



# basic education

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

## **NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**LIFE SCIENCES P2  
VERSION 2 (OLD CONTENT) FOR PART-TIME CANDIDATES  
NOVEMBER 2012  
MEMORANDUM**

**MARKS: 150**

**This memorandum consists of 10 pages.**

**PRINCIPLES RELATED TO MARKING LIFE SCIENCES 2012**

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 part of it is required**  
Read all and credit relevant part.
4. **If comparisons are asked for and descriptions are given**  
Accept if 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 becomes correct again, resume credit.
9. **Non-recognized abbreviations**  
Accept if first defined in answer. If not defined, do not credit the unrecognised abbreviation but credit the rest of 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 recognizable, accept, provided it does not mean something else in Life Sciences or if it is out of context.
13. **If common names given in terminology**  
Accept, provided it was accepted at the National memo discussion meeting.

14. **If only letter is asked for and only name is given (and vice versa)**  
No credit.
15. **If units are not given in measurements**  
Memorandum will allocate marks for units separately, except where it is already given in the question.
16. Be sensitive to the **sense of an answer, which may be stated in a different way.**
17. **Caption**  
Credit will be given for captions to all illustrations (diagrams, graphs, tables, etc.) except where it is already given in the question.
18. **Code-switching of official languages (terms and concepts)**  
A single word or two that appears 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. No changes must be made to the marking memoranda. In exceptional cases, the Provincial Internal Moderator will consult with the National Internal Moderator (and the External moderators if necessary).
20. 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 in the training of markers and in the marking.

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

- |     |       |  |         |                    |
|-----|-------|--|---------|--------------------|
| 1.1 | 1.1.1 | A✓✓  |         |                    |
|     | 1.1.2 | C✓✓  |         |                    |
|     | 1.1.3 | D✓✓  |         |                    |
|     | 1.1.4 | A✓✓  |         |                    |
|     | 1.1.5 | B✓✓  |         |                    |
|     | 1.1.6 | A✓✓  |         |                    |
|     | 1.1.7 | A✓✓  | (7 x 2) | <b>(14)</b>        |
| 1.2 | 1.2.1 | Sustainable✓   |         |                    |
|     | 1.2.2 | Biogeography✓  |         |                    |
|     | 1.2.3 | Food web✓  |         |                    |
|     | 1.2.4 | Alien✓ species   |         |                    |
|     | 1.2.5 | Biodegradable✓   |         |                    |
|     | 1.2.6 | Abiotic✓ factors   |         | <b>(6)</b>         |
| 1.3 | 1.3.1 | Both A and B✓✓   |         |                    |
|     | 1.3.2 | B only✓✓   |         |                    |
|     | 1.3.3 | None✓✓   |         |                    |
|     | 1.3.4 | Both A and B✓✓   |         |                    |
|     | 1.3.5 | A only✓✓   |         |                    |
|     | 1.3.6 | A only✓✓   |         |                    |
|     | 1.3.7 | Both A and B✓✓   |         |                    |
|     | 1.3.8 | B only✓✓   | (8 x 2) | <b>(16)</b>        |
| 1.4 | 1.4.1 | Distance from outflow ✓ on the percentage of dissolved oxygen✓ and the number of certain organisms✓  |         | (3)                |
|     | 1.4.2 | (a) rat-tailed maggots✓/sludge worms   |         | (1)                |
|     |       | (b) water lice✓  |         | (1)                |
|     | 1.4.3 | As the distance from the sewage outflow increases✓ the percentage of dissolved oxygen also increases✓  |         | (2)                |
|     | 1.4.4 | - The size/volume of the water samples/ size of container must be the same<br>- The samples must be taken at the same depth<br>- Samples must be taken at the same time in all areas<br>- Use sterile/clean containers<br>- The samples areas must be comparable<br><b>(Mark first TWO only)</b> | (any)   | (2)                |
|     | 1.4.5 | Repeat the investigation✓<br>Increase the sample size✓   |         | (2)<br><b>(10)</b> |

