basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE/ NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES P1

NOVEMBER 2020(2)

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 10 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.

2. **If, for example, three reasons are required and five are given**
   Mark the first three irrespective of whether all or some are correct/incorrect.

3. **If whole process is given when only a part of it is required**
   Read all and credit the relevant part.

4. **If comparisons are asked for, but descriptions are given**
   Accept if the 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 are incorrect, do not credit. If sequence and links become 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 the 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 the answer, 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 national memo discussion meeting.

14. **If only the letter is asked for, but only the name is given (and vice versa)**
    Do not credit.

15. **If units are not given in measurements**
Candidates will lose marks. Marking guidelines 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 appear(s) in any official language other than the learner's 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. The provincial internal moderator must be consulted, who in turn will consult with the national internal moderator (and the Umalusi moderators where necessary).

20. **Official marking guidelines**
Only marking guidelines 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.

SECTION A

QUESTION 1

1.1	1.1.1	B✓✓		
	1.1.2	C✓✓		
	1.1.3	D✓✓		
	1.1.4	C✓✓		
	1.1.5	B✓✓		
	1.1.6	A✓✓		
	1.1.7	C✓✓		
	1.1.8	B✓✓		
	1.1.9	B✓✓		
	1.1.10	C✓✓	(10 x 2)	**(20)**
1.2	1.2.1	Ozone✓/stratosphere		
	1.2.2	Poaching✓		
	1.2.3	Haploid✓		
	1.2.4	Phototropism✓		
	1.2.5	Luteinising✓ hormone/LH		
	1.2.6	Corpus callosum✓		
	1.2.7	Umbilical artery✓		
	1.2.8	Grommet✓		
	1.2.9	Parasympathetic✓nervous system		
	1.2.10	Choroid✓	(10 x 1)	**(10)**
1.3	1.3.1	B only✓✓		
	1.3.2	None✓✓		
	1.3.3	Both A and B✓✓	(3 x 2)	**(6)**
1.4	1.4.1	Acrosome✓		(1)
	1.4.2	Mitochondria✓		(1)
	1.4.3	(a) 3✓		(1)
		(b) 1✓		(1)
		(c) 1✓		(1)
	1.4.4	B✓- Nucleus✓		(2)
	1.4.5	Mitosis✓		(1) **(8)**
1.5	1.5.1	1✓ and 4✓ **(Mark first TWO only)**		(2)
	1.5.2	1✓ and 3✓ **(Mark first TWO only)**		(2)
	1.5.3	2✓ and 3✓ **(Mark first TWO only)**		(2) **(6)**

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 (a) Cerebrum ✓ (1)

(b) Medulla oblongata ✓ (1)

(c) Eustachian tube✓ (1)

2.1.2 G✓ Round window✓ (2)

2.1.3 Hair cells✓/Organ of Corti (1)

2.1.4
- Part B controls vital processes✓/heartbeat/breathing
- These processes will stop✓ leading to death (2)

2.1.5
- The impulses will be interpreted✓
- and sent to the skeletal muscles✓
- to maintain balance✓ (3)

2.1.6
- The oval window/Part F will not vibrate✓ freely
- Fewer/no vibrations will be carried to the cochlea✓/inner ear
- Fewer/no pressure waves will form✓ in the cochlea
- There will be less/no stimulation of the organ of Corti✓/hair cells
- Fewer/no impulses will be transmitted to the cerebrum✓ leading to hearing loss Any (4)

(15)

2.2 For distant vision:
- The ciliary muscle is relaxed✓
- The ciliary body/choroid layer moves backward✓/away from the lens
- The suspensory ligaments are tight✓/taut
- Tension on the lens is increased✓
- The lens is less convex✓/flatter
- Light rays are refracted less✓
- so that a clear image falls on the retina✓/yellow spot Any **(5)**

2.3 2.3.1 5✓µg/dl (1)

2.3.2 $\left[\frac{(25 - 5)}{5}\right]$ ✓ x 100 ✓

= 400✓%

OR

$\left[\frac{(24 - 5)}{5}\right]$ ✓ x 100 ✓

= 380✓%

Accept a range between:
- 24 and 25 for the first value and
- 380% and 400% for the answer (3)

	2.3.3	-	Thyrotoxicosis increases the metabolic rate✓/rate of cellular respiration - More glucose is used✓ - less glucose is stored✓ - fat is broken down✓ causing weight loss	Any	(3)
	2.3.4	-	The high levels of thyroxin✓ in the blood - causes the pituitary gland✓/hypophysis - to secrete less TSH✓ into blood - causing the level of TSH to decrease✓		(4) **(11)**
2.4	2.4.1	-	So that the plant hormone✓/ auxins from the apical tip - could diffuse into the block of agar jelly✓		(2)
	2.4.2	-	The stem stopped growing upwards✓ - Lateral branches developed✓		(2)
	2.4.3	-	(Lateral) branches develop✓ - that can bear more fruit✓/increased yield **OR** - Shorter trees✓ /development of lateral branches - makes harvesting of fruit easier✓	Any (1 x 2)	(2)
	2.4.4	-	Auxins✓in the block of agar jelly - move downwards ✓into the stem - causing (cell) elongation✓/growth resulting in upward growth of the stem		(3) **(9)** **[40]**

