basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES P1

NOVEMBER 2018

FINAL MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 11 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

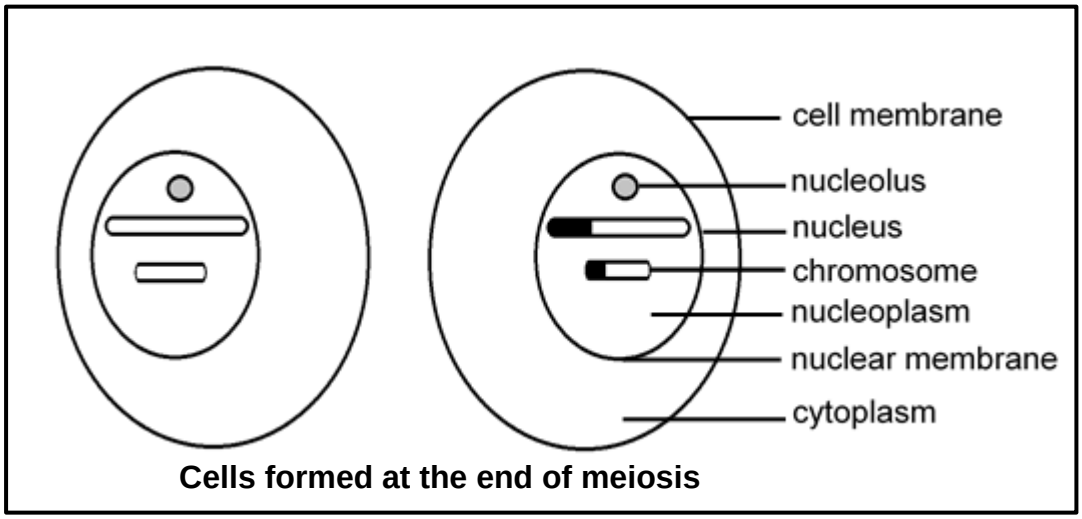
SECTION B

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) Any (1)

2.3.5 Do not smoke if your BMI is <20 or ≥30 (2)

2.3.6
- Similar/same results were obtained
- in the second/repeated investigation (2)

(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 ✓ (3)

Any **(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 (8)
  Any

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 (3)
- Storms are more severe/frequent
  Any

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 (6)
- These factors further decrease food availability✓
- Food becomes more expensive✓ 1*compulsory + Any other 5 (17)

(3)

Content: **(20)**
Synthesis:

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