



# basic education

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

## **NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**LIFE SCIENCES P1**

**FEBRUARY/MARCH 2016**

**MEMORANDUM**

**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 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**

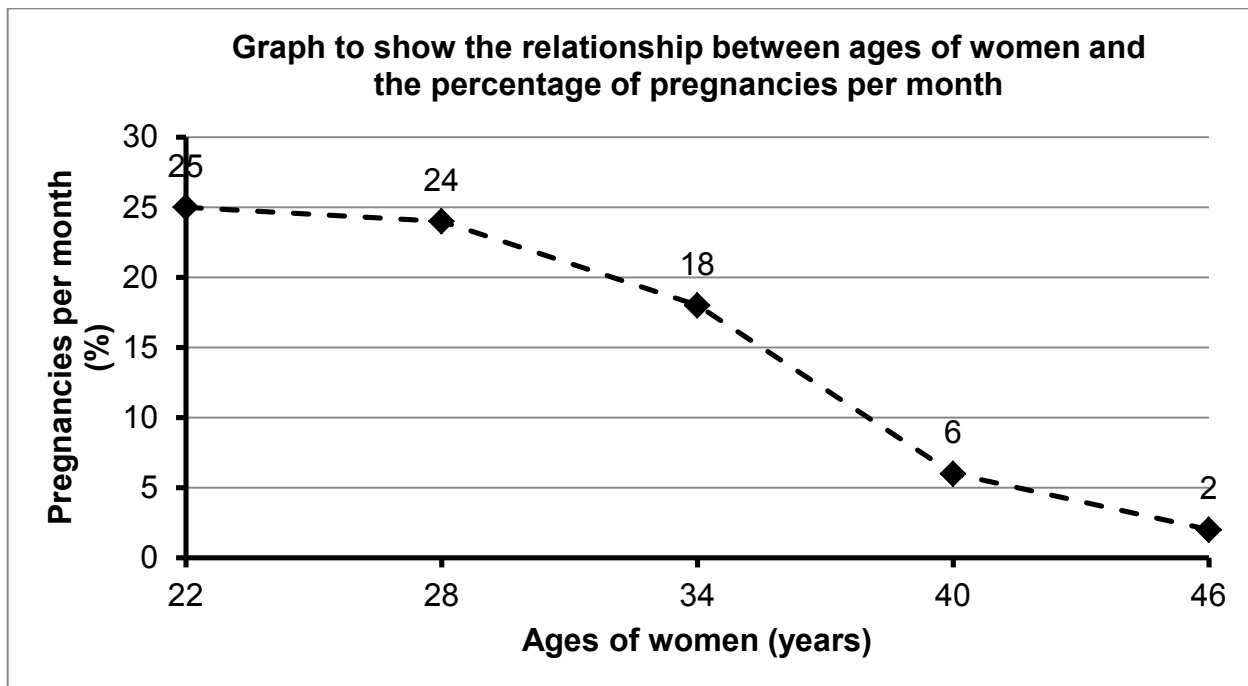
1.1	1.1.1	C✓✓		
	1.1.2	D✓✓		
	1.1.3	C✓✓		
	1.1.4	B✓✓		
	1.1.5	B✓✓		
	1.1.6	C✓✓		
	1.1.7	A✓✓		
	1.1.8	D✓✓		
	1.1.9	B✓✓		
	1.1.10	A✓✓	(10 x 2)	<b>(20)</b>
1.2	1.2.1	Vivipary✓/Viviparous		
	1.2.2	Centrioles✓/Centrosome		
	1.2.3	Geotropism✓/Gravitropism		
	1.2.4	Carbon footprint✓		
	1.2.5	Puberty✓		
	1.2.6	Stimulus✓		
	1.2.7	Grommets✓		
	1.2.8	Pinna✓	(8 x 1)	<b>(8)</b>
1.3	1.3.1	B only✓✓		
	1.3.2	Both A and B✓✓		
	1.3.3	B only✓✓		
	1.3.4	None✓✓	(4 x 2)	<b>(8)</b>
1.4	1.4.1	(a) A✓ - penis✓		(2)
		(b) E✓ - testes✓		(2)
	1.4.2	(a) D✓ and E✓ <b>(Mark first TWO only)</b>		(2)
		(b) B✓ and C✓ <b>(Mark first TWO only)</b>		(2) <b>(8)</b>
1.5	1.5.1	(a) E✓		(1)
		(b) A✓		(1)
		(c) C✓		(1)
	1.5.2	F✓ - motor neuron✓		(2)
	1.5.3	D to E✓		(1)
				<b>(6)</b>