- 1.5 1.5.1 (a) increase✓ (1)
- (b) decrease✓ (1)
- 1.5.2 The big fish population will die off/ decrease ✓ and therefore there will not be any food for the shark✓ (2)  
(4)

**TOTAL SECTION A: 50**

## SECTION B

### QUESTION 2

- 2.1 2.1.1 Table mountain trace fossils✓ (1)
- 2.1.2 Jurassic✓ (1)
- 2.1.3 It would indicate that complex organisms✓ did not evolve from simple organisms✓ therefore the theory will be rejected✓  
OR  
It would mean the simple organisms co-existed✓ with hominids✓ therefore complex organisms did not evolve from simple organisms✓  
OR  
Humans evolved before✓ we currently believe✓ need to rethink human evolution✓  
any (3)
- 2.1.4 Silurian✓ (1)
- 2.1.5 - Formation of large clouds of dust✓  
- blocking out the sun✓  
- causing global cooling✓  
- which stopped photosynthesis✓  
- with no producers in food chains✓  
- food chains involving dinosaurs were destroyed✓ any (5)  
(11)
- 2.2 2.2.1 Starvation resistance time (hours)✓ (1)
- 2.2.2 Temperature in the containers✓  
Flies from the same generation✓/age  
Flies of the same species✓  
Same/amount food given✓  
Number of eggs used ✓ any (2)

- 2.2.3 As a result of genetic variation ✓ in the fruit flies population some fruit flies had longer starvation resistance time ✓ and others not. When there was no food the fruit flies with shorter starvation resistance ✓ did not survive ✓  
The fruit flies with longer starvation resistance time survived ✓ and reproduce ✓ offspring with longer resistance time  
Genes ✓ /genotype for the favourable trait were passed on to subsequent generations. any (5)  
(8)
- 2.3 2.3.1 39 ✓ millions years ✓ /my (2)
- 2.3.2 They could see further away ✓ to see predators at a distance ✓ (2)
- 2.3.3 4 ✓ times (1)
- 2.3.4 - All horses had toes originally ✓  
- Horses did not use the toes frequently ✓  
- when the environment changed ✓ from swamps to grasslands □  
- the toes disappeared ✓ /fused  
- The fused toes acquired ✓ in this way  
- could be passed on to the next generation ✓ /were inherited any (4)  
(4)
- 2.3.5 There is no evidence ✓ that acquired characteristics are inherited ✓ (2)  
(11)  
[30]

**QUESTION 3**

- 3.1 3.1.1 -\***Allopatric** ✓ speciation  
- There is variation in a population ✓  
-\***Populations were separated by a geographical barrier** ✓  
- Each group undergoes natural selection independently ✓ and develops differently ✓  
- Genotypically ✓ and phenotypically ✓  
- Gene flow ✓ /reproduction between the different populations does not occur  
- The differences that develop between the different populations prevent them from inter-breeding ✓ even if they were to mix  
- Such that each group becomes a new species ✓  
Max 6 +2\* (compulsory marks) (8)

## 3.2 3.2.1

CHARACTERISTIC	ORGANISM A	ORGANISM B
Jaw	1✓	2 ✓
Skull	2✓	1✓
Pelvis	2✓	1✓
Foot	1✓	2✓

