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# 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)	<b>(18)</b>
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)	<b>(8)</b>
1.3	1.3.1	Both A and B✓✓		
	1.3.2	A only✓✓		
	1.3.3	B only✓✓	(3 x 2)	<b>(6)</b>
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✓	Any	(2)
		<b>(Mark first TWO only)</b>		<b>(11)</b>
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✓		(2)
		<b>(Mark first TWO only)</b>		
	1.5.4	Oogenesis✓		(1)
				<b>(7)</b>

**TOTAL SECTION A: 50**

**SECTION B****QUESTION 2**

- |     |       |  |     |             |
|-----|-------|--|-----|-------------|
| 2.1 | 2.1.1 | Motor✓ /efferent neuron  |     | (1)         |
|     | 2.1.2 | C → B → A✓✓<br><b>(Must be in the correct sequence)</b>  |     | (2)         |
|     | 2.1.3 | - Impulses will be transmitted faster in neuron 1✓✓/ slower in neuron 2<br>- 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<br>- will be transmitted to the central nervous system✓ but<br>- the impulse will not reach the effector✓   |     | (3)         |
|     |       |  |     | <b>(9)</b>  |
| 2.2 | 2.2.1 | Choroid✓   |     | (1)         |
|     | 2.2.2 | - Holds the lens in position✓<br>- Connects the lens to the ciliary body✓<br>- Plays a role in accommodation✓  | Any | (1)         |
|     |       | <b>(Mark first ONE only)</b>   |     |             |
|     | 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<br>- part F/lens is transparent✓✓/allows light to pass into the eye<br><b>OR</b><br>- Part B/sclera is non-elastic✓✓/maintains the shape of the eye<br>- part F/lens is elastic✓✓/able to change its shape |     | (4)         |
|     |       | <b>(Mark first ONE only)</b>   |     |             |
|     | 2.2.5 | - The circular muscles relax✓<br>- The radial muscles contract✓<br>- causing the pupil to dilate✓  |     | (3)         |
|     | 2.2.6 | - The lenses in the spectacles will refract the light rays✓<br>- The lens of the eye also refracts✓ the light rays<br>- The light rays will therefore be focused in front of the retina✓   |     | (3)         |
|     |       |  |     | <b>(13)</b> |

- 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	<ul style="list-style-type: none"> <li>- Acts as a shock absorber✓</li> <li>- It prevents desiccation✓/dehydration</li> <li>- It helps to keep the temperature within a narrow range✓</li> <li>- It facilitates free movement✓ of the foetus</li> </ul>	Any	(2)
		<b>(Mark first TWO only)</b>		
	2.5.3	<ul style="list-style-type: none"> <li>- The zygote divides by mitosis✓</li> <li>- to form a (solid) ball of cells✓</li> <li>- called the morula✓</li> <li>- which develops into a hollow ball of cells✓</li> <li>- called the blastula✓/blastocyst</li> </ul>	Any	(4)
	2.5.4	<ul style="list-style-type: none"> <li>- Acts as a micro-filter✓/protect against pathogens</li> <li>- Removal of harmful metabolic waste✓</li> <li>- Produces antibodies✓</li> <li>- Maintains the endometrium✓</li> </ul>	Any	(2)
		<b>(Mark first TWO only)</b>		
	2.5.5	Umbilical vein✓		(1)
	2.5.6	<ul style="list-style-type: none"> <li>- In humans the developing foetus receives nutrients from the mother's✓ blood</li> <li>- via the placenta✓/umbilical vein</li> <li>- In oviparous organisms the developing embryo receives nutrients from the yolk✓/albumen</li> </ul>	Any	(3)
				<b>(13)</b>
				<b>[50]</b>



**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  $\frac{11-4}{4} \Bigg] \checkmark \times 100 \checkmark = 175 \checkmark \% \quad \text{OR} \quad \frac{7}{4} \Bigg] \checkmark \times 100 \checkmark = 175 \checkmark \% \quad (3)$
- 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	<ul style="list-style-type: none"> <li>- The pituitary gland✓ is stimulated</li> <li>- to secrete less TSH✓</li> <li>- Low TSH levels causes the thyroid gland✓</li> <li>- to secrete less thyroxine✓</li> <li>- Thyroxine levels return to normal✓</li> </ul>		(5)
	3.3.2	<ul style="list-style-type: none"> <li>- The rate of metabolism/respiration in the body decreases✓</li> <li>- Less glucose will be broken down✓</li> <li>- and more glucose will be converted and stored as fat✓/glycogen</li> </ul>		(3) <b>(8)</b>
3.4	3.4.1	Stem growth✓		(1)
	3.4.2	<ul style="list-style-type: none"> <li>- To remove the source of auxins✓</li> <li>- The tip produces auxins✓</li> </ul>	Any	(1)
	3.4.3	To increase the reliability✓/validity of the results		(1)
	3.4.4	B✓ and C✓		(2)
	3.4.5	<ul style="list-style-type: none"> <li>- The presence of auxins✓ in the tip of the stem</li> <li>- stimulate upward growth✓</li> <li>- and inhibit development of lateral branches✓</li> </ul>		(3)
	3.4.6	(a) Gibberellins✓		(1)
		(b) Absciscic acid✓		(1)
				<b>(10)</b>
3.5	3.5.1	Internal✓ fertilisation		(1)
	3.5.2	<ul style="list-style-type: none"> <li>- Internal fertilisation✓ increases the chances of fertilisation✓</li> <li>- Ovovivipary✓/ eggs retained inside the female's body where they are protected✓</li> </ul>		
		<b>(Mark first TWO only)</b>	(2 x 2)	(4)
	3.5.3	<ul style="list-style-type: none"> <li>- To increase the chances of fertilisation✓/ the survival of the eggs/ number of offspring</li> <li>- As eggs may be lost to predators✓/environmental factors etc</li> <li>- Since there is external fertilisation✓</li> </ul>	Any	(2) <b>(7)</b> <b>[50]</b>
<b>TOTAL SECTION B:</b>				<b>100</b>
<b>GRAND TOTAL:</b>				<b>150</b>