basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES P1

NOVEMBER 2021

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 9 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. Memorandum 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 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.

19. **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).

20. **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.

SECTION A

QUESTION 1

1.1	1.1.1	C✓✓		
	1.1.2	B✓✓		
	1.1.3	D✓✓		
	1.1.4	C✓✓		
	1.1.5	A✓✓		
	1.1.6	B✓✓		
	1.1.7	C✓✓		
	1.1.8	B✓✓		
	1.1.9	A✓✓	(9 x 2)	**(18)**
1.2	1.2.1	Ovulation✓		
	1.2.2	Synapse✓		
	1.2.3	Gestation✓		
	1.2.4	Tropism✓		
	1.2.5	Precocial✓ development		
	1.2.6	Allantois✓		
	1.2.7	Seminiferous✓ tubules		
	1.2.8	Abscisic acid✓	(8 x 1)	**(8)**
1.3	1.3.1	Both A and B✓✓		
	1.3.2	A only✓✓		
	1.3.3	B only✓✓	(3 x 2)	**(6)**
1.4	1.4.1	(a) Vas deferens✓/sperm duct		(1)
		(b) Scrotum✓		(1)
		(c) Penis✓		(1)
	1.4.2	(a) D✓ Epididymis✓		(2)
		(b) G✓ Urethra✓		(2)
		(c) E✓ Testis✓		(2)
	1.4.3	A✓ B✓ E✓ **(Mark first TWO only)**	Any	(2) **(11)**
1.5	1.5.1	(a) Cytoplasm✓		(1)
		(b) Jelly layer✓		(1)
		(c) Tail✓/ Flagellum		(1)
	1.5.2	Mitochondrion✓		(1)
	1.5.3	A✓ and F✓ **(Mark first TWO only)**		(2)
	1.5.4	Oogenesis✓		(1) **(7)**

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 Motor✓ /efferent neuron (1)

2.1.2 C → B → A✓✓ (2)
(Must be in the correct sequence)

2.1.3
- Impulses will be transmitted faster in neuron 1✓✓/ slower in neuron 2
- because of the presence of a myelin sheath in neuron 1✓/ absence of a myelin sheath in neuron 2 (3)

2.1.4
- Impulses from the receptor✓/sensory neuron
- will be transmitted to the central nervous system✓ but
- the impulse will not reach the effector✓ (3)

(9)

2.2 2.2.1 Choroid✓ (1)

2.2.2
- Holds the lens in position✓
- Connects the lens to the ciliary body✓
- Plays a role in accommodation✓ Any (1)

(Mark first ONE only)

2.2.3 (D/the yellow spot) has the highest concentration of cones✓ (1)

2.2.4
- Part B/sclera is opaque✓✓/does not allow light to pass through/ white
- part F/lens is transparent✓✓/allows light to pass into the eye

OR

- Part B/sclera is non-elastic✓✓/maintains the shape of the eye
- part F/lens is elastic✓✓/able to change its shape (4)

(Mark first ONE only)

2.2.5
- The circular muscles relax✓
- The radial muscles contract✓
- causing the pupil to dilate✓ (3)

2.2.6
- The lenses in the spectacles will refract the light rays✓
- The lens of the eye also refracts✓ the light rays
- The light rays will therefore be focused in front of the retina✓ (3)

(13)

2.3 2.3.1 Uterus✓ (1)

2.3.2
- The thickened layer may cause an obstruction✓/blockage
- which may prevent the passage of gametes✓
- preventing fertilisation✓ from taking place

OR

- The thickened layer may cause an obstruction✓/blockage
- which may prevent the embryo from reaching the uterus✓/ implantation could occur in the Fallopian tube
- which may lead to the death of the embryo✓/rupturing of the fallopian tube/miscarriage (3)

2.3.3
- A high concentration of progesterone✓
- inhibits the pituitary gland from secreting FSH✓
- Without FSH a follicle will not develop✓ in the ovary
- Therefore, oestrogen will not be secreted✓ (4)

(8)

2.4
- The pinna of the ear traps sound waves✓
- The auditory canal directs the sound waves to the tympanic membrane✓
- causing the tympanic membrane to vibrate✓
- which causes the ossicles to vibrate✓ and
- pass the vibrations to the oval window✓/amplify the vibrations
- (Pressure) waves are set up in the inner ear✓/perilymph/endolymph
- The organ of Corti is stimulated✓
- and converts the stimuli into impulses✓
- which are transmitted by the auditory nerve✓
- to the cerebrum✓ for interpretation Any **(7)**

