

**PREPARATORY EXAMINATION**

**2019**

**MARKING GUIDELINES**

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| **LIFE SCIENCES (PAPER 1) (10831)** |

**11 pages**

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| **GAUTENG DEPARTMENT OF EDUCATION**  **PREPARATORY EXAMINATION**  **LIFE SCIENCES**  **(Paper 1)**  **MARKING GUIDELINES** |

**PRINCIPLES RELATING TO THE MARKING OF LIFE SCIENCES**

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| 1. | **If more information than marks allocated is given**  Stop marking when maximum marks is reached and place a wavy line and 'max' in the right-hand margin. |  |
|  |  |  |
| 2. | **If, for example, three reasons are required and five are given**  Mark only the first three irrespective of whether all or some are correct / incorrect. |  |
|  |  |  |
| 3. | **If whole process is given when only part of it is required**  Read all and credit relevant part. |  |
|  |  |  |
| 4. | **If comparisons are asked for and descriptions are given**  Accept if 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 is incorrect, do not credit. If sequence and links becomes 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 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. |  |

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| 12. | **Spelling errors**  If recognisable, accept, 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 memo discussion meeting. |  |
|  |  |  |
| 14. | **If only letter is asked for and only name is given (and vice versa)**  No 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 appears 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. |  |
|  |  |  |
| 19. | **Changes to the marking guidelines**  No changes must be made to the marking guidelines without consulting the provincial internal moderator. |  |

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| --- | --- | --- | --- |
| **SECTION A** | | |  |
|  | | |  |
| **QUESTION 1** | | |  |
|  | | |  |
| 1.1 | 1.1.1 | B 🗸🗸 |  |
|  |  |  |  |
|  | 1.1.2 | B 🗸🗸 |  |
|  |  |  |  |
|  | 1.1.3 | C 🗸🗸 |  |
|  |  |  |  |
|  | 1.1.4 | C 🗸🗸 |  |
|  |  |  |  |
|  | 1.1.5 | A 🗸🗸 |  |
|  |  |  |  |
|  | 1.1.6 | D 🗸🗸 |  |
|  |  |  |  |
|  | 1.1.7 | D 🗸🗸 |  |
|  |  |  |  |
|  | 1.1.8 | A 🗸🗸 |  |
|  |  |  |  |
|  | 1.1.9 | D 🗸🗸 |  |
|  |  |  |  |
|  | 1.1.10 | C 🗸🗸 |  |
|  |  | (10 x 2) | **(20)** |
|  |  |  |  |
| 1.2 | 1.2.1 | Altricial 🗸 |  |
|  |  |  |  |
|  | 1.2.2 | Hormone 🗸 |  |
|  |  |  |  |
|  | 1.2.3 | Spermatogenesis 🗸 |  |
|  |  |  |  |
|  | 1.2.4 | Non-disjunction 🗸 |  |
|  |  |  |  |
|  | 1.2.5 | Internal 🗸fertilisation |  |
|  |  |  |  |
|  | 1.2.6 | Geotropism 🗸 |  |
|  |  |  |  |
|  | 1.2.7 | Chiasma🗸 |  |
|  |  | (7 x 1) | **(7)** |
|  |  |  |  |
| 1.3 | 1.3.1 | A only 🗸🗸 |  |
|  |  |  |  |
|  | 1.3.2 | Both A and B 🗸🗸 |  |
|  |  |  |  |
|  | 1.3.3 | B only 🗸🗸 |  |
|  |  | (3 x 2) | **(6)** |
|  |  |  |  |

