be no white areas
(Mark first ONE only) Any (1)

TOTAL SECTION A: 50
SECTION B

QUESTION 2

2.1 2.1.1 Telophase I

2.1.2

2.1.3

MARKING GUIDELINE

Only two gametes drawn (G) 1
Gamete contains 2 chromosomes (C) 1
The chromosomes are unreplicated (U) 1
Correct shading on ALL the unreplicated chromosomes (S) 1

<table>
<thead>
<tr>
<th>Prophase I</th>
<th>Prophase II</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cell is diploid /has homologous chromosomes</td>
<td>The cell is haploid /does not have homologous chromosomes</td>
</tr>
<tr>
<td>Crossing over takes place</td>
<td>No crossing over takes place</td>
</tr>
</tbody>
</table>

(Mark first TWO only) 1 + 4

Phototropism

- The same species of plant was used in each set-up
- Identical clinostats were used in each set-up
- The same period of time /5 weeks was used for each set-up
- Each apparatus was placed in a box with a single opening
- The opening on each box was in the same position /was the same size/allowed the same amount of light to enter

(Mark first TWO only) Any

- The investigation was only done once /not repeated
- Only one plant was used in each set-up /the sample size was too small

(Mark first ONE only) Any
2.2.4  (a) B ✓  (1)
(b) A ✓  (1)

2.2.5 - The auxins moved away from the light ✓ /were destroyed by the light
- so that the darker side had a high concentration of auxins ✓
- and the lighted side had a low concentration of auxins ✓  (3) (9)

2.3 2.3.1 - From the dendrite ✓
- to the axon ✓  (2)

2.3.2 0 to 1 ✓ µm / 0 to 0,9 µm  (2)

2.3.3 As the axon diameter increases the speed of the impulse increases ✓ ✓
OR
As the axon diameter decreases the speed of the impulse decreases ✓ ✓  (2)

2.3.4 - The speed of the impulse will decrease ✓
- resulting in it taking longer for impulses to reach the effectors ✓
- and the person will react more slowly ✓  (3) (9)

2.4 2.4.1 (a) F ✓ - Auditory nerve ✓  (2)
(b) G ✓ - Eustachian tube ✓  (2)

2.4.2 (a) B ✓ and C ✓
(Mark first TWO only)  (2)
(b) E ✓ and F ✓
(Mark first TWO only)  (2)

2.4.3 - Grommets ✓ will be inserted in the tympanic membrane
- Antibiotics ✓
(Mark first ONE only) Any  (1)

2.4.4 Auditory canal ✓  (1)

2.4.5 - The ear wax can be removed ✓ from the auditory canal
- to allow sound to reach the tympanic membrane ✓ /which will
allow the tympanic membrane to vibrate freely  (2) (12) [40]
QUESTION 3

3.1 3.1.1 (a) Testis
(b) Epididymis
(c) Scrotum

3.1.2 - Under the influence of testosterone
- diploid cells/germinal epithelium
- in the seminiferous tubules of the testis
- undergo meiosis
- to form (haploid) sperm

3.1.3 - The testes will be away from the body
- The temperature of the testes will therefore be lower than body temperature
- for successful sperm production

- Tight underwear will pull the testes close to the body
- The temperature of the testes will be too high/higher pressure on the testes
- and sperm will not mature/sperm production is negatively affected

3.1.4 (a) - There will be no sperm in the semen
- therefore no fertilisation can take place

(b) - The fluid part of the semen will still be produced
- by the accessory glands/seminal vesicles/prostate gland/Cowper’s glands

3.2 3.2.1 - All people
- should have enough food
- The food should be nutritious/of good quality
- and be accessible at all times

3.2.2 - Use fertilisers
- Monoculture
- Use pesticides/example
- Improved irrigation
- Crop rotation
- Artificial selection

(Mark first TWO only)

3.2.3 2 500

3.2.4 - Crops were destroyed by insects
- which led to a lower yield/added expenses for insecticides
- and resulted in lower profits

(1) (2) (3) (4) (14) (9)
3.3 3.3.1
- A ✓
- B ✓
- E ✓

(Mark first TWO only) Any (2)

3.3.2
- The scar tissue ✓
- may partially block the Fallopian tube ✓
- preventing the embryo from reaching the uterus ✓/resulting in implantation in the Fallopian tube (3)

3.3.3
- The other Fallopian tube is still present ✓/not blocked
- Fertilisation may still take place in this Fallopian tube ✓/the developing embryo can move along this Fallopian tube

OR
- During invitro fertilisation ✓ (IVF)
- the resulting embryo is inserted into the uterus ✓

OR
- The ovum can be placed after the blockage ✓
- allowing fertilisation ✓ (2)

3.3.4
- Insufficient space ✓
- Poor/no placental development ✓
- Decreased blood supply ✓
- Insufficient nutrients ✓/oxygen

(Mark first TWO only) Any (2)

3.4 3.4.1
- Biological control ✓/example
- Mechanical control ✓/example
- Chemical control ✓/example

(Mark first TWO only) Any (2)

3.4.2
- The alien plants block out sunlight ✓
- Water plants below the surface stop photosynthesising ✓/die
- and less oxygen is released into the water ✓
- Other organisms die ✓/decay
- polluting the water ✓ Any (4)

3.4.3
- The parts of the plants that photosynthesise are above the water ✓
- therefore the oxygen from photosynthesis is released into the air ✓/not into the water (2)

TOTAL SECTION B: 80
QUESTION 4

Reflex arc (A)
- The receptor receives the stimulus✓ and
- converts it into an impulse✓
- which is transmitted by the sensory neuron✓
- through the dorsal root✓
- of spinal nerve✓
- to the spinal cord✓
- where the impulse is transferred via the interneuron✓
- to the motor neuron✓
- which carries the impulse via the ventral root✓
- to the effector✓/muscle/gland
- The impulse is transferred from one neuron to the next via a synapse✓ Any (8)

Role of the endocrine system in providing energy (E)
- More adrenalin✓ is secreted
- by the adrenal glands✓
- increases blood glucose✓/increase heart rate/ increase breathing rate/dilate blood
  vessels to essential organs
- More glucagon✓ is secreted
- by the pancreas✓/islets of Langerhans
- increases blood glucose✓
- More TSH✓ is secreted
- by the pituitary gland✓
- to increase thyroxin production✓
- More thyroxin✓ is secreted
- by the thyroid gland✓
- to increase the body’s metabolic rate✓/rate of respiration Any (9)

ASSESSING THE PRESENTATION OF THE ESSAY

<table>
<thead>
<tr>
<th>Relevance</th>
<th>Logical sequence</th>
<th>Comprehensive</th>
</tr>
</thead>
<tbody>
<tr>
<td>All information provided is relevant to the question</td>
<td>Ideas arranged in a logical/ cause-effect sequence</td>
<td>Answered all aspects required by the essay in sufficient detail</td>
</tr>
</tbody>
</table>
| All the information provided is relevant to:
  - Reflex arc
  - Role of the endocrine system in providing energy | All the information regarding the:
  - Reflex arc
  - Role of the endocrine system in providing energy is arranged in a logical manner. | At least the following points should be included:
  - Reflex arc (A) (5/8)
  - Role of the endocrine system in providing energy (E) (6/9) |
| There is no irrelevant information | | |
| 1 mark | 1 mark | 1 mark |

TOTAL SECTION C: 20
GRAND TOTAL: 150

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