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# basic education

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

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**LIFE SCIENCES P1**

**FEBRUARY/MARCH 2018**

**MARKING GUIDELINES**

**MARKS: 150**

**These marking guidelines consist of 12 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 moderator must be consulted, 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	A✓✓		
	1.1.3	D✓✓		
	1.1.4	B✓✓		
	1.1.5	D✓✓		
	1.1.6	B✓✓		
	1.1.7	C✓✓		
	1.1.8	C✓✓		
	1.1.9	D✓✓		
	1.1.10	C✓✓	(10 x 2)	<b>(20)</b>
1.2	1.2.1	Monoculture✓		
	1.2.2	Biological control✓		
	1.2.3	Blastocyst✓/blastula		
	1.2.4	ADH✓		
	1.2.5	Poaching✓		
	1.2.6	Acrosome✓		
	1.2.7	Prolactin✓		
	1.2.8	Peripheral✓nervous system	(8 x 1)	<b>(8)</b>
1.3	1.3.1	Both A and B✓✓		(2)
	1.3.2	None✓✓		(2)
	1.3.3	Both A and B✓✓		(2)
			(3 x 2)	<b>(6)</b>
1.4	1.4.1	B✓ - Cerebrum✓		(2)
	1.4.2	D✓ - Cerebellum✓		(2)
	1.4.3	A✓ - Pituitary gland✓/Hypophysis		(2)
	1.4.4	C✓ - Corpus callosum✓		(2)
	1.4.5	E✓ - Spinal cord✓		(2)
				<b>(10)</b>
1.5	1.5.1	(a) Diagram 1✓		(1)
		(b) Diagram 2✓ and Diagram 3✓		(2)
		(c) Diagram 1✓ and Diagram 2✓		(2)
	1.5.2	Amniotic✓ egg		(1)
				<b>(6)</b>

**TOTAL SECTION A: 50**

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

- 2.1 2.1.1 (a) FSH✓/Follicle stimulating hormone (1)
- (b) Ovulation✓ (1)
- 2.1.2 - It causes the endometrium✓  
- To become thicker✓/more glandular/more vascular (2)
- 2.1.3 (a)  
- The levels of progesterone drop✓  
- therefore FSH secretion is no longer inhibited✓/FSH secretion is resumed  
- and a new follicle starts to develop✓ (3)
- (b)  
- The levels of progesterone drop✓  
- therefore the endometrium is no longer maintained ✓  
- and menstruation takes place✓ (3)  
**(10)**
- 2.2 2.2.1 Oogenesis✓ (1)
- 2.2.2 - At the end of the process in DIAGRAM I/oogenesis, one✓ gamete/ovum forms/three cells degenerate  
- At the end of the process in Diagram II/spermatogenesis four✓ gametes/sperm form/none of the cells degenerate (2)
- 2.2.3 Testes✓/seminiferous tubules (1)
- 2.2.4 (a) 23✓ (1)
- (b) 23✓ (1)
- 2.2.5 - Crossing over✓  
- Random arrangement✓ of chromosomes (2)  
**(MARK FIRST TWO ANSWERS ONLY)**
- 2.2.6 - This will result in multiple births✓/There will be increased chances of fertilisation  
- which will lead to an increase in human population✓ (2)  
**(10)**
- 2.3 2.3.1 (a) **A** - Refraction of light✓  
- Focus light rays on the retina✓ (Any 1) (1)  
**(MARK FIRST ANSWER ONLY)**
- (b) **C** - Converts light stimuli to impulses✓  
- Forms images✓ (Any 1) (1)  
**(MARK FIRST ANSWER ONLY)**

- 2.3.2 (a) - The pupil/part B can dilate more✓  
- to allow more light to enter the eye✓ (2)
- (b) - The retina/part C has more rods✓  
- enabling them to see in dim light✓ (2)
- 2.3.3 - The radial muscles of the iris relax✓  
- Circular muscle of the iris contract✓  
- The pupil constricts✓  
- and less light enters the eye✓ (4)  
**(10)**
- 2.4 - The cristae✓  
- are stimulated✓  
- The stimuli are converted to impulses✓  
- which are transported via the auditory nerve✓  
- to the cerebellum✓  
- Impulses are sent to the muscles to restore balance✓ (Any 5) **(5)**
- 2.5 2.5.1 - Cover the solid wastes brought in every day with soil✓  
- The landfill site should be lined with clay✓/plastic/rubber  
- No hazardous waste should be dumped at landfill sites✓  
- The leachate should be removed and detoxified✓  
- Remove methane gas from the dumpsite✓  
- Use plants to remove contamination from soil✓ (Any 2) (2)  
**(MARK FIRST TWO ONLY)**
- 2.5.2 - Fewer trees need to be cut down to make paper✓  
- therefore more CO<sub>2</sub> will be absorbed by these trees for photosynthesis✓  
- reducing the amount of CO<sub>2</sub> in the atmosphere✓  
- This reduces the enhanced greenhouse effect✓that causes global warming (Any 3)
- OR**
- Less paper needs to be produced✓  
- Less fossil fuels will be used for the production of paper✓  
- therefore less greenhouse gases will be released✓  
- This reduces the enhanced greenhouse effect✓that causes global warming (Any 3)
- OR**
- The amount of paper in the solid waste is reduced✓  
- therefore less decomposition takes place✓  
- Less greenhouse gases will be therefore released✓  
- This reduces the enhanced greenhouse effect✓that causes global warming (Any 3) (3)  
**(5)**  
**[40]**