QUESTION 3

3.1	3.1.1	Centriole✓/centrosome		(1)
	3.1.2	Anaphase I✓		(1)
	3.1.3	- The spindle fibres contract✓ - The centromeres split✓ - Each chromatid is pulled to the opposite poles✓	Any	(2)
	3.1.4	Crossing over✓		(1)
	3.1.5	It leads to (genetic) variation✓ **(Mark first ONE only)**		(1)
	3.1.6	46✓/23 pairs		(1)
	3.1.7	- Structure B consists of two DNA molecules✓/contains a double thread/is made up of two chromatids - because of DNA replication✓ - Structure C consists of one DNA molecule✓/ contains a single thread/chromatid - because it is unreplicated✓/as a result of the splitting of the chromosome during anaphase 2	Any	(3) **(10)**
3.2	3.2.1	Cervix✓		(1)
	3.2.2	- The site of fertilisation ✓ - The site of zygote division✓ - The transfer of the ovum/embryo to the uterus✓ **(Mark first ONE only)**	Any	(1)
	3.2.3	- Diploid cells in the ovary undergo mitosis✓ - to form numerous follicles✓ - Under the influence of FSH✓ - one cell undergoes meiosis✓ - to form a (haploid) ovum✓	Any	(4)
	3.2.4	- It is a hollow organ✓ - It has a muscular wall✓ - It has a blood-rich lining✓/endometrium **(Mark first ONE only)**	Any	(1)
	3.2.5	- No follicle will develop✓ - No oestrogen produced✓ - and no progesterone produced✓ - Therefore, the endometrium will not develop✓***** to be shed during menstruation	**Compulsory mark✓*1** + Any 2	(3) **(10)**

3.3	3.3.1	Male fertility✓		(1)
	3.3.2	Measuring the sperm count✓		(1)
	3.3.3	- Age✓ - Diet✓ - Exercise✓ - Activity level✓ - Lifestyle✓ - Occupation✓ etc (Accept factors that are NOT related to health; race) **(Mark first TWO only)**	Any	(2)
	3.3.4	- TU inhibits the secretion of testosterone✓ - spermatogenesis cannot take place✓/no sperm will be produced		(2)
	3.3.5	- The higher temperature/pressure on the testes✓ due to the tight underwear - could decrease the sperm count✓/sperm production/lead to the production of abnormal sperm		(2)
	3.3.6	- To determine if TU is still effective after 12 months✓ - To see if the sperm count returns to normal✓ when the treatment stops **(Mark first ONE only)**	Any	(1)
	3.3.7	- No sperm will be transported✓ - from the epididymis to the urethra✓ - Semen without sperm will be released✓	Any	(2) **(11)**
3.4	3.4.1	Eutrophication✓		(1)
	3.4.2	- The crop yield reaches a maximum at the recommended amount✓ - Using more fertilizer will cost more✓ without increasing crop yield - Therefore the profit will be less✓		(3)
	3.4.3	- Less fertiliser will be lost due to run-off✓/leaching **(Mark first ONE only)**		(1)
	3.4.4	- Algal bloom✓ occurs - A layer of algae will form on the water, blocking out sunlight✓ - The (water) plants die because they are unable to photosynthesise✓ - Animals that feed on the plants will also die✓ - Decomposition✓ of the dead plants and animals - cause an increase in the number of bacteria✓*****	**Compulsory mark✓*1** + Any 3	(4) **(9)** **[40]**
			TOTAL SECTION B:	**80**

SECTION C

QUESTION 4

When temperature rises above normal (T):

- Receptors are stimulated✓
- and send impulses to the hypothalamus✓
- The hypothalamus sends impulses to the blood vessels in the skin✓
- and to the sweat glands✓
- The blood vessels in the skin dilate✓/vasodilation takes place
- More blood flows to the surface of the skin✓/sweat glands so that
- (More) heat is lost from the body✓
- More sweat is produced✓ and
- (More) heat is lost when sweat evaporates✓
- The temperature of the body returns to normal✓ Any

When the carbon dioxide levels rise above normal (C): (7)

- Receptor cells in the (carotid) artery in the neck/aorta are stimulated✓
- to send impulses to the medulla oblongata✓
- The medulla oblongata sends an impulse to the breathing muscles✓
- to contract more actively✓
- and increase the rate/depth of breathing✓
- An impulse is also sent to the heart✓
- to beat faster✓
- More carbon dioxide is taken to the lungs✓/exhaled
- The carbon dioxide levels return to normal✓ Any

Importance of carbon dioxide in regulating atmospheric temperature and its influence on global warming (A): (5)

- Carbon dioxide is a greenhouse gas✓
- It traps heat/ prevents it from escaping from the atmosphere✓
- This is called the greenhouse effect✓ which
- keeps the earth warm to make life on earth possible✓
- An increase in carbon dioxide levels in the atmosphere causes an enhanced greenhouse effect✓
- More heat is trapped in the atmosphere✓
- causing an increase in the average global temperature✓ Any

Content (17)
Synthesis (5)

(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 is relevant to: - Homeostatic control of temperature when it rises above normal - Homeostatic control of CO_2 - Importance of CO_2 in regulating atmosphere temperature and its influence on global warming No irrelevant information	The sequence of the events in the: - Homeostatic control of temperature - Homeostatic control of CO_2 - Importance of CO_2 in regulating atmosphere temperature and its influence on global warming are in a logical sequence	The following must be included: - Homeostatic control of temperature (**T: 5/7**) - Homeostatic control of CO_2 (**C: 3/5)** - Importance of CO_2 in regulating atmospheric temperature and its influence on global warming (**A**: **3/5)**
1 mark	1 mark	1 mark

TOTAL SECTION C: 20
GRAND TOTAL: 150