



# basic education

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

## **NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**LIFE SCIENCES P1**

**NOVEMBER 2014**

**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 part of it is required**  
Read all and credit relevant part.
4. **If comparisons are asked for but 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 is 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. Indicate that the candidate's numbering is wrong.
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 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 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. **Changes to the memorandum**  
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. **Official memorandum**  
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  | A✓✓                               |          |             |
|     | 1.1.2  | B✓✓                               |          |             |
|     | 1.1.3  | A✓✓                               |          |             |
|     | 1.1.4  | D✓✓                               |          |             |
|     | 1.1.5  | C✓✓                               |          |             |
|     | 1.1.6  | A✓✓                               |          |             |
|     | 1.1.7  | C✓✓                               |          |             |
|     | 1.1.8  | D✓✓                               |          |             |
|     | 1.1.9  | C✓✓                               |          |             |
|     | 1.1.10 | B✓✓                               | (10 x 2) | <b>(20)</b> |
| 1.2 | 1.2.1  | Meninges✓                         |          |             |
|     | 1.2.2  | Gibberellin✓                      |          |             |
|     | 1.2.3  | Peripheral ✓ nervous system       |          |             |
|     | 1.2.4  | Parasympathetic✓ system           |          |             |
|     | 1.2.5  | Chorion✓                          |          |             |
|     | 1.2.6  | Aldosterone✓                      |          |             |
|     | 1.2.7  | Umbilical vein✓                   |          |             |
|     | 1.2.8  | TSH✓ /thyroid stimulating hormone |          |             |
|     | 1.2.9  | Gestation✓                        |          |             |
|     | 1.2.10 | Acrosome✓                         |          | <b>(10)</b> |
| 1.3 | 1.3.1  | A only✓✓                          |          |             |
|     | 1.3.2  | B only✓✓                          |          |             |
|     | 1.3.3  | None✓✓                            |          |             |
|     | 1.3.4  | B only✓✓                          |          |             |
|     | 1.3.5  | Both A and B✓✓                    | (5 x 2)  | <b>(10)</b> |
| 1.4 | 1.4.1  | A✓ - Iris✓                        |          | (2)         |
|     | 1.4.2  | C✓ - Choroid✓                     |          | (2)         |
|     | 1.4.3  | E✓ - Optic nerve✓                 |          | (2)         |
|     | 1.4.4  | D✓ - Fovea✓/yellow spot           |          | (2)         |
|     | 1.4.5  | B✓ - Cornea✓                      |          | (2)         |
|     |        |                                   |          | <b>(10)</b> |

**TOTAL SECTION A: 50**

## SECTION B

### QUESTION 2

- 2.1 2.1.1 A - Urethra✓  
B - Vas deferens✓/sperm duct  
F - Fallopian tube✓/oviduct (3)
- 2.1.2 (a) - Protects the sperm cell against the acidic environment of the vagina✓  
- Increases the motility of the sperm✓  
- Provides nutrients✓  
**(Mark first ONE only)** Any (1)
- (b) - Place for foetus to develop ✓  
- Maintain pregnancy✓  
- Assist in childbirth✓  
- Implantation✓ of blastula  
- Protects the foetus✓/prevents infections(mucus plug forms by cervix)  
- Passage for sperm cells✓between vagina and fallopian tubes  
**(Mark first ONE only)** Any (1)
- 2.1.3 (a) D✓ (1)  
(b) G✓ (1)
- 2.1.4 (a) Spermatogenesis✓ (1)  
(b) Oogenesis✓ (1)
- 2.1.5 - Serves as a birth canal✓  
- Allows for passage of blood/ endometrial lining/amniotic fluid/placenta  
- Facilitates sexual intercourse ✓/receives semen  
- Secretes acid which prevents infections✓  
**(Mark first TWO only)** Any (2)
- 2.1.6 - To keep the testes at a temperature that is lower than body temperature✓/optimum temperature for sperm production  
- which is necessary for the production of healthy sperm✓/so that healthy sperms can survive (2)  
**(13)**
- 2.2 2.2.1 FSH✓  
**OR**  
Oestrogen✓  
**(Mark first ONE only)** Any (1)
- 2.2.2 -The follicle✓develops✓ during this period stimulated by increased levels of FSH  
-The lining of the endometrium✓ thickens✓ during this period stimulated by increased levels of oestrogen  
**(Mark first ONE only)** Any(1 x 2) (2)

