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**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2023

**LIFE SCIENCES P1
MARKING GUIDELINE**

MARKS: 150

This marking guideline consists of 11 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 the 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**

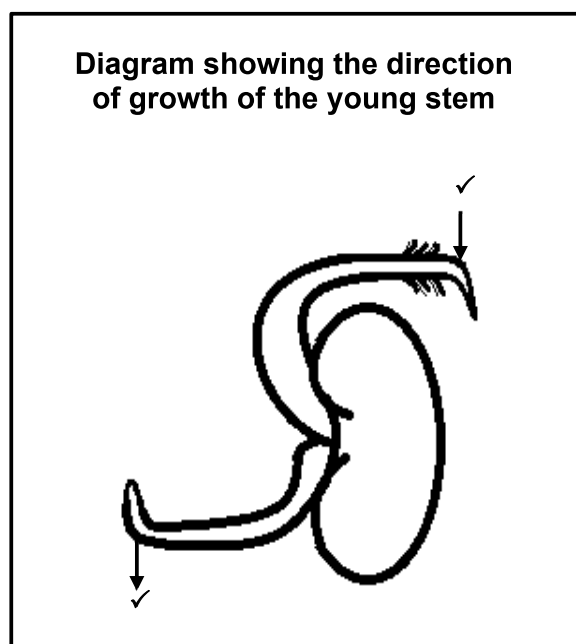
- | | | | | |
|-----|-------|--|---------|------|
| 1.1 | 1.1.1 | C ✓✓ | | |
| | 1.1.2 | D ✓✓ | | |
| | 1.1.3 | B ✓✓ | | |
| | 1.1.4 | A ✓✓ | | |
| | 1.1.5 | B ✓✓ | | |
| | 1.1.6 | C ✓✓ | | |
| | 1.1.7 | B ✓✓ | | |
| | 1.1.8 | A ✓✓ | | |
| | 1.1.9 | B ✓✓ | (9 x 2) | (18) |
| | | | | |
| 1.2 | 1.2.1 | Epididymis ✓ | | |
| | 1.2.2 | Menstrual cycle ✓ | | |
| | 1.2.3 | Fallopian tube ✓ | | |
| | 1.2.4 | Blastula ✓/ Blastocyst | | |
| | 1.2.5 | Receptor ✓ | | |
| | 1.2.6 | Aqueous humour ✓ | | |
| | 1.2.7 | Hair cells ✓/ organ of Corti ✓ | | |
| | 1.2.8 | Medulla oblongata ✓ | | |
| | 1.2.9 | Islets of Langerhans ✓ | (9 x 1) | (9) |
| | | | | |
| 1.3 | 1.3.1 | None ✓✓ | | |
| | 1.3.2 | Both A and B ✓✓ | | |
| | 1.3.3 | B only ✓✓ | (3 x 2) | (6) |
| | | | | |
| 1.4 | 1.4.1 | Thermoregulation ✓ | | (1) |
| | 1.4.2 | (a) Vasoconstriction ✓ | | (1) |
| | | (b) Vasodilation ✓ | | (1) |
| | 1.4.3 | (a) B ✓ – Hypothalamus ✓ | | (2) |
| | | (b) E ✓ – Sweat gland ✓ | | (2) |
| | 1.4.4 | - The sweat evaporates ✓ on the surface of skin and
- cools down ✓ the body | | (2) |
| | | | | |
| 1.5 | 1.5.1 | Cell body ✓ | | (1) |
| | 1.5.2 | (a) Dendrite ✓ | | (1) |
| | | (b) Axon ✓ | | (1) |
| | 1.5.3 | Sensory neuron ✓ | | (1) |
| | 1.5.4 | Interneuron ✓ | | (1) |

(EC/SEPTEMBER 2023)**LIFE SCIENCES P1****5**

- | | | | |
|-------|-----|---|-----|
| 1.5.5 | (a) | Deterioration of myelin sheath ✓ | (1) |
| | (b) | Extremely slow ✓ transmission of impulses | (1) |
| | (c) | Multiple Sclerosis ✓ | (1) |