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| --- | --- | --- | --- |
| 1.4 | 1.4.1 | (a) Corpus callosum 🗸  (b) Spinal cord 🗸 | (1)  (1) |
|  | 1.4.2 | Meninges 🗸 | (1) |
|  |  |  |  |
|  | 1.4.3 | (a) C 🗸 | (1) |
|  |  | (b) B 🗸 | (1) |
|  |  | (c) A 🗸 | (1) |
|  |  | (d) E 🗸 | (1) |
|  |  |  | **(7)** |

|  |  |  |  |
| --- | --- | --- | --- |
| 1.5 | 1.5.1 | Leather shoes 🗸 | (1) |
|  |  |  |  |
|  | 1.5.2 | 300 years 🗸 | (1) |
|  |  |  |  |
|  | 1.5.3 | 20 + 50 + 200 + 100 + 30 = 400 🗸  200 🗸 x 100 = 50%🗸  400 1 | (3) |
|  |  |  | **(5)** |
|  |  |  |  |
| 1.6 | 1.6.1 | (a) Liver 🗸 | (1) |
|  |  | (b) Glucagon 🗸 | (1) |
|  |  | (c) Pancreas 🗸 | (1) |
|  |  |  |  |
|  | 1.6.2 | Diabetes 🗸mellitus | (1) |
|  |  |  |  |
|  | 1.6.3 | Via blood 🗸 | (1) |
|  |  |  | **(5)** |
|  |  |  |  |
|  |  | **TOTAL SECTION A:** | **50** |

|  |  |  |  |
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| **SECTION B** | | |  |
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| **QUESTION 2** | | |  |
|  |  |  |  |
| 2.1 | 2.1.1 | * Low levels of progesterone ✓ * stops the inhibition of FSH 🗸 * to begin the development of a primary follicle 🗸 | (3) |
|  |  |  |  |
|  | 2.1.2 | Oestrogen level continues to increase 🗸 | (1) |
|  |  |  |  |
|  | 2.1.3 | * LH stimulates the conversion of the Graafian follicle 🗸 * into the corpus luteum 🗸 therefore the decrease in oestrogen   **OR**   * The Graafian follicle stops functioning 🗸/ becomes empty * after ovulation 🗸 therefore the decrease in oestrogen | (2) |
|  |  |  |  |
|  | 2.1.4 | * Corpus luteum degenerates 🗸 * Progesterone levels drop 🗸 * and hence the endometrium will not be maintained 🗸 Any | (2) |
|  |  |  |  |
|  | 2.1.5 | * Diploid cells in the ovary ✓/ germinal epithelium * undergo meiosis ✓ * Primary follicles ✓are formed * consisting of haploid cells ✓ * One cell develops into an ovum ✓ inside the Graafian follicle | (5) |
|  |  |  | **(13)** |
|  |  |  |  |
| 2.2 | 2.2.1 | (a) Cowper’s glands 🗸  (b) Scrotum 🗸 | (1)  (1) |
|  |  |  |  |
|  | 2.2.2 | * Secretes alkaline fluid 🗸 * to neutralise the acids produced in the vagina which would kill sperm cells 🗸 | (2) |
|  |  |  |  |
|  | 2.2.3 | * The temperature will be higher than what is required🗸 * and hence sperm production will be affected🗸 * decreasing the chances of fertilisation🗸 Any | (2) |
|  |  |  |  |
|  | 2.2.4 | * The acrosome contains enzymes 🗸 * to dissolve a path into the ovum 🗸 * The middle piece contains mitochondria 🗸 * which release energy 🗸 so that sperms could swim * The presence of a long tail 🗸 * enables sperm cells to swim 🗸 towards the ovum   **(Mark first TWO only)** Any 2 x 2 | (4) |
|  |  |  | **(10)** |

