

**SENIOR CERTIFICATE EXAMINATIONS**

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| **LIFE SCIENCES P1****2017****MARKING GUIDELINES** |

**MARKS: 150**

**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.

1. **If, for example, three reasons are required and five are given**

 Mark the first three irrespective of whether all or some are correct/ incorrect.

1. **If whole process is given when only a part of it is required**

 Read all and credit the relevant part.

1. **If comparisons are asked for but descriptions are given**

 Accept if the differences/similarities are clear.

1. **If tabulation is required but paragraphs are given**

 Candidates will lose marks for not tabulating.

1. **If diagrams are given with annotations when descriptions are required**

 Candidates will lose marks.

1. **If flow charts are given instead of descriptions**

 Candidates will lose marks.

1. **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.

1. **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.

1. **Wrong numbering**

If answer fits into the correct sequence of questions but the wrong number is given, it is acceptable.

1. **If language used changes the intended meaning**

 Do not accept.

1. **Spelling errors**

If recognisable, accept the answer, provided it does not mean something else in Life Sciences or if it is out of context.

1. **If common names are given in terminology**

Accept, provided it was accepted at the national memo discussion meeting.

1. **If only the letter is asked for but only the name is given (and vice versa)**

Do not credit.

1. **If units are not given in measurements**

 Candidates will lose marks. Memorandum will allocate marks for units separately.

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

All illustrations (diagrams, graphs, tables, etc.) must have a caption.

1. **Code-switching of official languages (terms and concepts)**

A single word or two that appear(s) in any official language other than the learners' 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.

1. **Changes to the memorandum**

No changes must be made to the memoranda without consulting the provincial internal moderator who in turn will consult with the national internal moderator (and the Umalusi moderators where necessary).

1. **Official memoranda**

Only memoranda 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.

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| **SECTION A** |  |  |

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| **QUESTION 1** |  |  |

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| 1.1 | 1.1.11.1.21.1.31.1.41.1.51.1.61.1.71.1.81.1.91.1.10 | C🗸🗸D🗸🗸B🗸🗸D🗸🗸C🗸🗸B🗸🗸A🗸🗸B🗸🗸B🗸🗸 D🗸🗸 (10 x 2) |  | **(20)** |

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| 1.2 | 1.2.1 | Biodiversity🗸 |  |  |
|  | 1.2.2 | Carbon footprint🗸  |  |  |
|  | 1.2.3 | Thermal🗸pollution |  |  |
|  | 1.2.4 | Eutrophication🗸  |  |  |
|  | 1.2.5 | Testosterone🗸 |  |  |
|  | 1.2.6 | Vas deferens🗸 /sperm duct |  |  |
|  | 1.2.7 | Aldosterone🗸  |  |  |
|  | 1.2.8 | Prolactin🗸 |  |  |
|  | 1.2.9 | Cytokinesis🗸 (9 x 1) |  | **(9)** |

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| 1.3 | 1.3.11.3.21.3.3 | A only🗸🗸B only🗸🗸Both A and B🗸🗸  (3 x 2) |  | (2)(2)(2)**(6)** |
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| 1.4 | 1.4.1 | (a) D🗸 Synapse🗸  (b) C🗸 Interneuron🗸/Connector neuron(c) A🗸 Dendrite🗸 |   | (2)(2)(2) |
|  | 1.4.2 | 1. E🗸
2. F🗸
 |  | (1)(1)**(8)** |

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| 1.5 | 1.5.1 | (a) Zygote🗸(b) Morula🗸(c) Placenta🗸 |  | (1)(1)(1) |

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|  | 1.5.21.5.3 | (a) Fertilisation🗸(b) Implantation🗸1. 46🗸/23 pairs
2. 23🗸
 |  | (1)(1)(1)(1)**(7)** |

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| **Total Section A:** |  | **50** |

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| **SECTION B****QUESTION 2** |  |  |

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| 2.1 | 2.1.12.1.22.1.3 | * The hatchling's eyes are closed🗸
* The hatchling can't move🗸
* The hatchling can't feed on its own🗸
* The hatchling has no feathers🗸/The wings are not developed

 (Any 2) **(MARK FIRST TWO ONLY)*** Foetus develops inside the uterus🗸 for greater protection🗸
* Food is supplied by the mother🗸 and is therefore supplied for a longer period. 🗸 (Any 1 x 2)

