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**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2022

**LIFE SCIENCES P1
MARKING GUIDELINE**

MARKS: 150

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This marking guideline consists of 8 pages.

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.

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.

SECTION A

QUESTION 1

- | | | | | |
|-----|--------|---|----------|------|
| 1.1 | 1.1.1 | A ✓✓ | | |
| | 1.1.2 | A ✓✓ | | |
| | 1.1.3 | B ✓✓ | | |
| | 1.1.4 | D ✓✓ | | |
| | 1.1.5 | D ✓✓ | | |
| | 1.1.6 | C ✓✓ | | |
| | 1.1.7 | D ✓✓ | | |
| | 1.1.8 | A ✓✓ | | |
| | 1.1.9 | A ✓✓ | | |
| | 1.1.10 | C ✓✓ | (10 x 2) | (20) |
| 1.2 | 1.2.1 | Prolactin ✓ | | |
| | 1.2.2 | Mitosis ✓ | | |
| | 1.2.3 | Reflex arc ✓ | | |
| | 1.2.4 | Autonomic ✓ nervous system | | |
| | 1.2.5 | Synapse ✓ | | |
| | 1.2.6 | Cranium ✓ | | |
| | 1.2.7 | Gestation ✓ | | |
| | 1.2.8 | Thyroid stimulating hormone ✓/ TSH | | |
| | 1.2.9 | Osmoregulation ✓ | | |
| | 1.2.10 | Corpus callosum ✓ | (10 x 1) | (10) |
| 1.3 | 1.3.1 | A only ✓✓ | | |
| | 1.3.2 | None ✓✓ | | |
| | 1.3.3 | A only ✓✓ | (3 x 2) | (6) |
| 1.4 | 1.4.1 | (a) Hypothalamus ✓ | | (1) |
| | | (b) Pituitary ✓ gland | | (1) |
| | | (c) ADH ✓/ Antidiuretic hormone | | (1) |
| | | (d) Renal tubules ✓ /collecting tubule/distal convoluted tubule | | (1) |
| | 1.4.2 | Becomes more permeable to water ✓ | | (1) |
| | 1.4.3 | Sweating ✓/ breathing (Any ONE)
(Mark first ONE only) | | (1) |
| 1.5 | 1.5.1 | (a) Motor neuron ✓ | | (1) |
| | | (b) Sensory neuron ✓ | | (1) |
| | 1.5.2 | Cell body ✓ | | (1) |
| | 1.5.3 | (a) A ✓ Myelin sheath ✓ | | (2) |
| | | (b) C ✓ Dendrites ✓ | | (2) |
| | 1.5.4 | II ✓ | | (1) |

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1

T ✓

DIAGRAM I	DIAGRAM II
Has one cervix ✓	Has two cervixes ✓
Has one uterus ✓	Has two uteruses/uteri ✓

(Mark the first TWO only)

(Any 2 x 2 + 1)

(5)

- 2.1.2 - Ectopic pregnancy ✓
 - Intra-uterine foetal growth restriction ✓
 - Abnormal placentation ✓
 - Foetal malposition ✓

(Any 2 x 1)

(2)

(Mark first TWO only)

- 2.1.3 - The high levels of progesterone ✓
 - inhibit the pituitary gland ✓
 - from releasing the FSH ✓
 - Therefore, no new follicle will develop ✓
 - and no ovum will be released ✓/ ovulation takes place
 - for another fertilisation to occur ✓

(Any 4 x 1)

(4)

- 2.2 - The embryo develops an outer membrane, the chorion ✓
 - and an inner membrane, the amnion ✓
 - The amnion forms a cavity ✓
 - which encloses the amniotic fluid ✓
 - The chorionic villi ✓ that develops from the chorion
 - together with the endometrium ✓
 - forms the placenta ✓
 - A hollow tube called the umbilical cord ✓ attaches
 - the embryo to the placenta ✓
 - The umbilical cord consists of an umbilical artery ✓
 - and an umbilical vein ✓

(Any 8 x 1)

(8)

2.3 2.3.1 Blood vessels ✓

(1)

- 2.3.2 - Blood vessels/ part A constricts ✓/vasoconstriction occurs
 - causing less blood flow to the surface of the skin ✓
 - therefore, less heat is lost ✓ to the environment

(3)

- 2.3.3 - There will be a reduced/no supply of oxygen ✓ and
 - glucose to the skin cells ✓
 - resulting in lower/no metabolism ✓/cellular respiration/less heat
 energy

(3)

- 2.3.4 - Secretion of less/no sweat causes less evaporation ✓/less
 cooling
 - which leads to an increase in body temperature ✓/overheating
 - This will result in the denaturing of the enzymes ✓
 - which will cause metabolic processes to stop ✓

(4)

