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# basic education

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Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**LIFE SCIENCES P1  
FEBRUARY/MARCH 2017  
MARKING GUIDELINE**

**MARKS: 150**

**This memorandum consists 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. 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 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 memorandum**  
No changes must be made to the memoranda. The provincial internal moderators must be consulted, who in turn will consult with the national internal moderators (and the Umalusi moderators where necessary).
20. **Official memoranda**  
Only memoranda bearing the signatures of the national internal moderators and the Umalusi moderators and distributed by the National Department of Basic Education via the provinces must be used.

**SECTION A****QUESTION 1**

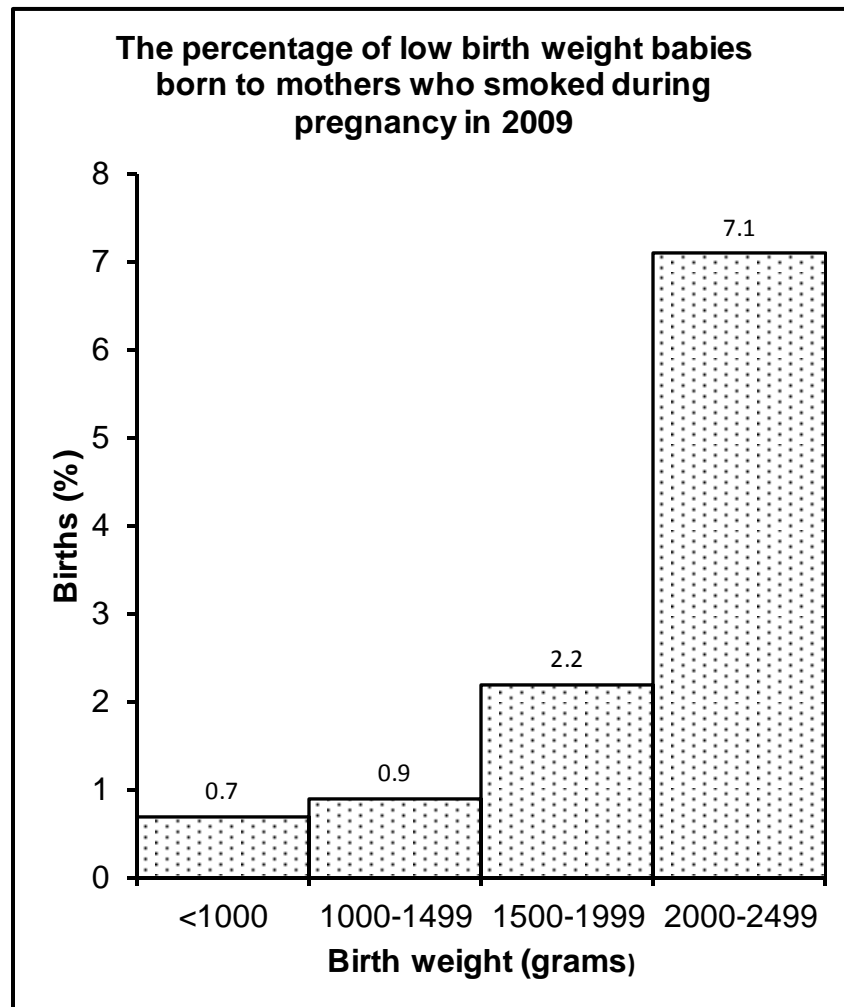
1.1	1.1.1	C✓✓		
	1.1.2	C✓✓		
	1.1.3	C✓✓		
	1.1.4	B✓✓		
	1.1.5	B✓✓		
	1.1.6	C✓✓		
	1.1.7	C✓✓		
	1.1.8	A✓✓		
	1.1.9	D✓✓		
	1.1.10	D✓✓	(10 x 2)	<b>(20)</b>
1.2	1.2.1	Zygote✓		
	1.2.2	Amniotic✓fluid		
	1.2.3	Multiple sclerosis✓		
	1.2.4	Prolactin✓		
	1.2.5	Food security✓		
	1.2.6	Umbilical vein✓/Vein		
	1.2.7	Dendrite✓		
	1.2.8	Diabetes✓	(8 x 1)	<b>(8)</b>
1.3	1.3.1	None✓✓		(2)
	1.3.2	Both A and B✓✓		(2)
	1.3.3	B only✓✓		(2)
			(3 x 2)	<b>(6)</b>
1.4	1.4.1	(a) Centriole✓ (b) Chromosome✓(do not accept homologous chromosome/ chromatid) (c) Centromere✓		(3)
	1.4.2	Anaphase I✓		(1)
	1.4.3	Telophase I✓		(1)
	1.4.4	4✓		(1)
	1.4.5	Oogenesis✓		(1)
				<b>(7)</b>
1.5	1.5.1	(a) Sclera✓ (b) Cornea✓ (c) Pupil✓		(1) (1) (1)
	1.5.2	(a) D✓ – Iris✓ (b) G✓ – Choroid✓ (c) E✓ – Retina✓		(2) (2) (2)
				<b>(9)</b>

