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)	**(20)**
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_2		
	1.2.8	Tropisms✓		
	1.2.9	Weed-killer✓/herbicide		
	1.2.10	Poaching✓		**(10)**
1.3	1.3.1	None✓✓		
	1.3.2	A only✓✓		
	1.3.3	Both A and B✓✓	(3 x 2)	**(6)**
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) Zygote✓ (b) Morula✓ (c) Blastocyst✓/blastula		(1) (1) (1)
	1.4.5	Fallopian tube✓		(1)
	1.4.6	47✓		(1) **(9)**

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

TOTAL SECTION A: 50

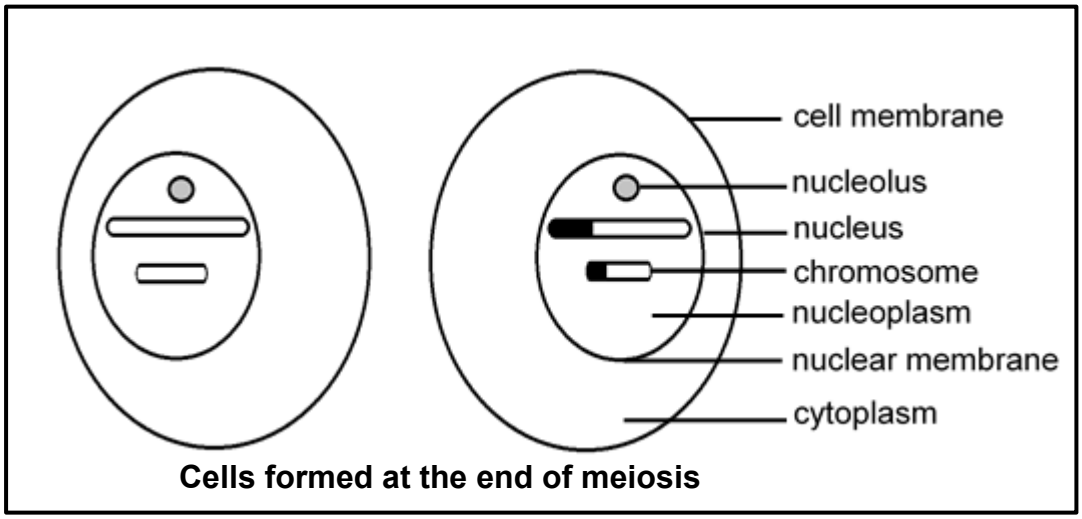
SECTION B

QUESTION 2

2.1 2.1.1 (a) Prophase I✓ (1)

(b) Anaphase I✓ (1)

2.1.2



Cells formed at the end of meiosis

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 33⅓✓ % (1)

2.2.4 It increases the risk of testicular cancer✓ (1)
(Mark first ONE only)

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✓ x 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)

Do not smoke if your BMI is <20 or ≥30✓✓

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 (1)
(Mark first ONE only)

(b) Equalises pressure on either side of the tympanic membrane✓ (1)
(Mark first ONE only)

(c) Releases pressure from the inner ear✓ (1)
(Mark first ONE only)

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_2✓/N_2O/CFC's into the atmosphere

- Deforestation✓
- results in less CO_2 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_4 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:
    - fewer crops to be planted✓
    - lower crop yields✓
    - 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

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 **(H)** (5/8) - The impact of global warming on weather patterns **(W)** (2/3) - How changing weather patterns affect food security **(F)** (4/6)
1 mark	1 mark	1 mark

TOTAL SECTION C: 20

GRAND TOTAL: 150