



# basic education

Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

## **NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**LIFE SCIENCES P1**

**NOVEMBER 2018**

**MARKING GUIDELINES**

**MARKS: 150**

**These marking guidelines consist of 9 pages.**

**SECTION A****QUESTION 1**

1.1	1.1.1	B✓✓		
	1.1.2	B✓✓		
	1.1.3	D✓✓		
	1.1.4	C✓✓		
	1.1.5	C✓✓		
	1.1.6	A✓✓		
	1.1.7	B✓✓		
	1.1.8	C✓✓		
	1.1.9	A✓✓		
	1.1.10	C✓✓	(10 x 2)	<b>(20)</b>
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✓/CO <sub>2</sub>		
	1.2.8	Tropisms✓		
	1.2.9	Weed-killer✓/herbicide		
	1.2.10	Poaching✓		<b>(10)</b>
1.3	1.3.1	None✓✓		
	1.3.2	A only✓✓		
	1.3.3	Both A and B✓✓	(3 x 2)	<b>(6)</b>
1.4	1.4.1	Fertilisation✓		(1)
	1.4.2	Mitosis✓		(1)
	1.4.3	- Chorion✓ - Amnion✓		
		<b>(Mark first TWO only)</b>		<b>(2)</b>
	1.4.4	(a) Zygote✓		(1)
		(b) Morula✓		(1)
		(c) Blastocyst✓/blastula		(1)
	1.4.5	Fallopian tube✓		(1)
	1.4.6	47✓		(1)
				<b>(9)</b>

- |     |       |   |            |
|-----|-------|---|------------|
| 1.5 | 1.5.1 | (a) Pituitary✓/hypophysis                   | (1)        |
|     |       | (b) Thyroxin✓                               | (1)        |
|     | 1.5.2 | Negative feedback✓ mechanism                | (1)        |
|     | 1.5.3 | - Less hormone B✓/thyroxin will be secreted |            |
|     |       | - More hormone A✓/TSH will be secreted      |            |
|     |       | <b>(Mark first TWO only)</b>                | (2)        |
|     |       |   | <b>(5)</b> |

**TOTAL SECTION A: 50**

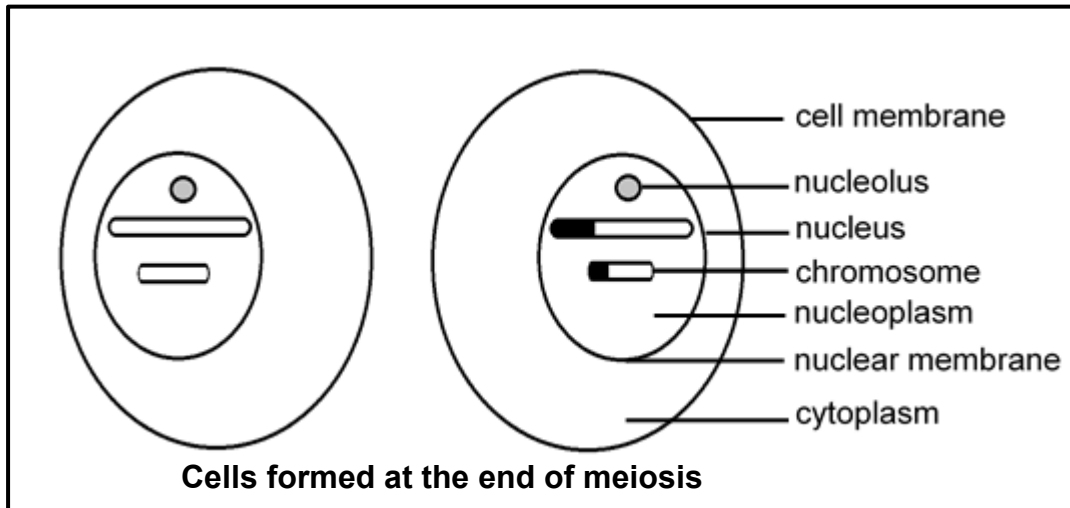


**SECTION B**

**QUESTION 2**

- 2.1 2.1.1 (a) Prophase I ✓ (1)  
(b) Anaphase I ✓ (1)