**QUESTION 3**

3.1 3.1.1 They are fuels that can be depleted✓/Millions of years required to replace (1)

3.1.2 - CO<sub>2</sub> is released✓ when coal is burned to generate electricity/  
No CO<sub>2</sub> is released when renewable energy or nuclear power is generated (1)

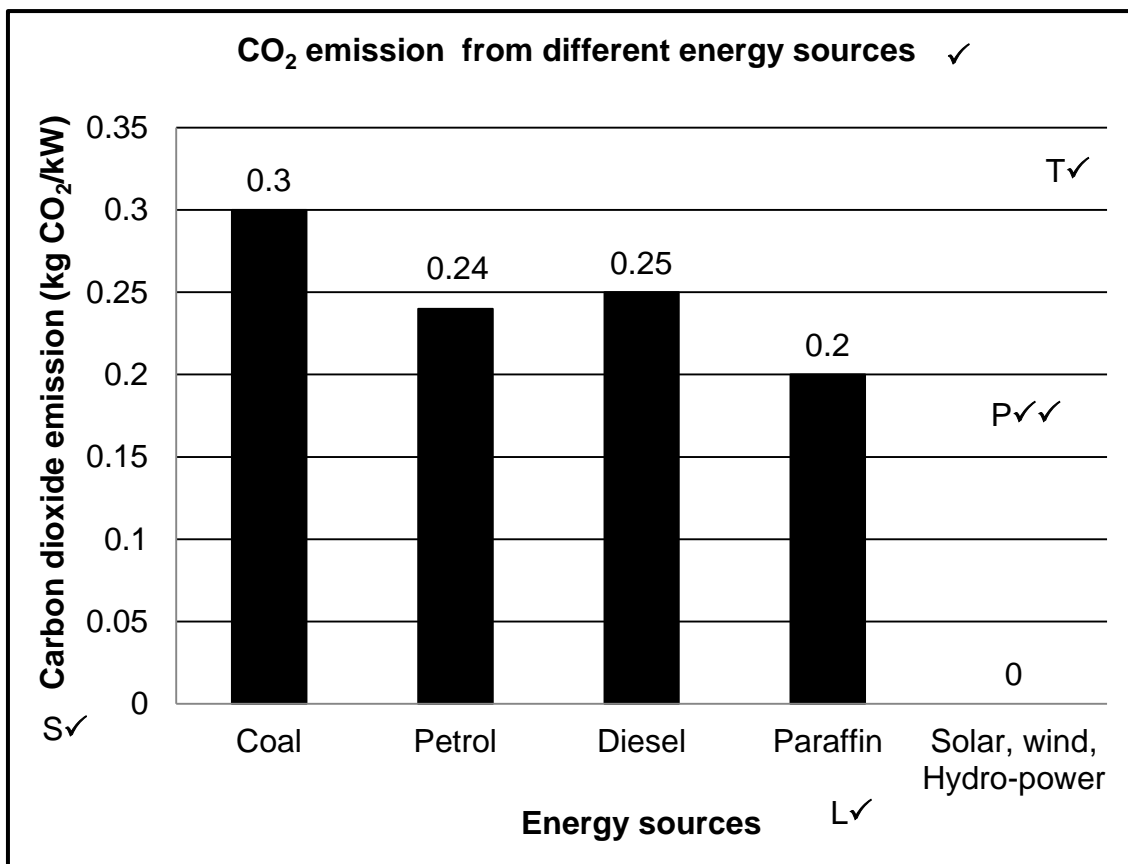
3.1.3

Methane✓/ CH <sub>4</sub>		Carbon monoxide✓/CO
Sulphur dioxide✓/ SO <sub>2</sub>		Water vapour✓/H <sub>2</sub> O(g)
Nitrous oxide✓/ N <sub>2</sub> O		Ozone✓/O <sub>3</sub>

**(MARK FIRST ONE ONLY)** (Any 1) (1)

3.1.4 - An increase in CO<sub>2</sub> leads to global warming✓  
- which causes climate change✓/changes in rainfall patterns  
- that leads to more droughts✓/floods in certain areas  
- resulting in crop losses✓  
- and livestock deaths✓  
- Therefore less food is produced✓ (Any 4) (4)