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| 2.3 | 2.3.1 | Anaphase I 🗸 | | (1) |
|  |  |  | |  |
|  | 2.3.2 | * Whole chromosomes 🗸 * are pulled to opposite poles of the cell 🗸 | | (2) |
|  |  |  | |  |
|  | 2.3.3 | Centrosome 🗸/centriole | | (1) |
|  |  |  | |  |
|  | 2.3.4 | (a) | 4 🗸chromosomes | (1) |
|  |  | (b) | 2 🗸chromosomes | (1) |
|  |  |  | |  |
|  | 2.3.5 | * It introduces genetic variation.🗸 | |  |
|  |  |  | |  |
|  |  | * It balances the doubling effect of fertilisation as it halves the number of chromosomes in the sex cells. 🗸   Any | | (1) |
|  |  |  | | **(7)** |
|  |  |  | |  |
| 2.4 | 2.4.1 | * It is the control 🗸 * to verify the results of the experiment 🗸 / to allow for one variable only | | (2) |
|  |  |  | |  |
|  | 2.4.2 | As a result of receiving light from one side only:   * Auxins produced in the tip of the stem ✓ * are unequally distributed ✓ * auxins moved to the shaded side of the stem✓ * where the concentration increased ✓ * thus promoting growth ✓ * whilst the brightly lit side with the lower concentration✓ * inhibited growth ✓ * resulting in the stem bending and growing towards the light ✓   Any | | (6) |
|  |  |  | |  |
|  | 2.4.3 | * Use same type / species of plant 🗸 / seeds * Use same type and amount of soil in the trays 🗸 * Watering at the same time of day 🗸 * Same amount of water given when watering shoots 🗸 * Same environmental conditions 🗸 / temperature / humidity * Same nutrients 🗸   **(Mark first TWO only)** Any | | (2) |
|  |  |  | | **(10)** |
|  |  |  | |  |
|  |  |  | | **[40]** |

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| **QUESTION 3** | | |  |
|  |  |  |  |
| 3.1 | * Ciliary muscles relax 🗸 * Suspensory ligaments tighten (become taut) 🗸 * Tension on the lens increases 🗸 * Lense is less convex (flatter) 🗸 * Light rays are refracted (bent) less 🗸 * Light rays are focused onto the retina 🗸   Any 5 | | **(5)** |
| 3.2 | 3.2.1 | (a) Graph |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Rubric for assessment of the graph   |  |  | | --- | --- | | **Correct type of graph (T)** | **1** | | **Caption for graph (C)** | **1** | | **Correct label for X-axis (including unit) and Y-axis (including unit) (L)** | **1** | | **Correct scale for X-axis and Y-axis (S)** | **1** | | **Plotting of points**  **1 to 4 points correct**  **All 5 points correct** | **1**  **2** | |  | **6** | |  |

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| --- | --- | --- | --- |
|  | **Note:**  If the incorrect graph has been drawn, marks will be lost for “correct type of graph”. If the axes have been switched around, marks will be lost for “correct label for X-axis and Y-axis”. | |  |
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| --- | --- | --- | --- |
|  | 3.2.2 | * There is a rapid increase in the reaction time in older people 🗸 * A slower reaction is more likely to result in accidents 🗸 | (2) |
|  |  |  |  |
|  | 3.2.3 | * The learners did the measurements three times 🗸 * The average was used 🗸   **(Mark first ONE only)** Any | (1) |
|  |  |  | **(9)** |
|  |  |  |  |
| 3.3 | 3.3.1 | (a) A **🗸**  (b) E **🗸** | (1)  (1) |
|  |  |  |  |
|  | 3.3.2 | * Sound vibrations would not pass through to the inner ear  * which means hearing would be affected  | (2) |
|  | 3.3.3 | As he dives:   * A change in direction and speed 🗸of the body * stimulates the cristae 🗸 * A change in the position of the head 🗸 * stimulates the maculae 🗸 * The stimuli are converted into impulses 🗸 * which are transported along the auditory nerve 🗸 * and interpreted by the cerebellum 🗸 * which sends impulses to the muscles 🗸 to restore balance and equilibrium   Any | (6) |
|  |  |  | **(10)** |
| 3.4 | 3.4.1 | * This is a measure of the total amount of carbon dioxide emissions🗸 * of an individual, a defined population or a company per year. 🗸 | (2) |
|  |  |  |  |
|  | 3.4.2 | * Drive less / use public transport, walking, bicycles * Reduce the need for heating by insulating walls  and * build energy efficient homes  * Use alternative energy sources (solar and wind) * Reforestation of trees to act as carbon reservoir * Reuse and recycle   **(Mark first TWO only)** | (2) |
|  |  |  |  |
|  | 3.4.3 | * There will be a significant increase in the number of skin cancer cases  * Ultraviolet rays reaching the earth’s surface may cause permanent damage to eyes    **(Mark first TWO only)** | (2) |
|  |  |  |  |

