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# **NATIONAL**

# **SENIOR CERTIFICATE**

# **GRADE 12**

# **LIFE SCIENCES P1**

**NOVEMBER 2018**

# **MARKING GUIDELINES**

# **MARKS: 150**

**These marking guidelines consist of 11 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 | B🗸🗸B🗸🗸D🗸🗸C🗸🗸C🗸🗸A🗸🗸B🗸🗸C🗸🗸A🗸🗸C🗸🗸 (10 x 2) |  | **(20)** |

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| --- | --- | --- | --- | --- |
| 1.2 | 1.2.1 | Amniotic🗸 egg |  |  |
|  | 1.2.2 | Precocial🗸 development |  |  |
|  | 1.2.3 | Cerebellum🗸 |  |  |
|  | 1.2.4 | Choroid🗸  |  |  |
|  | 1.2.5 | Corpus callosum🗸 |  |  |
|  | 1.2.6 | Hypothalamus🗸  |  |  |
|  | 1.2.7 | Carbon dioxide🗸/CO2  |  |  |
|  | 1.2.8 | Tropisms🗸 |  |  |
|  | 1.2.91.2.10 | Weed-killer🗸/herbicide Poaching🗸  |  | **(10)** |

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| --- | --- | --- | --- | --- |
| 1.3 | 1.3.11.3.21.3.3 | None🗸🗸A only🗸🗸Both A and B🗸🗸 (3 x 2) |  | **(6)** |

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| --- | --- | --- | --- | --- |
| 1.4 | 1.4.1 | Fertilisation🗸 |   | (1) |
|  | 1.4.2 | Mitosis🗸 |  | (1) |
|  | 1.4.3 | * Chorion🗸
* Amnion🗸

**(Mark first TWO only)** |  | (2) |
|  | 1.4.4 | (a)(b)(c) | Zygote🗸Morula🗸Blastocyst🗸/blastula |  | (1)(1)(1) |
|  | 1.4.5 | Fallopian tube🗸/oviduct |  | (1) |
|  | 1.4.6 | 47🗸 |  | (1)**(9)** |

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| 1.5 | 1.5.1 | (a)(b) | Pituitary🗸/hypophysisThyroxin🗸 |  | (1)(1) |

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| --- | --- | --- | --- | --- |
|  | 1.5.21.5.3 | Negative feedback🗸 mechanism* Less hormone B🗸/thyroxin will be secreted
* More hormone A🗸/TSH will be secreted

**(Mark first TWO only)** |  | (1)(2)**(5)** |

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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 | (a)(b) | Prophase I🗸Anaphase I🗸 |  | (1)(1) |

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|  | 2.1.2 |  |  |  |

cell membrane

chromosome

cytoplasm

nucleolus

nuclear membrane

nucleoplasm

nucleus

**Criteria for marking**

|  |  |
| --- | --- |
| Two cells have been drawn (**D**) | 1 mark |
| Each cell contains two un-replicated chromosomes (**C**) | 1 mark |
| Each chromosome is the correct size and correctly shaded (**S**) | 1 mark |
| Any TWO correct labels (**L**) | 2 marks |

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|  |  |  |  |  | (5)**(7)** |

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| 2.2 | 2.2.12.2.22.2.32.2.42.2.5 | * Needed for spermatogenesis🗸/simulates the maturation of sperm cells
* Stimulates the development of secondary male characteristics🗸

**(Mark first ONE only)** Any * Administering testosterone🗸/hormonal treatment
* Surgery🗸

**(Mark first TWO only)** 33⅓🗸/33,3%It increases the risk of testicular cancer🗸**(Mark first ONE only)**  * The temperature of the testes will be too high🗸/not lower than body temperature
* therefore spermatogenesis will not occur🗸/sperm will not mature
 |  | (1)(2)(1)(1)(2)**(7)** |

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| --- | --- | --- | --- | --- |
| 2.3 | 2.3.12.3.22.3.32.3.42.3.52.3.6 | To calculate BMI🗸41/100🗸 x 1510🗸 = 619🗸 (Accept 619,1)Only women with planned pregnancies will know how long it took them to fall pregnant🗸🗸All the women:* were between the ages of 20 and 30 years🗸
* were at least 20 weeks pregnant🗸
* had planned to fall pregnant🗸
* had conceived naturally🗸

**(Mark first ONE only)** AnyDo not smoke if your BMI is <20 and ≥30🗸🗸ORMaintain a BMI between 20 and 29.9🗸🗸* The investigation was repeated🗸
* And very similar/the same results were obtained🗸
 |  | (1)(3)(2)(1)(2)(2)**(11)** |

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| 2.4 | 2.4.12.4.2 | (a)(b)(c)(a)(b) | Transmits sound waves to the tympanic membrane🗸/Secretes ear waxEqualises pressure on either sides of the tympanic membrane🗸Releases pressure from the inner ear🗸Prevent echoes in the earC🗸D🗸 |  | (1)(1)(1)(1)(1) |
|  |  |  |  |  |  |
|  | 2.4.32.4.42.4.5 | * When damaged the receptors cannot convert the stimuli into impulses🗸
* No impulses/fewer impulses are transmitted to the brain🗸/cerebrum
* and the person does not hear anything🗸/hearing is impaired
* The ossicles transmit the vibrations🗸
* from the large tympanic membrane🗸
* to the smaller oval window🗸
* which concentrates the vibrations🗸, amplifying them. Any
* A change in speed/direction of movement🗸
* stimulates the cristae🗸 in the semi-circular canals
* The stimulus is converted to an impulse🗸
* The impulse is transmitted to the cerebellum🗸
* via the auditory nerve🗸
* The cerebellum sends impulses to the muscles to restore balance🗸 Any
 |  | (3)(3)(4)**(15)****[40]** |