3.1.5





**Mark allocation of the graph**

Criteria	Marks
Bar graph drawn (T)	1
Title of graph (Including both variables)	1
Correct scale for X-axis (equal width and spacing of the bars) <b>and</b> Y-axis (S)	1
Correct label and unit for X-axis and Y-axis (L)	1
Plotting of the bars (P)	0: No bars plotted correctly 1: 1 to 4 bars plotted correctly 2: All 5 bars plotted correctly

**NOTE:**

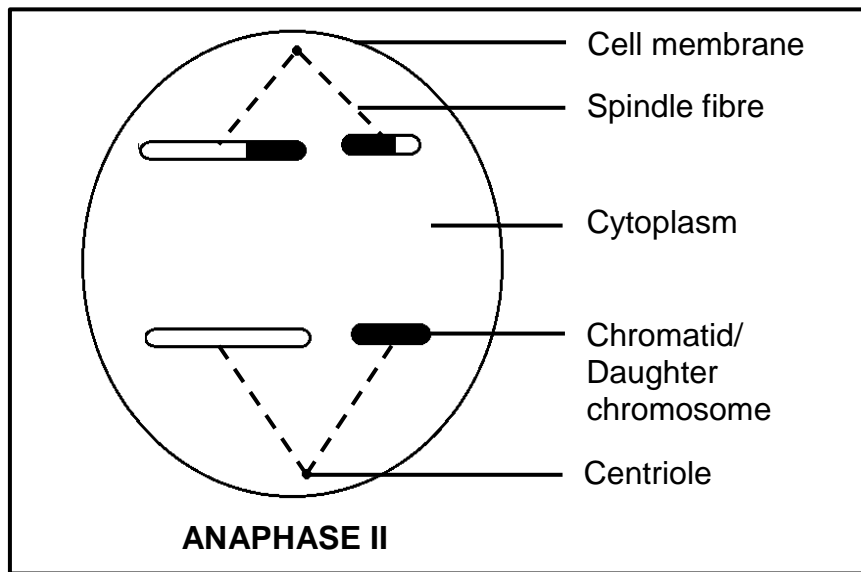
If a line graph is drawn – marks will be lost for the 'type of graph' and for 'plotting' only.

If a histogram is drawn – marks will be lost for the 'type of graph' and 'correct scale' only

(6)  
**(13)**

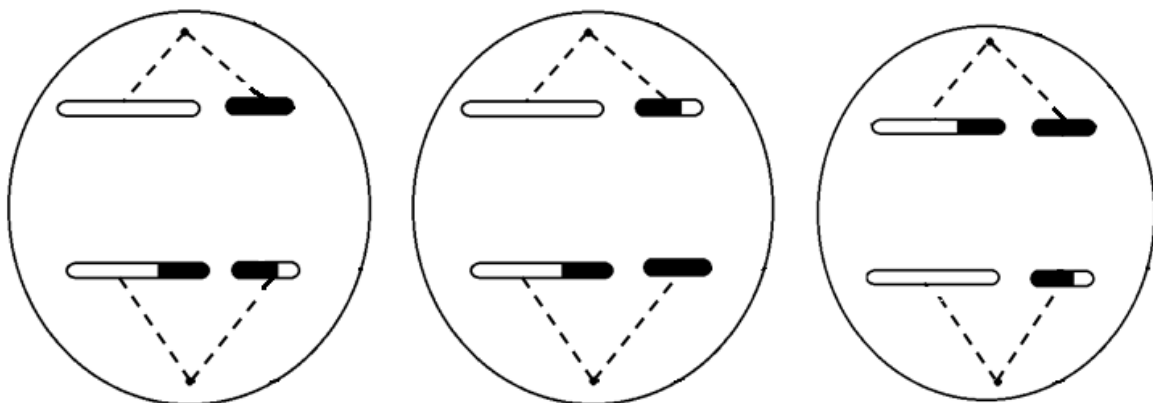
- 3.2 3.2.1 (a) Auxin concentration ✓ (1)
- (b) Plumule growth ✓ (1)
- 3.2.2 For measurement of the plumule length ✓ (1)
- 3.2.3 - To simulate the same conditions ✓ under which germination takes place for the normal growth ✓ of the seedlings  
- To expose the seedlings to uniform light ✓ so that no other variable is introduced/to ensure validity/ to allow upward growth of the plumule for easy measuring ✓  
**(MARK FIRST ONE ONLY)** (Any 1 x 2) (2)
- 3.2.4 - They used seven seedlings in each group ✓ /35 seeds in total/a large sample  
- They calculated the average ✓ increase in plumule length  
**(MARK FIRST ONE ONLY)** (Any 1) (1)
- 3.2.5 - Same species of beans ✓  
- Seedlings of the same age ✓  
- Seedlings of the same size ✓  
- Same temperature ✓  
- The same investigator ✓  
- Identical apparatus (beakers/petri-dishes/graph paper/grid/volume of solution) ✓ (Any 3) (3)  
**(MARK FIRST THREE ONLY)**
- 3.2.6 An increase in auxin concentration up to an optimum stimulates the growth rate of the plumule/stem. With further increase in auxin concentration there is an inhibition of plumule/stem growth ✓✓ (2)  
**(11)**