TOTAL SECTION A: 50

2.4.3 Marking guidelines



Marking criteria	Marks
Caption	1
Young shoot bending upwards from the horizontally placed position	1
Young root bending downwards from the horizontally placed position	1

(3)

- 2.4.4
- When the root is placed horizontally ✓
 - auxins move to the lower side ✓
 - due to gravity ✓
 - The high concentration of auxins on the lower side inhibits growth ✓ on the lower side
 - The lower concentration of auxins on the upper side stimulates growth ✓ in the upper side
 - The upper side grows faster ✓/uneven growth takes place
 - causing the root to bend downwards ✓/grow toward gravity

(7)

2.5 2.5.1 Adrenal ✓ gland (1)

2.5.2 Endocrine ✓ system (1)

- 2.5.3 (a)
- The level of aldosterone will be very low ✓ because
 - the high concentration of salt in the blood ✓
 - inhibits the adrenal gland ✓ and cause it
 - to secrete less aldosterone ✓
- (Any 3 x 1) (3)

- (b)
- The concentration of salt in the urine will increase ✓
 - due to less water being reabsorbed ✓
- (2)

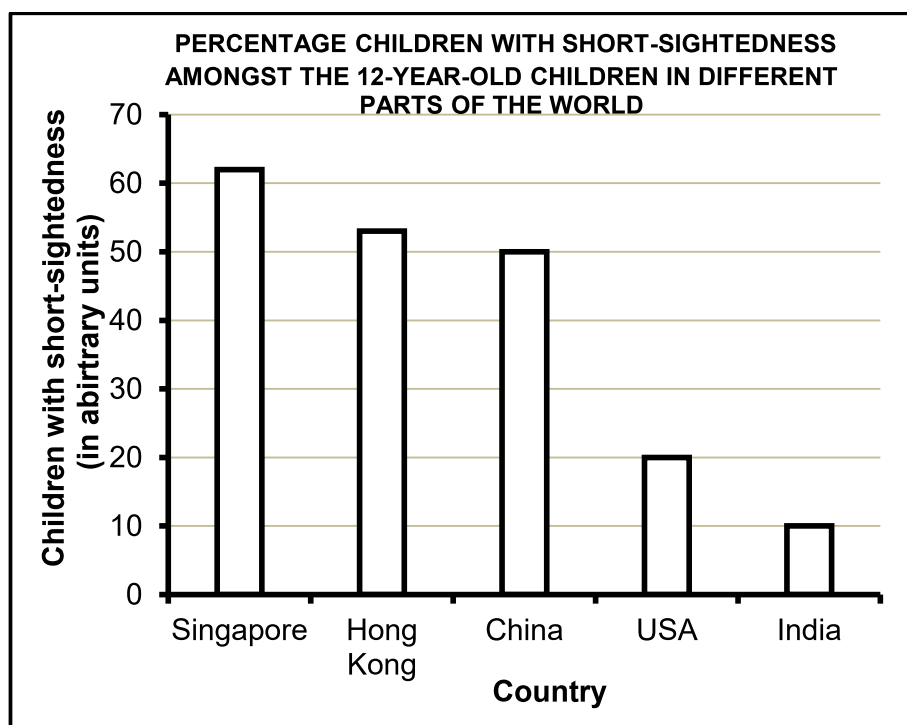
- 2.6 2.6.1 (a) Duration of exposure to cellphone radiation ✓ (1)
- (b) Sperm count ✓ (1)
- 2.6.2 6 ✓/Six times a year (1)
- 2.6.3 - 100 volunteers were used ✓
 - Semen samples were tested 6 times a year ✓
(Mark first ONE only) (Any 1 x 1) (1)
- 2.6.4 Same:
 - Age ✓
 - Health ✓ status/ BMI
 - Diet ✓
 - Activity ✓
 - Lifestyle ✓
 - Person measuring sperm count ✓
(Mark first THREE only) (Any 3 x 1) (3)
- 2.6.5 - The longer/shorter the duration of exposure to cellphone radiation
 the lower/higher the average sperm count. ✓✓ (2)
- 2.6.7 - The loose under-garments allow the scrotum to move away from
 the body if the body temperature rises ✓
 - since spermatogenesis requires a temperature that is lower than
 the body temperature to produce normal healthy sperm ✓ (2)
- [50]**