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| QUESTION 3 |  |  |

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| 3.1 | 3.1.13.1.23.1.33.1.4 | Auxins🗸(a) Light🗸(b) Gravity🗸Plant structure **B** has bent towards the light🗸/towards **A/positive phototropic*** Auxins accumulated on the lower side of the root🗸
* The high concentration of auxins on the lower side of the root inhibits growth🗸
* The lower concentration of auxins on the upper side stimulates growth🗸
* causing uneven growth🗸/the root to bend downwards Any
 |  | (1)(1)(1)(1)(3)**(7)** |

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| 3.2 | 3.2.13.2.23.2.33.2.43.2.53.2.63.2.7 | A🗸The impulse does not travel to the brain🗸/goes directly from receptor to effector via the spinal cord/interneuron is involved* Allows the person to respond rapidly🗸
* and without thinking🗸/involuntarily
* to an external stimulus🗸
* to prevent damage to the body🗸 Any

Spinal cord🗸/nerve* It acts as an insulator🗸
* and therefore speeds up the nerve impulse🗸/prevents a short circuit
* The person would be able to feel the stimulus🗸
* but would be unable to react🗸
* The receptor receives the stimulus🗸
* and converts it into an impulse🗸
* which is transported via a sensory neuron🗸
* to the spinal cord🗸
* The spinal cord carries the impulse to the cerebrum🗸
* which interprets the stimulus🗸
* The cerebrum sends an impulse to a motor neuron🗸
* which conducts the impulse to the effector🗸
* to bring about a response🗸 Any
 |  | (1)(1)(3)(1)(2)(2)(6)**(16)** |

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| 3.3 | 3.3.13.3.23.3.3 |  The level increases🗸 🗸

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| --- | --- |
| **Fewer larger meals** | **More smaller meals** |
| 1. Maximum blood insulinis higher/more than 160 mg/dl🗸
 | 1. Maximum blood insulin is lower/around 120 mg/dl🗸
 |
| 1. Blood insulin rises and falls three times a day🗸/less often
 | 1. Blood insulin rises and falls six times a day🗸/more often
 |
| 1. The difference between the maximum and minimum insulin levels in the blood is large🗸
 | 1. The difference between the maximum and minimum insulin levels in the blood is small🗸
 |
| 1. Minimum blood insulin is very low🗸/30 mg/dl
 | 1. Minimum blood insulin is higher🗸/40 mg/dl
 |

 **(Mark first TWO only)** 1+ Any 2 x 2  * A diabetic may not produce sufficient insulin🗸
* When eating many smaller meals, less glucose🗸
* enters the blood after each meal🗸
* Less insulin is needed to return blood glucose to normal🗸
 |  | (1)(5)(4)**(10)** |

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| 3.4 | 3.4.13.4.23.4.33.4.4 | B🗸 - The person is sweating🗸 - Vasodilation has occurred🗸/Blood capillaries are dilated**(Mark first TWO only)** Adrenalin🗸- Person **A** is not sweating🗸/sweating less- therefore there is no/little evaporation of water from the skin🗸- and no/less cooling occurs🗸 |  | (1)(2)(1)(3)**(7)** |
|  |  |  |  | **[40]** |

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

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| QUESTION 4The causes of rapid global warming* The concentration of greenhouse gases in the atmosphere has increased🗸
* The burning of fossil fuels🗸/industrialization/use of vehicles
* has released large amounts of CO2🗸/SO2/NO into the atmosphere
* Deforestation🗸
* results in less CO2 being removed from the atmosphere🗸
* The concentration of methane in the atmosphere has increased🗸
* due to the decomposition of organic waste in landfills🗸/rice paddies
* and the increased number of livestock🗸
* This has caused the enhanced greenhouse effect🗸
* More heat is trapped in the atmosphere🗸
* resulting in rising global temperatures🗸 Any

Impact of global warming on weather patterns * Higher temperatures causes more evaporation of water🗸
* The distribution of rainfall changes🗸
* leading to increased rainfall in some areas🗸
* while other areas will experience droughts🗸
* Storms are more severe🗸 Any

How changes in weather patterns affects food security* Food security would decrease🗸
* Crops will no longer grow well at the higher temperatures🗸
* and changed/higher/ lower amount of rainfall🗸
* Wildfires🗸 from dry conditions
* and floods🗸 from high rainfall
* result in the destruction of crops🗸
* or prevents crops being planted🗸
* Floods/wind erode the soil making it less fertile🗸/fewer crops can be grown
* and decrease the amount of farmland available to grow crops🗸
* The loss in biodiversity results in less food being available🗸 Any

Content:Synthesis: |  | (8)(3)(6)(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 |
| All the information provided is relevant to: * The causes of rapid global warming
* The impact of global warming on weather patterns
* How changing weather patterns affect food security

There is no irrelevant information | All the information regarding the:* The causes of rapid global warming
* The impact of global warming on weather patterns
* How changing weather patterns affect food security

Is arranged in a logical manner. | At least the following points should be included:* The causes of rapid global warming (5/8)
* The impact of global warming on weather patterns (2/3)
* How changing weather patterns affect food security (4/6)
 |
| 1 mark | 1 mark | 1 mark |

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