**TOTAL SECTION A: 50**

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

- 2.1 2.1.1 (a) Round window✓ (1)
- (b) Cochlea✓ (1)
- 2.1.2 Cristae✓ (1)
- 2.1.3 (a)
- Impulses from the cochlea cannot be transmitted to the brain✓
  - and therefore hearing will not occur✓ (2)
- 2.1.4 (b)
- Part A will not be able to vibrate✓
  - The round window will not absorb the sound waves✓ from the cochlea
  - and hearing will be affected✓ (Any 2) (2)
- (7)
- 2.2
- Mucus in the middle ear✓
  - will lead to the blockage of the Eustachian tube✓
  - which will not be able to equalise the pressure✓ in the middle ear
  - resulting in pressure on the tympanic membrane✓
  - that may cause the tympanic membrane to burst✓
  - leading to hearing loss✓ (Any 4) (4)

2.3 2.3.1



**Mark allocation of the graph**

Criteria	Mark Allocation
Correct type of graph drawn for the pregnancies per month only	1
Title of graph including the two variables (Age of women and pregnancies per month)	1
Correct label and unit for X-axis and Y-axis	1
Correct scale for X-axis and Y-axis	1
Drawing of the graph	0: No points plotted correctly 1: 1 to 4 points plotted correctly 2: All 5 points plotted correctly

**NOTE:**

If axes are transposed: marks will be lost only for labelling of X-axis and Y-axis

2.3.2 The older the women, the higher the chances of having miscarriages✓✓

**OR**

The younger the women, the lower the chances of having miscarriages✓✓

2.3.3  $50\% \times 12 = 6$ ✓

**OR**

$\frac{50}{100} \times 12 = 6$ ✓

(6)

(2)

(2)  
**(10)**

2.4.1	2.4.1	- As a result of the blocked Fallopian tube✓ - the sperm cannot reach the ovum✓ - therefore fertilisation cannot take place✓	(Any 2)	(2)
	2.4.2	(a) FSH✓/follicle stimulating hormone <b>(Mark first ONE only)</b>		(1)
		(b) Oestrogen✓ <b>(Mark first ONE only)</b>		(1)
	2.4.3	- A zygote✓ is formed - which divides by mitosis✓ - forming a ball of cells✓ - called the morula✓ - which further divides to form a hollow ball of cells✓	(Any 4)	(4)
	2.4.4	- Progesterone levels would fall✓ - The endometrium would no longer be maintained✓ - A miscarriage would occur✓		(3) <b>(11)</b>
2.5	2.5.1	Metaphase I✓		(1)
	2.5.2	- Crossing over has taken place✓ - and genetic material was exchanged ✓		(2)
	2.5.3	Anaphase II✓		(1)
	2.5.4	- The spindle fibres contract✓ - The centromeres split✓ - and pull the daughter chromosomes✓/chromatids - to the opposite poles of the cells✓ - Cytokinesis begins✓	(Any 3)	(3)
	2.5.5	Testes✓/seminiferous tubules <b>(Mark first ONE only)</b>		(1) <b>(8)</b> <b>[40]</b>