2.1.2



**Criteria for marking**

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

- (5)  
(7)
- 2.2 2.2.1 - Needed for spermatogenesis ✓  
- Stimulates the development of secondary male characteristics ✓ / deeper voice / facial hair / body hair / increased muscle mass / increase in size of the sex organs / sex drive  
**(Mark first ONE only)** Any (1)
- 2.2.2 - Administering testosterone ✓ / hormonal treatment  
- Surgery ✓ (2)  
**(Mark first TWO only)**
- 2.2.3  $33\frac{1}{3}\%$  ✓ (1)
- 2.2.4 It increases the risk of testicular cancer ✓  
**(Mark first ONE only)** (1)
- 2.2.5 - The temperature of the testes will be too high ✓ / poor blood circulation / increased pressure on the testes  
- therefore sperm will not mature ✓ / spermatogenesis will be negatively affected (2)  
(7)

- 2.3 2.3.1 To calculate BMI✓ (1)
- 2.3.2  $41/100✓ \times 1510✓ = 619✓$  (Accept 619,1) (3)
- 2.3.3 Only women with planned pregnancies will know how long it took them to fall pregnant✓✓ (2)
- 2.3.4 All the women:  
 - were the same age✓/between the ages of 20 and 30 years  
 - were pregnant for the same amount of time✓/at least 20 weeks pregnant  
 - had planned to fall pregnant✓  
 - had conceived naturally✓  
**(Mark first ONE only)** (1)
- 2.3.5 Any (2)
- 2.3.6 Do not smoke if your BMI is  $<20$  or  $\geq 30$ ✓✓ (2)
- 2.3.6 - Similar/same results were obtained✓ (2)  
 - in the second/repeated investigation✓ (11)
- 2.4 2.4.1 (a) Transmits sound waves to the tympanic membrane✓/Secretes ear wax  
**(Mark first ONE only)** (1)
- (b) Equalises pressure on either side of the tympanic membrane✓  
**(Mark first ONE only)** (1)
- (c) Releases pressure from the inner ear✓  
**(Mark first ONE only)** (1)
- 2.4.2 (a) C✓ (1)  
 (b) D✓ (1)
- 2.4.3 - The receptors cannot convert the stimuli into impulses✓  
 - No impulses/fewer impulses are transmitted to the cerebrum✓  
 - and the person does not hear anything✓/hearing is impaired (3)
- 2.4.4 - The sound vibrations are transmitted from the large tympanic membrane✓  
 - to the smaller oval window✓  
 - through the ossicles✓  
 - which are arranged from largest to smallest✓  
 - This concentrates the vibrations✓, amplifying them Any (3)
- 2.4.5 - A change in speed/direction of movement✓  
 - stimulates the cristae✓  
 - 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 (4)

**(15)**  
**[40]**

**QUESTION 3**

- 3.1 3.1.1 Auxins✓ (1)
- 3.1.2 (a) Light✓ (1)
- (b) Gravity✓ (1)
- 3.1.3 Plant structure **B** has bent towards the light✓/towards **A**/positively phototropic (1)
- 3.1.4
- 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/positive geotropism
- Any (3)  
**(7)**
- 3.2 3.2.1 A✓ (1)
- 3.2.2 The impulse does not travel to the brain✓/goes directly from receptor to effector via the spinal cord (1)
- 3.2.3
- Allows the person to respond rapidly✓
  - and without thinking✓/involuntarily
  - to a stimulus✓
  - to prevent damage to the body✓\*
- 1\* compulsory + any other 2 (3)
- 3.2.4 Nerve✓/spinal cord (1)
- 3.2.5
- It acts as an insulator✓
  - and therefore, speeds up the nerve impulse✓/prevents a short circuit
- (2)
- 3.2.6
- The person would be able to feel the stimulus✓
  - but would be unable to react✓
  - because the impulse would not be transmitted to the effector✓
- Any (2)
- 3.2.7
- The receptor receives the stimulus✓
  - and converts it into an impulse✓
  - which is transported by a sensory neuron✓ via the spinal cord to the brain✓\*/cerebrum
  - The brain/cerebrum interprets the impulse✓\*
  - The brain/cerebrum sends an impulse to a motor neuron✓
  - which conducts the impulse to the effector✓
  - to bring about a response✓
- 2\* compulsory + any other 4 (6)  
**(16)**

3.3 3.3.1 The level increases✓ (1)

