

**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 | 1.1.1  1.1.2  1.1.3  1.1.4  1.1.5  1.1.6  1.1.7  1.1.8  1.1.9  1.1.10 | 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 | 1.3.1  1.3.2  1.3.3 | 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) |

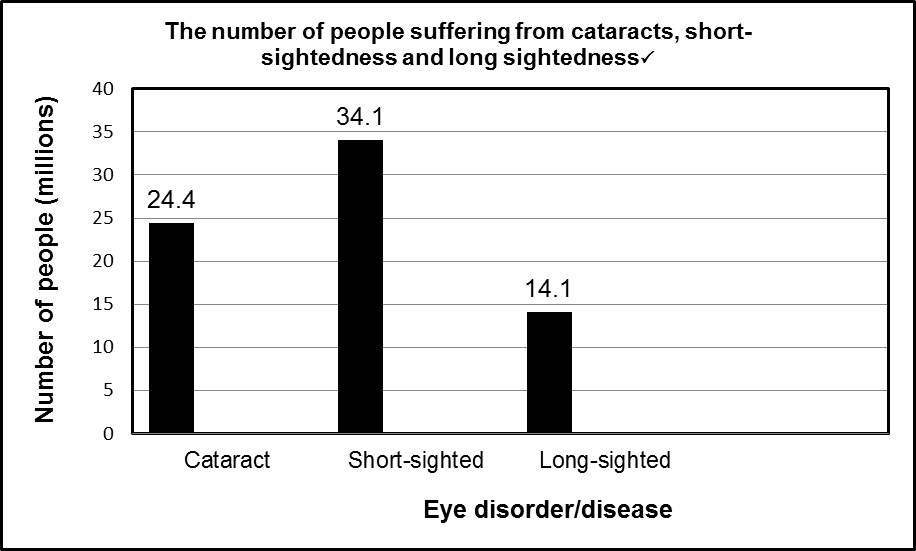
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|  | 1.5.2  1.5.3 | (a) Fertilisation🗸  (b) Implantation🗸   1. 46🗸/23 pairs 2. 23🗸 |  | (1)  (1)  (1)  (1)  **(7)** |

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

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

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| 2.1 | 2.1.1  2.1.2  2.1.3 | * 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 | 2.2.1  2.2.2  2.2.3 | Macular degeneration🗸/Retina cells die  14.1/142 🗸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 correctly  1: 1 to 2 bars plotted correctly  2: 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 | 2.3.1  2.3.2  2.3.3 | (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 | 2.5.1  2.5.2  2.5.3  2.5.4  2.5.5  2.5.6 | 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 | 3.1.1  3.1.2  3.1.3  3.1.4  3.1.5  3.1.6 | 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 | 3.3.1  3.3.2  3.3.3  3.3.4 | 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 | 3.4.1  3.4.2  3.4.3 | 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 4  Thermoregulation🗸   * 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** |