**QUESTION 3**

- 3.1 3.1.1 (a) ADH✓/antidiuretic hormone (1)
- (b) Hypothalamus✓/Pituitary gland (1)
- (c) Kidneys✓ (1)
- 3.1.2 - An increase in ADH causes the walls of the kidney tubules✓  
- to become more permeable✓ to water  
- More water is reabsorbed✓  
- and the blood volume increases✓  
- Less urine is produced✓  
- and the urine is more concentrated✓ (Any 4) (4)  
(7)
- 3.2 3.2.1 Pancreas✓ (1)
- 3.2.2
- | Insulin A  | Insulin B   |
|--|---|
| Glucose uptake peaks at a higher level✓/around 7 mg/kg/min                           | Glucose uptake peaks at lower level✓/around 1 mg/kg/min                 |
| All glucose uptake occurs in a short period of time✓/the first 5 hours               | Glucose uptake is gradual✓/sustained over a period of 24 hours          |
| The initial uptake of glucose rises rapidly to a maximum within the first few hours✓ | The initial uptake of glucose rises slowly to the maximum over 5 hours✓ |
- TABULATION IS NOT REQUIRED (Any 2 x 2) (4)  
**(Mark first TWO only)** (5)
- 3.3 3.3.1 (a) Amount of thyroxin✓ (1)
- (b) Body weight✓ (1)
- 3.3.2 - Same number of rats in each group✓  
- All rats were of the same species✓  
- All groups were investigated for the same period of time✓  
- All rats were the same gender✓  
- All groups were weighed after the same interval✓ (Any 3) (3)  
**(Mark first THREE only)**
- 3.3.3 Group A✓ (1)
- 3.3.4 - Low thyroxin levels✓  
- will lead to low metabolic rate✓  
- Therefore the energy from the diet is used very slowly✓  
- and more organic compounds are stored✓ (Any 3) (3)
- 3.3.5 Group B✓ (1)
- 3.3.6 - These rats have high levels of thyroxin in their blood✓  
- therefore pituitary gland will not be stimulated✓ to secrete TSH (2)  
(12)



- 3.4 3.4.1 - Poor infrastructure✓  
- Climate change✓  
- Wastage✓  
- Pollution of water sources✓ (Any 2) (2)  
**(Mark first TWO only)**
- 3.4.2 - The need of water for irrigation will be reduced✓ (1)
- 3.4.3 - Decreased production✓  
- will lead to loss of profit✓ (2)
- 3.4.4 - More revenue for fixing poor infrastructure✓/building dams  
- Less water wastage✓by individuals and companies (2)  
**(Mark first TWO only) (7)**
- 3.5 3.5.1 (a)  
- Invasive alien plants reduce food security✓  
- since they grow rapidly and invade land✓  
- that could be used to grow crops✓ (3)
- (b)  
- Invasive alien plants reduce water availability✓  
- since they use more water✓ (2)
- 3.5.2 (a)  
- The new organism may become a pest itself✓/it may feed on indigenous plants instead of the targeted alien plant  
- since no natural enemy for it was brought into the area✓ (2)
- (b)  
- Some parts that are left behind✓  
- can regrow✓/will cost more money to remove them again (2)  
**(9)**  
**[40]**
- TOTAL SECTION B: 80**

**SECTION C****QUESTION 4**Plant stems response to unilateral light

- Plant stems response to light is positively phototropic✓
- Auxins✓
- produced in the tip of the stem✓
- move away from unilateral light✓
- so that there is a high concentration of auxins on the darker side✓
- which stimulates growth✓/cell division/cell elongation
- The low concentration of auxins on the side exposed to light✓
- inhibits growth✓
- This uneven growth✓
- causes the stem to bend towards the light✓

Max 7

How humans receive and interpret light stimuli

- Light enters the eye ✓
- through the cornea✓
- which refracts the light✓
- It then passes through the aqueous humour✓
- and the pupil✓
- The size of the pupil is adjusted by the iris✓
- to regulate the amount of light that enters the eye✓
- The light then passes through the lens✓
- which also refracts the light✓
- It then passes through the vitreous humour✓
- and reaches the retina✓
- which has the photoreceptors✓/rods and cones which convert the light stimulus into a nerve impulse

Max 10 (10)  
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/ cause-effect sequence	Answered all aspects required by the essay in sufficient detail
All the information provided is relevant to plant stems' response to unilateral light and how humans receive and interpret light stimuli.	All the information regarding how plant stems respond to unilateral light and how humans receive and interpret light stimuli are arranged in a logical manner.	At least the following points should be included: - Plant response to unilateral light (4/7) - How humans receive and interpret light stimuli (7/10)
No irrelevant information.		
1 mark	1 mark	1 mark

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