- 2.4 2.4.1 - Eyes are closed ✓/ blind
 - No feathers ✓
 - Cannot move ✓ (Any 2 x 1)
(Mark first TWO only) (2)
- 2.4.2 - Not accessible to many predators ✓
 - since they cannot run from them ✓
 - Therefore, increasing the chances of survival ✓ (3)
- 2.4.3 - The yolk volume in precocial birds will be more ✓ than in altricial
 - because it needs more nutrients ✓
 - to be born fully developed ✓ (3)
- 2.5 2.5.1 (a) Zinc supplement ✓ (1)
 (b) Testosterone levels in the blood ✓ (1)
- 2.5.2 - Testosterone levels in the blood were measured ✓
 - before the administering of the zinc supplement ✓ (2)
- 2.5.3 - Type of zinc product ✓
 - Concentration of zinc ✓
 - Volume of zinc ✓
 - Way of administering the zinc ✓
 - Time of administering the zinc supplement ✓ (Any 2 x 1) (2)
(Mark first TWO only)
- 2.5.4 - 60 males were used ✓
 - Investigation was done over a period of 12 weeks ✓/ 6 weeks (Any 2 x 1) (2)
(Mark first TWO only)
- 2.5.5 Zinc supplements increase the testosterone levels in the blood ✓✓ (2)
- 2.5.6 - Stimulates the production of sperm cells ✓
 - Stimulates puberty ✓ (2)
(Mark first TWO only) (2)

[50]

QUESTION 3

- 3.1 3.1.1 Cochlea (1)
- 3.1.2 Transmits impulses to the brain ✓ (1)
(Mark first ONE only)
- 3.1.3 To prevent echo ✓ (1)
- 3.1.4 - Sudden changes in the speed and direction of head movement ✓
- stimulates the cristae ✓
- in the semi-circular canals ✓
- A change in the position of the head ✓
- stimulates the maculae ✓
- in the utricle and saccule ✓
- to send the impulse ✓
- via the auditory nerve ✓
- to be interpreted in the cerebellum ✓
- Cerebellum sends impulses to skeletal muscles ✓ to restore balance (Any 7 x 1) (7)
- 3.1.5 - No vibrations will occur ✓
- and no pressure waves will be created in the inner ear ✓
- Organ of Corti/hair cells will not be stimulated ✓
- Therefore, no impulses will be sent to the cerebrum ✓ (4)
- 3.2 3.2.1 To expose leaves to light for photosynthesis ✓ (1)
(Mark first ONE only)
- 3.2.2 Geotropism ✓/ gravitropism (1)
- 3.2.3 To eliminate the effect of gravity ✓/ expose the stem to gravity on all sides (1)
- 3.2.4 - Auxins will move to the lower side of the growing tip ✓
- There will be a high concentration of auxin in the lower side ✓ stem
- which will stimulate cell elongation ✓/ growth
- Therefore, the lower side will grow faster ✓
- This will cause the stem to bend upwards ✓ (5)
- 3.2.5 - The auxin ✓
- produced at the tip of the stem ✓ will be removed
- Therefore, stem will not grow ✓
- Lateral branches will develop ✓
- in the absence of apical dominance ✓ (Any 4 x 1) (4)
- 3.2.6 Gibberellins ✓ (1)

- 3.3 3.3.1 Cornea ✓ (1)
- 3.3.2 - The circular muscles relax ✓
 - While the radial muscles contract ✓
 - to cause the pupil to dilate ✓ (Any 2 x 1) (2)
- 3.3.3 - Muscles in Part A / ciliary muscles will contract ✓
 - Causing the suspensory ligaments to slacken ✓
 - Resulting in the lens becoming more rounded ✓/convex (3)
- 3.3.4 (a) C ✓ (1)
- (b) - If the drainage channels are fully blocked ✓
 - the excess fluid accumulates in the eye ✓ (2)
- (c) - When the photoreceptors are damaged the stimuli cannot
 be converted to nerve impulses ✓
 - The damage to optic nerve prevents the transmission
 nerve impulses ✓
 - to the cerebrum for interpretation ✓ (3)
- 3.4 3.4.1 (a) Kidney ✓ (1)
- (b) Aldosterone ✓ (1)
- 3.4.2 (a) - Salt levels in the blood decreases ✓
 - Because less/ no aldosterone is secreted ✓
 - Therefore, renal tubules are less permeable ✓
 - Less salt is reabsorbed into blood ✓
 - since salt levels are above normal in blood ✓ (5)
- (b) - There will be less salt in the urine ✓
 - Because renal tubules are more permeable to salt ✓
 - More salt is reabsorbed into blood ✓
 - Since salt levels were below normal in the blood ✓ (4)
- [50]**

TOTAL SECTION B: 100
GRAND TOTAL: 150