**(MARK FIRST ONE ONLY)*** More yolk allows for greater development🗸 of the chick
* so that it can be more independent🗸 after hatching
 |  | (2)(2)(2)**(6)** |

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| 2.2 | 2.2.12.2.22.2.3 | Macular degeneration🗸/Retina cells die14.1/142 🗸x 100🗸 = 9.93🗸% (Accept 9.9 and 10%) |  | (1)(3) |

L 🗸

T 🗸

P🗸🗸

Cataract Short-sightedness Long-sightedness

S 🗸

**Mark allocation of the graph**

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| **Criteria** | **Mark allocation** |
| Bar graph drawn (T) | 1 |
| Title of graph  | 1 |
| Correct scale for X-axis (equal width and spacing of the bars) and Y-axis (S) | 1 |
| Correct label and unit for X-axis and Y-axis (L)  | 1 |
| Plotting of the bars (P) | 0: No bars plotted correctly1: 1 to 2 bars plotted correctly2: All 3 bars plotted correctly |

 **NOTE:**

If a line graph is drawn – marks will be awarded for the 'title and label for X and Y axes' only

If a histogram is drawn – marks will be lost for the 'type of graph and correct scale' only

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|  |  |  |  | (6) |

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|  | 2.2.4 | (a) Cataract🗸(b) Short-sightedness🗸 |  | (1)(1)**(12)** |

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| 2.3 | 2.3.12.3.22.3.3 | (a) Crop yields are dropping🗸(b) Water supplies are decreasing🗸395🗸 parts per million🗸/ppm (Accept 394 – 396 ppm)* Decreased photosynthesis🗸
* Less CO2 🗸used from the atmosphere
* therefore more carbon dioxide accumulates in the atmosphere🗸
* This leads to the enhanced greenhouse effect🗸 causing more global warming (Any 3)

 **OR*** Burning of forests 🗸
* Releasing CO2 🗸
* Leading to the enhanced greenhouse effect 🗸

Causing more global warming  |  | (1)(1)(2)(3)**(7)** |

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| 2.4 | * An excessive growth of water hyacinths on the surface of the water will block out the light🗸/deprive submerged plants of sunlight.
* This limits photosynthesis🗸/disrupts food chains/food webs
* Alien plants outcompete the indigenous species🗸/Alien plants have no natural enemies.
* This may lead to some of the indigenous species becoming eliminated🗸/ disruption of the food chain/web
* The great demand of alien plants on natural resources,🗸
* results in less resources being available for the indigenous species🗸

 (3 x 2)**(MARK FIRST THREE ONLY)** |  | **(6)** |

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| 2.5 | 2.5.12.5.22.5.32.5.42.5.52.5.6 | Centriole🗸Metaphase II🗸* Single chromosomes🗸
* arranged at the equator🗸 of the cell
* There is a random arrangement of chromosomes at the equator🗸/the chromosomes flip over
* Causing the chromosomes in the gametes to be different🗸/Chromatids move in different combinations into each gamete
1. 6🗸
2. 3🗸

Crossing over🗸  |  | (1)(1)(2)(2)(1)(1)(1)**(9)****[40]** |

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| QUESTION 3 |  |  |

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| 3.1 | 3.1.13.1.23.1.33.1.43.1.53.1.6 | Does drinking coffee containing caffeine increase stamina? 🗸🗸 1. Amount of caffeine🗸/Presence or absence of caffeine
2. - Stamina🗸

- By measuring the average duration of cycling🗸The average cycling time of the cyclists increased🗸 with the use of caffeine🗸* Decaffeinated coffee serves as a control🗸
* to eliminate any other factor🗸 that may cause an increase in stamina
* Knowing🗸 whether caffeine is taken or not
* may subconsciously influence the performance🗸 of the participants.