3.3



OR

ANY ONE OF THE FOLLOWING ARRANGEMENTS INCLUDING CORRECT LABELS



**MARK ALLOCATION FOR DIAGRAM**

Correct phase drawn/chromatids separating ( <b>P</b> )	1
Correct shading of chromatids ( <b>S</b> )	1
Correct number and size of individual chromatids/daughter chromosomes (2 short and 2 long) ( <b>N</b> )	1
Any TWO correct labels	2
<b>TOTAL</b>	<b>5</b>

(5)

- 3.4 3.4.1 - It act as a micro-filter✓/prevents harmful substances from reaching the foetus  
 - It secretes progesterone✓/oestrogen during pregnancy  
 - Immunity is transferred from the mother to the foetus✓ (Any 2) (2)  
**(MARK FIRST TWO ONLY)**

3.4.2

<b>BLOOD VESSEL C</b>	<b>BLOOD VESSEL D</b>
High concentration of nutrients✓/example of nutrient	Low concentration of nutrients✓/example of nutrient
Low concentration of waste products✓/example of waste product	High concentration of waste products✓/example of waste product
High concentration of oxygen✓	Low concentration of oxygen✓
Low concentration of carbon dioxide✓	High concentration of carbon dioxide✓

**(MARK FIRST TWO ONLY)**

Table: (1) and (Any 2 x 2) (5)

- 3.4.3 - Waste products/nitrogenous waste/CO<sub>2</sub> will accumulate✓ in the foetus' body causing the death of the foetus✓ (2)  
**(MARK FIRST ONE ONLY)**

- 3.4.4 - Harmful substances✓/bacteria  
 - may pass from the mother's blood to the blood of the foetus✓  
**OR**  
 - The blood types✓/other proteins of the mother and baby  
 - may not be compatible✓ (2)  
**(11)**  
**[40]**

**TOTAL SECTION B: 80**

**SECTION C****QUESTION 4****Increasing the metabolic rate**

- To increase the metabolic rate the level of thyroxin must increase✓
- The pituitary gland is stimulated✓
- to secrete more TSH✓
- which stimulates the thyroid gland✓
- to secrete more thyroxin✓

(Any 4) (4)

**Increasing the level of glucose**

- As a result of the decrease in glucose level the pancreas is stimulated✓
- to secrete glucagon✓
- which stimulates the conversion of stored glycogen to glucose✓
- in the liver✓/muscles
- The glucose is then released into the bloodstream✓
- The glucose level in the blood increases✓and returns to normal

(Any 5) (5)

**Decreasing the level of CO<sub>2</sub>**

- High CO<sub>2</sub> levels stimulate the receptor cells in the carotid artery✓
- The stimulus is converted to an impulse✓
- and sent to the medulla oblongata✓
- which stimulates the heart✓
- to beat faster✓
- bringing blood with CO<sub>2</sub> quickly to the lungs ✓
- It also stimulates the breathing muscles✓
- to increase the depth and rate of breathing✓
- CO<sub>2</sub> is exhaled quickly from the lungs✓
- The CO<sub>2</sub> level in the blood decreases✓and returns to normal

(Any 8) (8)  
Content: (17)  
Synthesis: (3)  
**(20)**

**ASSESSING THE PRESENTATION OF THE ESSAY**

<b>Relevance</b>	<b>Logical sequence</b>	<b>Comprehensive</b>
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: <ul style="list-style-type: none"> <li>- Mechanism to increase metabolic rate</li> <li>- Mechanism to increase glucose level</li> <li>- Mechanism to decrease CO<sub>2</sub> level</li> </ul> There is no irrelevant information.	All the information regarding the: <ul style="list-style-type: none"> <li>- Mechanism to increase metabolic rate</li> <li>- Mechanism to increase glucose level</li> <li>- Mechanism to decrease CO<sub>2</sub> level</li> </ul> is arranged in a logical manner.	At least the following points should be included: <ul style="list-style-type: none"> <li>- Mechanism to increase metabolic rate <b>(3/4)</b></li> <li>- Mechanism to increase glucose level <b>(3/5)</b></li> <li>- Mechanism to decrease CO<sub>2</sub> level <b>(5/8)</b></li> </ul>
1 mark	1 mark	1 mark

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