T✓

3.3.2

Fewer larger meals	More smaller meals
1. Maximum blood insulin concentration is higher✓/between 160-180 mg/dl	1. Maximum blood insulin concentration is lower✓/between 120-140 mg/dl
2. Minimum blood insulin concentration is lower✓/between 20-30 mg/dl	2. Minimum blood insulin concentration is higher✓/40 mg/dl
3. Blood insulin concentration rises and falls three times a day✓/less often	3. Blood insulin concentration rises and falls six times a day✓/more often
4. Large changes in insulin concentration✓/between 140-160 mg/dl	4. Small changes in insulin concentration✓/between 80-100 mg/dl
5. Insulin concentration drops below minimum glucose concentration✓	5. Insulin concentration varies above and below minimum glucose concentration✓

(Mark first TWO only)

1 for table + Any 2 x 2

(5)

3.3.3

- A diabetic may not produce sufficient insulin✓
  - When eating many smaller meals, less glucose✓ enters the blood
  - less insulin✓ is needed
  - to return blood glucose to normal✓
- OR**
- A diabetic may not produce sufficient insulin✓
  - When eating fewer larger meals, more glucose✓ enters the blood
  - more insulin✓ is needed
  - to return blood glucose to normal✓

(4)

(10)

3.4 3.4.1 B✓

(1)

3.4.2

- The person is sweating✓
- Vasodilation has occurred✓

(2)

(Mark first TWO only)

3.4.3

Adrenalin✓

(1)

3.4.4

- Blood vessels are constricted✓
- Less blood is sent to the skin✓/sweat glands
- Less sweat is formed✓/less evaporation occurs
- and less heat is lost✓

Any

(3)

(7)

[40]

**TOTAL SECTION B:**

**80**

**QUESTION 4****The causes of rapid global warming (H)**

- The concentration of greenhouse gases in the atmosphere has increased✓
- The burning of fossil fuels✓/use of vehicles/fires
- and industrial processes✓
- have released large amounts of CO<sub>2</sub>✓/N<sub>2</sub>O/CFC's into the atmosphere
  
- Deforestation✓
- results in less CO<sub>2</sub> being removed from the atmosphere✓
  
- Due to the decomposition of organic waste in landfills✓/rice paddies
- and the increased number of livestock✓
- the concentration of methane/CH<sub>4</sub> in the atmosphere has increased✓
  
- This has caused the enhanced greenhouse effect✓
- More heat is trapped in the atmosphere✓

Any (8)

**Impact of global warming on weather patterns (W)**

- Higher temperatures✓ occur
  
- Heat waves occur✓
- The distribution of rainfall changes✓
- leading to increased rainfall in some areas✓
- while other areas will have decreased rainfall✓/experience droughts
- Storms are more severe✓/frequent

Any (3)

**How changes in weather patterns affects food security (F)**

- Food security decreases✓\*

Changes in rainfall patterns cause:

- Desertification✓
- increased flooding✓
- and wildfires✓
- which increases soil erosion✓ resulting in:
  - o fewer crops to be planted✓
  - o lower crop yields✓
  - o less food for livestock✓
  
- Higher environmental temperatures negatively affects livestock✓/crops
  
- These factors further decrease food availability✓
- Food becomes more expensive✓

1\*compulsory + Any other 5 (6)

Content: (17)  
Synthesis: (3)  
**(20)**



**ASSESSING THE PRESENTATION OF THE ESSAY**

<b>Relevance</b>	<b>Logical sequence</b>	<b>Comprehensive</b>
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: <ul style="list-style-type: none"> <li>- The causes of rapid global warming</li> <li>- The impact of global warming on weather patterns</li> <li>- How changing weather patterns affect food security</li> </ul> There is no irrelevant information	All the information regarding the: <ul style="list-style-type: none"> <li>- The causes of rapid global warming</li> <li>- The impact of global warming on weather patterns</li> <li>- How changing weather patterns affect food security</li> </ul> is arranged in a logical manner.	At least the following points should be included: <ul style="list-style-type: none"> <li>- The causes of rapid global warming <b>(H)</b> (5/8)</li> <li>- The impact of global warming on weather patterns <b>(W)</b> (2/3)</li> <li>- How changing weather patterns affect food security <b>(F)</b> (4/6)</li> </ul>
1 mark	1 mark	1 mark

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