- 2.2.3 - Corpus luteum has not disintegrated✓  
- it continues to secrete progesterone✓  
- so the endometrial lining remains thickened✓ (3)
- 2.2.4 - The zygote✓  
- undergoes mitosis✓  
- until a ball of cells is formed✓  
- called a morula✓  
- The morula continues to divide and forms a mass of cells with a hollow cavity✓  
- called a blastocyst✓  
- the outer membrane of the blastocyst forms chorionic villi✓/  
attachment villi  
- which attaches it to the endometrium✓ Any (5)
- 2.2.5 (a) For family planning✓/ to know when they can get pregnant (1)
- (b) LH✓/FSH/oestrogen  
- There is a rise in levels✓ of LH/FSH/oestrogen  
- around the time of ovulation✓ (3)
- (15)**
- 2.3 2.3.1 (a) A and B✓ (1)
- (b) A and C✓ (1)
- 2.3.2 - To ensure that the results are attributed to gravity✓  
- and not light✓/ to eliminate the effect of light (2)
- 2.3.3 B – No growth will be observed✓  
C – Roots will grow **horizontally**✓/not change direction (2)
- 2.3.4 - Auxins will move to the lower side of the root✓/attracted by gravity  
- and a high concentration will inhibit growth on the lower side of the roots✓  
- while growth will occur faster on the upper side of the root✓  
- causing the root to bend downwards✓ Any (3)
- 2.3.5 - Used same type of plant✓/pea only  
- Seedlings were the same age✓/germination period was 7 days  
- All groups were exposed to the same environment✓/light intensity/ placed in dark cupboard  
- Same number of seedlings for each group✓  
- Root tips were cut at the same length✓  
- All seedlings placed in same position✓/horizontally  
- Allowed same amount of time for the 3 groups✓  
- Appropriate controls were set up✓ Any (3)
- (Mark first THREE only)** **(12)**
- [40]**

### QUESTION 3

- 3.1 3.1.1 Number of kilograms of wheat per hectare✓/Yield (1)
- 3.1.2 To compare✓the yield obtained when using two types of fertiliser with the yield of the hectare with no fertiliser✓  
**OR**  
It acts as a control✓ - to ensure that the results obtained are due to the addition of fertilisers✓ and not any other factor  
Any(1x2) (2)
- 3.1.3 - She could have increased the sample size✓/number of plots/ number of plants for each type of fertiliser used  
- Repeated the investigation✓  
**(Mark first ONE only)** Any (1)
- 3.1.4 - Depletes nutrients in the soil✓  
- Leads to decrease in yield✓  
- Increases pests✓  
- Leads to soil erosion✓  
- Decreases biodiversity✓  
**(Mark first THREE only)** Any (3)
- 3.1.5 - The excessive use of fertilisers increases the nutrient content✓of the surrounding river /eutrophication occurs/ water becomes polluted  
- This causes an increase in algal growth✓ /algal bloom  
- The algae block out light✓  
- reducing photosynthesis✓  
- Plants and animals depending on them die✓  
- increasing decomposition✓  
- leading to a depletion of oxygen✓  
- and reducing the biodiversity✓/reducing the number of animal and plant species in the river  
Any (4)  
**(11)**
- 3.2 3.2.1 (a) - Carbon footprint is a measure of the total amount of greenhouse gas emissions✓/(example of greenhouse gas)  
- of an individual✓ /defined population/ company per year (2)
- (b) - Food security refers to the availability and access✓  
- to adequate, safe and nutritious food✓ to people at all times✓  
Any (2)
- 3.2.2 - Energy used to produce and transport wasted food is lost✓  
- The fossil fuels used in production and transport of wasted food✓  
- and the decomposition of wasted food✓  
- releases greenhouses gases ✓/examples of greenhouse gases  
- leading to the enhanced greenhouse effect✓  
which eventually leads to global warming (4)