OR

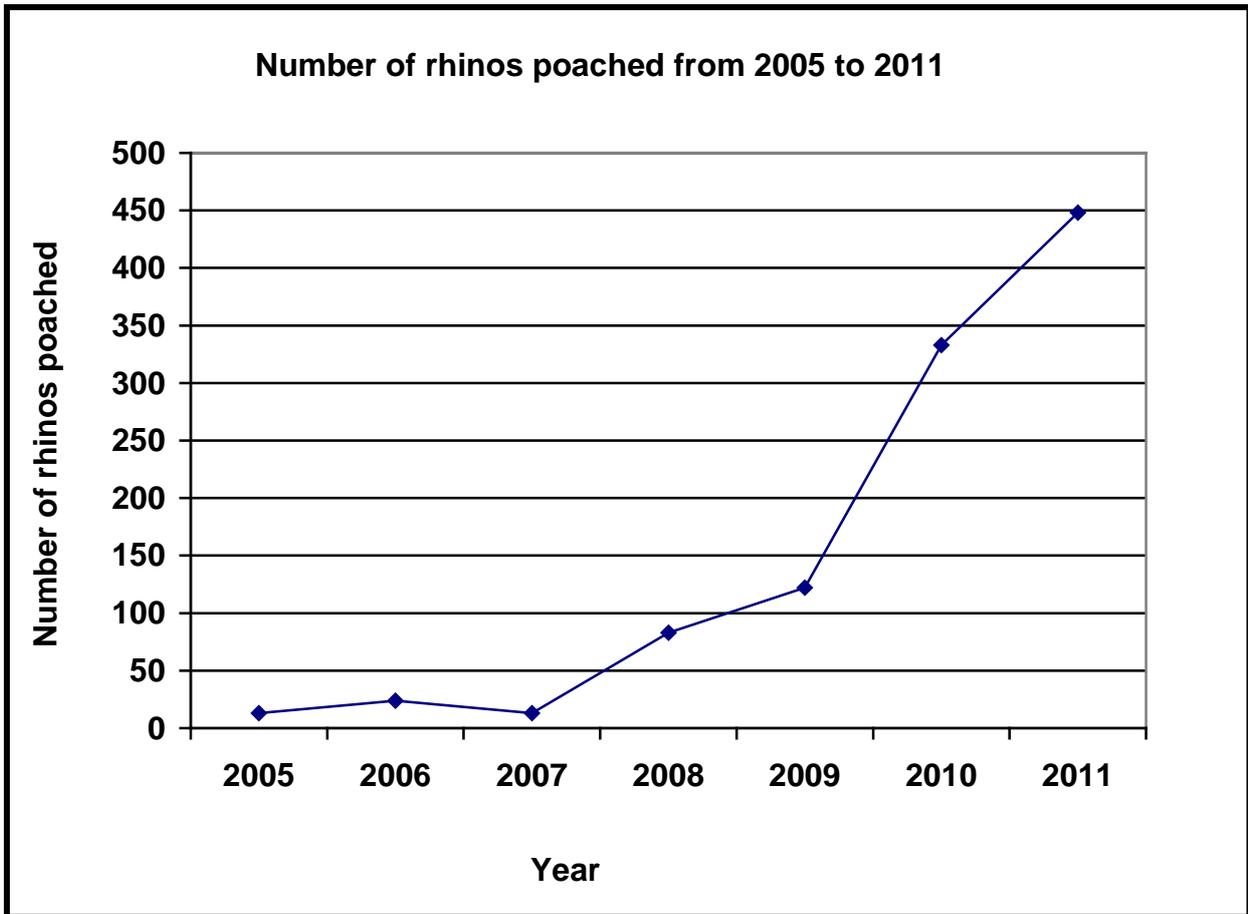
CHARACTERISTIC	ORGANISM B	ORGANISM A
Jaw	1✓	2 ✓
Skull	2✓	1✓
Pelvis	2✓	1✓
Foot	1✓	2✓

			(8)
3.2.2	2✓		(1)
3.2.3	Foramen magnum✓		(1)
3.2.4	The position has shifted forward ✓ to support the skull ✓ in bipedalism✓ /upright posture		(3)
			<b>(13)</b>
3.3	3.3.1	(a) diagrams 1 and 3✓	(1)
		(b) diagrams 2 and 3✓	(1)
	3.3.2	They have different basic plan✓/insects wings part of exoskeleton and mole limb is part of endoskeleton indicating different origin✓	(2)
	3.3.3	(a) diagram 4 ✓	(1)
		(b) the structures that are reduced ✓ and have no known function in an organism✓	(2)
		(c) other organisms have similar structures✓ indicating common ancestry✓	(2)
			<b>(9)</b>
			<b>[30]</b>
		<b>TOTAL SECTION B:</b>	<b>60</b>