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| --- | --- | --- | --- |
|  | 3.4.4 | * Burning coal releases CO2 into the atmosphere  * CO2 traps more heat in the atmosphere  * causing the ‘enhanced greenhouse effect’  * which causes average global temperatures to rise  | (4) |
|  |  |  | **(10)** |

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| 3.5 | 3.5.1 | The access, by all people at all times, to adequate / safe / nutritious food | (2) |
|  |  |  |  |
|  | 3.5.2 | * Higher yields 🗸 * Higher income for farmers 🗸 * Less malnutrition 🗸   **(Mark first TWO only)** Any | (2) |
|  |  |  |  |
|  | 3.5.3 | * Introduce the natural enemy of the pest 🗸/ use biological control * This method avoids damage to the environment🗸/ is not affected by the development of resistance | (2) |
|  |  |  | **(6)** |
|  |  |  | **[40]** |
|  |  |  |  |
|  |  | **TOTAL SECTION B:** | **80** |

|  |  |  |  |  |  |
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| **SECTION C** | | | | |  |
|  | | | | |  |
| **QUESTION 4** | | | | |  |
|  | | | | |  |
| **Role of adrenalin (A)**   * The liver 🗸 / muscles * converts glycogen to glucose 🗸 * Rate / depth of breathing increases 🗸 * Heartbeat increases 🗸 * Blood flow to unessential organs decreases 🗸 * allowing greater blood flow to the muscles 🗸 / brain / heart * bringing in more oxygen and glucose 🗸 * making more energy available 🗸 * Muscle tone increases 🗸 (Any 7)   **Temperature regulation (T)**   * Hypothalamus is stimulated 🗸 * and impulses are sent to the blood vessels 🗸 * The blood vessels of the skin constrict 🗸 / vasoconstriction occurs * Less blood flows to the surface of the skin 🗸 * Less heat is lost from the skin 🗸 * Less blood is also sent to the sweat glands 🗸 * Less sweat is released 🗸 * and hence less cooling occurs 🗸 * maintaining a constant body temperature 🗸 (Any 6)   **Pupillary mechanism (P)**   * The iris 🗸 of the eye responds * The circular muscles contract 🗸 * The radial muscles relax 🗸 * The pupil constricts 🗸 * decreasing the amount of light entering the eye 🗸 (Any 4) | | | | |  |
| **NOTE:** NO marks will be awarded for answers in the form of tables, flow charts or diagrams. | | | | | |
| **ASSESSING THE PRESENTATION OF THE ESSAY** | | | | | |
| **Criterion** | **Relevance (R)** | **Logical sequence (L)** | **Comprehensive (C)** | | |
| **Generally** | All information provided is relevant to the topic. | Ideas are arranged in a logical / cause-effect sequence. | All aspects required by the essay have been sufficiently addressed. | | |
| **In this essay** | Only information relevant to   * Role of Adrenalin * Temperature regulation * Pupillary mechanism | Ideas are put in a logical sequence in each of the following:   * Role of Adrenalin * Temperature regulation * Pupillary mechanism | Obtained at least the following:   * Role of Adrenalin (5/7) * Temperature regulation (4/6) * Pupillary mechanism (2/4) | | |
| **Mark** | 1 | 1 | 1 | | |

|  |  |  |
| --- | --- | --- |
|  | **TotAL SECTION C:** | **20** |
|  |  |  |
|  | **TOTAL:** | **150** |