QUESTION 3

- 3.1 3.1.1 A ✓ (1)
- 3.1.2 - The receptors in the skin receive the stimulus ✓ and
 - convert it to a nerve impulse ✓
 - the sensory neuron ✓ conducts/ transmits the nerve impulse
 - to interneuron ✓ in the spinal cord and it transmits the impulses to
 - the motor neuron ✓ which directs it to the relevant muscle (effector).
 - the muscle contracts ✓ to pull the foot away quickly (Any 5 x 1) (5)
- 3.1.3 (a) D ✓ (1)
- (b) B ✓ (1)
- (c) C ✓ (1)
- (d) A ✓ (1)
- 3.2 3.2.1 Absorbs excess pressure waves ✓/ releases pressure from the inner ear/ from the inner ear/ prevents an echo (1)
- 3.2.2 - Vibrations are transmitted to ear ossicles ✓ and this causes
 - ossicles to amplify ✓
 - and transmit the vibrations to oval window ✓ and its vibrations
 - cause pressure waves ✓
 - in the fluid filled cochlea ✓ and this
 - stimulates hair cells ✓ (organ of Corti) that
 - convert the stimulus into impulses ✓
 - Impulses are transmitted to cerebrum ✓
 - through auditory nerve ✓ (Any 7 x 1) (7)
- 3.2.3 Pharynx ✓/throat (1)
- 3.2.4 - When the pressure in the outer ear increases ✓
 - air moves through the Eustachian tube ✓ into the middle ear
 - to equalise the pressure on the either side of the tympanic membrane ✓
 - to prevent it from bursting ✓ (4)
- 3.3 3.3.1 A ✓ (1)
- 3.3.2 - Eyes closed
 - Unable to move/fly/walk
 - No down feathers
(Mark first ONE only) (Any 1 x 1) (1)

- 3.3.3 - Able to move ✓
so that they can avoid being captured by predators ✓/find food
- Eyes are open ✓
so that they can locate the food sources/avoid predators in advance ✓
- Have down feathers ✓
to keep them warm ✓
- Have ability to find food sources /feed themselves ✓
to survive independent of parents ✓
(Mark first THREE only) (Any 3 x 2) (6)
- 3.4 3.4.1 Lens ✓ (1)
- 3.4.2 - The eyeball is too long ✓
- The lens is too convex ✓/ inability of the lens of the eye to become flat(less convex) (2)
- 3.4.3 - Unable to see distant objects, ✓ but
- able to see near objects ✓/ able see objects less than 6 m from the eyes. (2)
- 3.4.4 Concave lens ✓ (1)

3.4.5



Criteria for marking graph	Mark allocation
Bar graph is drawn (T)	1
Caption of the graph includes both variables (C)	1
Correct labels on <i>x</i> -axis and <i>y</i> -axis including the unit (L)	1
Correct scale for <i>y</i> -axis Equal spaces between bars and equal width of bars for <i>x</i> -axis (S)	1
Plotting: (P) 1–4 co-ordinates plotted correctly All 5 co-ordinates plotted correctly	2

(6)

3.5 Due to the excessive sweating, and insufficient intake of fluids:

- The volume of water in the blood decreases ✓
- Osmoreceptors in the hypothalamus are stimulated ✓ and impulses are sent to pituitary gland ✓
- which secretes more ADH ✓ into the blood causing
- walls of distal convoluted tubule and collecting tubule to become more permeable to water ✓
- More water is reabsorbed into the blood capillaries ✓/less urine formed
- Water level in the blood increases ✓ / level of water in the blood returns to normal

(7)

[50]

TOTAL SECTION B: 50
GRAND TOTAL: 150