**SECTION C****QUESTION 4**

- 4.1 4.1.1 Secondary consumers e.g. birds can eat the pests with the poison✓, which can kill the birds✓ thereby decreasing the population size of birds
- OR
- The pests can go extinct✓, and the population size secondary consumer feeding on the pest will also decrease✓
- OR
- If any one level of the food chain is destroyed✓ there would be an imbalance✓ in all other levels.
- any (2 x 1) (2)
- 4.1.2
- Nitrogen-rich compounds in fertilizers✓
  - Causes an overgrowth of algae✓/algal bloom
  - This leads to the decrease in the amount of light coming in water✓ /decreases the rate of photosynthesis
  - As a result plants start to die✓
  - Increasing the amount of bacteria✓ that decomposes these plants
  - This leads to a decrease in the amount of oxygen✓ as it is used up by the bacteria
  - Other aquatic organisms also die✓ due to lack of oxygen✓
- any (5)  
(7)
- 4.2
- Introduce legislation✓ to control air pollution
  - Monitor emissions from industries✓ to ensure that legislation is being followed
  - Impose heavy fines ✓ to discourage repeated acts of pollution
  - Provide incentives to companies✓ / subsidize the purchase and use of clean energy to encourage them to reduce air pollution✓
  - Educate✓ people about the ill effects of air pollution
  - Research new technologies✓ to find more efficient methods of energy production without releasing greenhouse gases for example solar panels, wind turbines
  - Increase the use of or improve public transport✓ / more fuel efficient cars/bicycles so that less fuel is burnt
  - Increasing the efficiency of electricity use✓ at home/industries which will decrease the amount of coal burnt in electricity production
  - Switch from fuels that produce a lot of greenhouse gases (coal) to those that produce less ✓ (natural gas) as alternative energy source
  - Preventing deforestation✓ / loss of other functioning ecosystems will prevent carbon stored in vegetation of being released in the environment
  - Restoring forest✓ / wetlands/other ecosystems will remove carbon dioxide from the air because plants absorb carbon dioxide
- (Mark first THREE only)**
- any (3)

4.3 4.3.1



**Rubric for the mark allocation of the graph**

Correct type of graph	1
Title of graph	1
Correct label for X-axis	1
Correct label for Y-axis	1
Appropriate scale for X-axis	1
Appropriate scale for Y-axis	1
Drawing of the graphs	1: 1 to 3 points plotted correctly 2: 4 to 6 points plotted correctly 3: all 7 points plotted accurately

(9)

**NOTE:**

**If the wrong type of graph is drawn: marks will be lost for**

- correct type of graph - 1 mark

**If labels of the axes are transposed then marks will be lost for:**

- correct labels for axes – 2 marks

- 4.3.2 37,3✓ (1)
- 4.3.3  $181/4✓ = 45,25 \times 8✓ = 362✓$  (3)
- 4.3.4 Making ornaments✓  
Medicinal use✓  
Aphrodisiac✓/sexual stimulant **(Mark first TWO only)** (2)  
**(15)**

#### 4.4 Possible answers

##### Reason against the use of the method

The barium may affect the end user (consumer)✓ – who is innocent✓  
May have unknown side effects✓ – may lead to more deaths✓  
Trauma against elderly animals on being subjected to tranquilizers✓ – lead to death✓

Not enough research has been done✓ – side effects may develop✓  
any (3 x 2) (6)

##### Reasons for the use of the method

People might be afraid to use the injected horns✓ – reducing demand✓  
The dye in the horn makes them useless as ornaments ✓– reducing demand✓  
The scanners at the airport/shipping/exiting SA at customs will pick up the rhino horns✓- faster transportation of horns stopped✓  
More poachers will be caught at the exit points✓ – thereby reducing the need for smuggling✓

(3 x 2) (6)  
**(12)**

#### ASSESSING THE PRESENTATION OF THE ESSAY

Marks	Description
3	Well structured- demonstrate insight and understanding of question
2	Minor gaps or irrelevant information in the logic and flow of the answers
1	Attempted but with significant gaps and irrelevant information in the logic and flow of the answers
0	Not attempted/nothing written other than question number/no correct information

**Synthesis** (3)  
**(15)**

**TOTAL SECTION C: 40**  
**GRAND TOTAL: 150**