**TOTAL SECTION A: 50**

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

- 2.1 2.1.1 Vagina✓/vaginal canal (birth canal not accepted since it is not always a birth canal) (1)
- 2.1.2 - Protects the developing foetus✓  
- Contracts to push the baby out during labour✓  
- Allows for implantation of embryo✓  
- Contracts to push out blood/lining during menstruation✓  
**(MARK FIRST ONE ONLY)** Any (1)
- 2.1.3 Oestrogen✓ (1)
- 2.1.4 It causes the initial thickening of the endometrium✓/endometrium become more vascular and glandular (1)
- 2.1.5 - Sperm✓  
- cannot reach the ovum✓  
- therefore fertilisation cannot take place✓  
**OR**  
- Ovum✓ cannot move into A/the Fallopian tube/oviduct  
- cannot be reached by the sperm✓  
- therefore fertilisation cannot take place✓ (3)  
**(7)**

2.2 2.2.1

**Mark allocation of the graph**

Criteria	Mark Allocation
Histogram drawn (bars must be touching)	1
Title of graph (has both variables)	1
Correct label and unit for X-axis and Y-axis	1
Correct scale for Y-axis and X-axis and width of the bars	1
Drawing of the graph	1: 1 to 3 bars drawn correctly 2: All 4 bars drawn correctly

**NOTE:**

If the wrong type of graph is drawn: Marks will be lost for 'correct type of graph'  
If axes are transposed: Marks will be lost only for labelling of X-axis and Y-axis

If learners draw both graphs on the same system of axes:

- Learners will lose the mark for the title
- If 8 bars are drawn, mark the first 4 bars only

If learners draw two graphs mark the first graph

(6)

- 2.2.2 Babies that weigh 2 500 g or more are considered to be of a normal/healthy birth weight✓ (1)
- 2.2.3 The total percentage of low birth weight babies born to mothers who smoked was higher than those born to mothers who did not smoke✓✓
- OR**
- The total percentage of low birth weight babies born to mothers who did not smoke was lower than those born to mothers who smoked✓✓ (2)
- 2.2.4 - Chemicals dissolved in the mothers blood✓  
- are able to move across the placenta✓/and through the umbilical cord into the babies blood  
- by diffusion✓ Any (2)  
**(11)**
- 2.3 2.3.1 Oviparous✓ (1)
- 2.3.2 Eggs are laid✓ in the nest (1)
- 2.3.3 (a) The graph will decrease more slowly✓at the beginning /not decrease as quickly at the beginning/more convex (1)
- (b) The offspring are protected✓ by the parents for a longer period of time  
Therefore more of them will survive✓ to become adults (2)  
**(5)**
- 2.4 2.4.1 (a) Semi-circular canals✓ (1)  
(b) Eustachian tube✓ (1)  
(c) Oval window✓/fenestra ovalis (1)
- 2.4.2 - A/the tympanic membrane is larger✓/larger surface area  
- than D/the oval window✓/smaller surface area  
- Therefore the incoming sound waves are concentrated on to a smaller area✓  
thus amplifying the sound (3)
- 2.4.3 Allows ossicles/tympanum to vibrate freely✓ (1)  
**(7)**
- 2.5 2.5.1 - Loss of higher thought processes✓/memory/judgement/  
problem solving/any example  
- Loss of one or more of the senses✓/loss of smell/hearing/  
any example  
- Loss of voluntary actions✓/paralysis could occur  
**(MARK FIRST TWO ONLY)** Any (2)
- 2.5.2 - The skull✓/cranium  
- The meninges✓/name of ALL three i.e. pia mater,  
arachnoid and dura mater  
- The cerebrospinal fluid✓  
**(MARK FIRST ONE ONLY)** Any (1)

	2.5.3	- CTE mainly affects the cerebrum✓ - Therefore the medulla oblongata✓ which controls breathing and heart rate - is generally not damaged✓	Any	(2) <b>(5)</b>
2.6	2.6.1	Blood✓		(1)
	2.6.2	- The pituitary gland/hypophysis is malfunctioning✓and secretes large amount of TSH✓ - Thyroid gland secretes less thyroxin✓and this will not have a negative feedback effect on the pituitary gland to secrete less TSH✓ <b>(MARK FIRST TWO ONLY)</b>	(2 x 2)	(4) <b>(5)</b> <b>[40]</b>

