

**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**

|  |  |  |
| --- | --- | --- |
| 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. |  |

|  |  |  |
| --- | --- | --- |
| 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. |  |

|  |  |
| --- | --- |
| **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)** |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 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** |

|  |  |
| --- | --- |
| **SECTION B** |  |
|  |  |
| **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 mitosis ✓
* Primary/numerous follicles ✓are formed
* These undergo meiosis✓
* to form haploid cells ✓
* One cell develops into an ovum ✓ inside the Graafian follicle Any
 | (5) |
|  |  |  | **(13)** |
|  |  |  |  |
| 2.2 | 2.2.1 | (a) Seminal vesicles 🗸(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)** |

|  |  |  |  |
| --- | --- | --- | --- |
| 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]** |

|  |  |
| --- | --- |
| **QUESTION 3** |  |
|  |  |  |  |
| 3.1 | * Ciliary muscles relax 🗸
* Suspensory ligaments tighten (become taut) 🗸
* Tension on the lens increases 🗸
* Lens 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** |

 |  |

|  |  |  |
| --- | --- | --- |
|  | **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”. |  |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | 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) |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | 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)** |

|  |  |  |  |
| --- | --- | --- | --- |
| 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** |

|  |  |
| --- | --- |
| **SECTION C** |  |
| **QUESTION 4** |  |
|  |  |
| **Role of adrenalin (A)*** The liver 🗸 / muscles
* converts glycogen to glucose 🗸
* Rate / depth of breathing increases 🗸
* heartbeat increases 🗸/blood pressure increases
* blood flow to unessential organs/the digestive system and skin decreases 🗸
* allowing greater blood flow to the muscles 🗸/brain/ heart
* increasing metabolic rate of the cells of the muscles and brain making more energy available 🗸/increased respiration rate
* 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** |