2.5	2.5.1	Chorion✓		(1)
	2.5.2	- Acts as a shock absorber✓ - It prevents desiccation✓/dehydration - It helps to keep the temperature within a narrow range✓ - It facilitates free movement✓ of the foetus **(Mark first TWO only)**	Any	(2)
	2.5.3	- The zygote divides by mitosis✓ - to form a (solid) ball of cells✓ - called the morula✓ - which develops into a hollow ball of cells✓ - called the blastula✓/blastocyst	Any	(4)
	2.5.4	- Acts as a micro-filter✓/protect against pathogens - Removal of harmful metabolic waste✓ - Produces antibodies✓ - Maintains the endometrium✓ **(Mark first TWO only)**	Any	(2)
	2.5.5	Umbilical vein✓		(1)
	2.5.6	- In humans the developing foetus receives nutrients from the mother's✓ blood - via the placenta✓/umbilical vein - In oviparous organisms the developing embryo receives nutrients from the yolk✓/albumen	Any	(3) **(13)** **[50]**

QUESTION 3

3.1 3.1.1 Cerebellum✓ (1)

3.1.2 - Connects the two hemispheres of the brain✓
- Allows for communication between the two hemispheres of the brain✓ Any (1)

(Mark first ONE only)

3.1.3 D✓ Cerebrum✓ (2)

3.1.4 (a) Adrenalin✓ (1)

(b)
- More air/oxygen will be inhaled✓
- Blood will be pumped faster✓
- therefore, transporting more oxygen and glucose✓ to the skeletal muscles
- which will increase the rate of cellular respiration✓/metabolism (4)

(c)
- Part B/the medulla oblongata is stimulated✓
- and sends impulses to the heart✓and to
- the breathing muscles✓/ intercostal muscles and diaphragm
- More blood is transported to the lungs✓
- and the carbon dioxide is exhaled faster✓ (4)
- and the carbon dioxide levels return to normal✓ Any **(13)**

3.2 3.2.1 50✓°C (1)

3.2.2 As the temperature increases the average rate of blood-flow to the skin increases✓✓ (2)

3.2.3 $\left.\frac{11-4}{4}\right\}$ ✓ x 100✓ = 175✓% **OR** $\left.\frac{7}{4}\right\}$ ✓ x 100✓ = 175✓% (3)

3.2.4
- As the temperature increases✓ from 20 °C to 45 °C
- vasodilation occurs✓/blood vessels dilate
- to increase the rate of blood flow✓ /more blood flows to the skin
- so that more heat✓/ sweat can be lost (4)

3.2.5
- Less blood flows to the skin✓ at low temperatures
- Less oxygen✓/nutrients reach the cells of the tissue and the cells may die

OR

- Less blood flows to the skin✓ at low temperatures
- More carbon dioxide✓/waste products accumulate in the cells of the tissue and the cells may die (2)

(12)

3.3 3.3.1
- The pituitary gland✓ is stimulated
- to secrete less TSH✓
- Low TSH levels causes the thyroid gland✓
- to secrete less thyroxin✓
- Thyroxin levels return to normal✓ (5)

3.3.2
- The rate of metabolism/respiration in the body decreases✓
- Less glucose will be broken down✓
- and more glucose will be converted and stored as fat✓/glycogen (3) **(8)**

3.4 3.4.1 Stem growth✓ (1)

3.4.2
- To remove the source of auxins✓
- The tip produces auxins✓ Any (1)

3.4.3 To increase the reliability✓/validity of the results (1)

3.4.4 B✓ and C✓ (2)

3.4.5
- The presence of auxins✓ in the tip of the stem
- stimulate upward growth✓
- and inhibit development of lateral branches✓ (3)

3.4.6 (a) Gibberellins✓ (1)

(b) Abscisic acid✓ (1) **(10)**

3.5 3.5.1 Internal✓ fertilisation (1)

3.5.2
- Internal fertilisation✓ increases the chances of fertilisation✓
- Ovovivipary✓/ eggs retained inside the female's body where they are protected✓

(Mark first TWO only) (2 x 2) (4)

3.5.3
- To increase the chances of fertilisation✓/ the survival of the eggs/ number of offspring
- As eggs may be lost to predators✓/environmental factors etc
- Since there is external fertilisation✓ Any (2) **(7)**

[50]

TOTAL SECTION B: 100
GRAND TOTAL: 150