**QUESTION 3**

3.1	3.1.1	- To allow time for the auxins from the tip✓ - to diffuse into the agar jelly✓		(2)
	3.1.2	- Auxins from the agar jelly✓ - diffused into the shoot/coleoptile on one side/the left side only✓ - The cells on this side were stimulated to grow✓/elongate - The cells on the other side/right side did not receive auxins✓ - and grew more slowly✓ - This uneven growth✓ caused the stem to bend to the right	Any	(4)
	3.1.3	- Remove the agar jelly completely✓/use agar jelly/substance that does not contain auxins - and place a black box✓ around the tip of the coleoptile		(2) <b>(8)</b>
3.2	3.2.1	6/12✓/6:12		(1)
	3.2.2	- People cannot learn the pattern✓/arrangement/sizes and therefore cheat on the test✓		(2)
	3.2.3	- The ciliary muscles contract✓ - and tension on the suspensory ligaments is released✓/suspensory ligaments slacken - The lens becomes more convex✓/bulges - and its refractive power increases✓ - so that a clear image is formed on the retina✓	Any	(4) <b>(7)</b>

- 3.3 3.3.1 - **The transport of food over long distances**✓  
- **The packaging and processing of food**✓  
**(MARK FIRST TWO ONLY)** (2)
- 3.3.2 - Reduce prices✓  
- Sell locally grown products✓  
- Donate unsold food to charities✓  
- Only buy quantities that they can sell✓  
- Use large refrigerators✓/ storages  
**(MARK FIRST TWO ONLY)** Any (2)
- 3.3.3  $8/60 \times 100 \checkmark = 13,3 \checkmark / 13,33 / 13 \%$  (2)
- 3.3.4 - Crops will fail✓/farmers cannot plant crops therefore less food will be produced✓  
- Decrease in supply of food✓/more food will have to be imported and this food will be more expensive✓ to purchase  
**(MARK FIRST TWO ONLY)** (2 x 2) (4)  
**(10)**
- 3.4 3.4.1 1650✓ (1)
- 3.4.2 - There was an increase in the human population✓  
and a decrease in the parrot population✓ (2)
- 3.4.3 - Humans cut down the trees✓ which are the parrots habitat✓  
- Humans probably killed the parrots✓ for food✓/sport/ as pests  
- Humans introduces diseases✓ that kill the parrots✓  
- Humans introduce other species✓ which use resources that the parrots would normally use✓  
**(MARK FIRST TWO ONLY)** Any (2 x 2) (4)
- 3.4.4 - The organisms that feed on the parrots would probably migrate✓/die  
as they would no longer have any food✓  
- They will have to find an alternative food source✓  
and that will affect other food chains✓ Any (1 x 2) (2)  
**(9)**
- 3.5 - Fertilisers are washed into water bodies when it rains✓/excessive irrigation  
- and cause eutrophication✓  
- The excess nutrients✓ in the fertilisers  
- cause an algal bloom✓  
- The algae block out the sunlight✓  
- and the water plants cannot photosynthesise✓  
- Less oxygen is released into the water✓  
- plants die and bacteria cause decay✓  
- This removes more oxygen from the water✓  
- other organisms then also die✓  
- due to the reduced water quality✓ Any **(6)**  
**[40]**

**SECTION C**

**QUESTION 4**

**Regulating water**

- The water levels in her body are low✓/she is dehydrated
- Osmoreceptors✓
- in the hypothalamus✓ are stimulated by the low water levels and send impulses
- to the pituitary gland✓/hypophysis
- which is stimulated to secrete more ADH✓
- ADH increases the permeability✓
- of the tubules✓/collecting ducts and distal convoluted tubules
- in the kidneys✓
- More water is reabsorbed✓
- and passed to the surrounding blood vessels✓
- Less urine is produced✓
- and the urine is more concentrated✓
- in order to conserve water✓
- Aldosterone✓ is secreted by the adrenal glands
- to ensure more Na<sup>+</sup> ions✓ are reabsorbed by the distal convoluted tubules
- The increase in Na<sup>+</sup> ions in the blood✓
- causes more water to be reabsorbed✓ into the blood capillaries

Max 12

Balance is achieved in the following way:

- The maculae✓
- in the utriculus and sacculus✓ and
- the cristae✓
- in the semi-circular canals✓ are stimulated
- They generate impulses✓
- which is transmitted through the auditory nerve✓
- to the cerebellum✓ where they are interpreted
- Impulses are transmitted via the motor neuron✓
- to skeletal muscles✓

Max 5  
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 sequence.	Answered all aspects required by the essay.
All the information provided is relevant to regulating water and salts and maintaining balance.	All the information regarding regulating water and salts and maintaining balance is arranged in a logical manner.	At least the following marks should be obtained: -Regulating water (8/12) -Balance and equilibrium(3/5)
There is no irrelevant information.		
1 mark	1 mark	1 mark

**TOTAL SECTION C: 20**  
**GRAND TOTAL: 150**