**OR*** The participants may think they have more stamina🗸 if they know that they are taking caffeine and
* this may influence their performance🗸
* If too little time passes between the exercise tests, the participants may be tired🗸
* which will influence their stamina for the second cycle test and therefore the validity🗸 of the investigation

**OR*** The participants must be equally rested🗸 for both tests
* to ensure the validity🗸 of the investigation

**OR*** The cyclist may perform better in the second test because they are better warmed up🗸 if the time between the tests is too short.
* This may influence the validity of the investigation🗸 ( Any 1 x 2)
 |  | (2)(1)(2)(2)(2)(2)(2)**(13)** |

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| 3.2 | 3.2.1 | (a) Oestrogen🗸(b) Progesterone🗸 |  | (1)(1) |

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|  | 3.2.2 | * It increases🗸
* the thickness of the endometrium🗸/the blood vessels in the endometrium/the amount of glandular tissue in the endometrium
 |  | (2) |

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|  | 3.2.3 | 1. Release of an ovum🗸 from the ovary/Graafian follicle🗸
2. Day 14🗸
3. LH🗸/Luteinizing hormone
 |  | (2)(1)(1) |

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|  | 3.2.4 | - High levels of hormone B/progesterone will inhibit🗸- the secretion of FSH🗸 **OR*** No new ova/mature follicles 🗸
* Are required during pregnancy 🗸
 |  | (2) |

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|  | 3.2.5 | - The progesterone🗸- levels decreased🗸- because the corpus luteum degenerated🗸 |  | (3)**(13)** |

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| 3.3 | 3.3.13.3.23.3.33.3.4 | Geotropism🗸/gravitropism* Auxins🗸
* accumulate at the lower🗸 part of the stem
* because of gravity🗸
* The higher concentration of auxins at the lower part of the stem stimulates cell elongation🗸/growth on the lower side of the stem
* The lower concentration of auxins at the upper part of the stem inhibits cell elongation🗸/growth on the upper side of the stem

 (Any 4)* The leaves and stem will be carried in such a way that they receive maximum sunlight🗸
* for photosynthesis🗸

 **OR*** Exposes the flowers more favourably 🗸
* For pollination 🗸/seed dispersal

The roots will grow downwards🗸/towards gravity |  | (1)(4)(2)(1)**(8)** |

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| 3.4 | 3.4.13.4.23.4.3 | Hypothalamus🗸* As the level of ADH in the blood increases

the tubular reabsorption of water increases🗸🗸 **OR*** As the level of ADH in the blood decreases

The tubularreabsorption of water decreases 🗸🗸* On a cold day the body loses less water through sweating🗸/ the blood has more water than normal
* The hypothalamus🗸 sends impulses to the
* pituitary gland 🗸
* to secrete less ADH🗸 (Any 3)
 |  | (1)(2)(3)**(6)****[40]** |

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|  |  | **TOTAL SECTION B:** |  | **80** |

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| **SECTION C**QUESTION 4Thermoregulation🗸* Receptors 🗸 in the skin detect the stimulus
* Send impulses to the hypothalamus🗸 of the brain
* The hypothalamus sends impulses to the blood vessels🗸 of the skin
* Blood vessels constrict🗸 (become narrow)/vasoconstriction occurs
* Less blood flows to the skin🗸
* Less heat is lost🗸 from the skin
* Less blood is sent to the sweat glands🗸
* Sweat glands become less active🗸/Less sweat is released
* There is less evaporation of sweat🗸
* and less cooling of the skin🗸 Max

Hearing* The pinna traps the sound waves🗸
* and directs them into the ear canal🗸/meatus
* This causes the tympanic membrane to vibrate🗸
* The vibration is transmitted to the auditory ossicles🗸
* The ossicles amplify the vibration🗸
* and transmit it to the oval window🗸
* The oval window vibrates🗸
* creating pressure waves🗸
* in the endolymph🗸
* which stimulates the Organ of Corti🗸
* The stimulus is converted to an impulse🗸
* The impulse is transmitted via the auditory nerve 🗸
* to the cerebrum🗸
* where sound is interpreted🗸 Max

Content:Synthesis: |  | (8)(9)(17)(3)**(20)** |

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| **ASSESSING THE PRESENTATION OF THE ESSAY** |  |  |

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| **Relevance** | **Logical sequence** | **Comprehensive** |
| All information provided is relevant to the question | Ideas arranged in a logical/ cause-effect sequence | Answered all aspects required by the essay in sufficient detail |
| Only information regarding:* Thermoregulation in cold conditions and
* Hearing is described

No irrelevant information.  | The sequence of events in thermoregulation and hearing is in the correct order. | At least the following points should be included:* Thermoregulation in cold conditions **(5/8)**
* Hearing **(6/9)**
 |
| 1 mark | 1 mark | 1 mark |

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|  |  | **TOTAL SECTION C:** |  | **20** |
|  |  | **GRAND TOTAL:**  |  | **150** |