|                              |  |  |                     |
|------------------------------|--|--|---------------------|
| 3.2.3                        | <ul style="list-style-type: none"> <li>- Buy only what is needed in sufficient quantities✓</li> <li>- Give to others what is not used instead of throwing away✓</li> <li>- Educate about efficient farming methods✓</li> <li>- Educate about ways to preserve food✓</li> <li>- Improve storage facilities✓</li> <li>- Improve the shelf-life of food✓</li> </ul> | Any  | (2)<br>(10)         |
| <b>(Mark first TWO only)</b> |  |  |                     |
| 3.3                          | 3.3.1  | Constricted✓   | (1)                 |
|                              | 3.3.2  | <ul style="list-style-type: none"> <li>- Less blood flows✓ to the skin</li> <li>- so less heat is lost to the environment✓ by radiation</li> <li>- Less sweat is formed✓ because less blood flows to the sweat glands</li> <li>- therefore less evaporation✓ of sweat</li> <li>- and hence less cooling✓ of the skin</li> <li>- Body heat is conserved✓</li> </ul>   | Any (4)             |
|                              | 3.3.3  | <ul style="list-style-type: none"> <li>- Hypothalamus is stimulated✓</li> <li>- sends message to the blood vessels of the skin to dilate✓/ vasodilation occurs</li> <li>- More blood flows✓ to the surface of the skin</li> <li>- More heat is lost by radiation✓ from the skin surface</li> <li>- More sweat is formed✓ because more blood flows to the sweat glands</li> <li>- and therefore more heat is lost by increased evaporation✓ of sweat</li> </ul> | Any (4)<br>(9)      |
| 3.4                          | 3.4.1  | <ul style="list-style-type: none"> <li>- The blood glucagon levels increase✓/from 100 to 210 (picograms/ml)</li> <li>- from 0 to 20 min✓</li> <li>- and become constant✓ thereafter</li> </ul>   | (3)                 |
|                              | 3.4.2  | <ul style="list-style-type: none"> <li>- during exercise more energy is needed✓</li> <li>- therefore the rate of cellular respiration increased✓</li> <li>- Increased cellular respiration requires more glucose✓</li> <li>- hence more glucagon is secreted✓</li> <li>- to stimulate the conversion of glycogen to glucose✓</li> </ul>  | Any (3)             |
|                              | 3.4.3  | Decrease✓  | (1)                 |
|                              | 3.4.4  | <ul style="list-style-type: none"> <li>- The lack of insulin✓/defective insulin</li> <li>- decreases the conversion✓</li> <li>- of glucose to glycogen✓</li> </ul>   | (3)<br>(10)<br>[40] |



## SECTION C

### QUESTION 4

As the ball moved towards the goalkeeper:

- Accommodation✓ took place
- Ciliary muscles contracted✓
- Suspensory ligaments became slack✓
- This reduced the tension on lens✓
- Lens became more convex✓/round
- Refractive power of the lens increased✓
- Image of the ball fell on the retina✓

Any (5)

#### Hearing

The shout of his team-mate was heard by the goal keeper as follows:

- The sound waves were directed by the pinna✓
- through the auditory canal✓
- to the tympanic membrane✓/eardrum
- causing it to vibrate✓
- The vibrations of the tympanic membrane were transferred to the ossicles✓ in the middle ear
- which eventually caused the oval window to vibrate✓
- This set up pressure waves in the cochlea✓
- This stimulated the Organ of Corti✓ in the cochlea
- to convert this stimulus into a nerve impulse✓
- which was then transmitted along the auditory nerve✓
- and interpreted in the cerebrum✓

Any (7)

#### Balance and equilibrium

As he dived:

- A change in the direction and speed✓ of the body
- causes the movement of fluid in the semicircular canals✓
- which stimulates the cristae✓
- A change in the position of the head✓
- stimulated the maculae✓ in the utricle and saccule
- The stimuli were converted into impulses✓
- which were transported along the auditory nerve✓
- and interpreted in the cerebellum✓
- which then sent impulses to the muscles✓
- to restore balance and equilibrium✓

Any (5)  
Content (17)  
Synthesis (3)

**ASSESSING THE PRESENTATION OF THE ESSAY**

| <b>Relevance</b>  | <b>Logical sequence</b>   | <b>Comprehensive</b>  |
|---|---|---|
| All information provided is relevant to the topic   | Ideas arranged in a logical/ cause-effect sequence                              | Answered all aspects required by the essay  |
| Only information relating to accommodation, hearing and balance & equilibrium is included. (There is no irrelevant information) | Logical sequence of events in accommodation, hearing and balance & equilibrium. | Includes sufficient information on all 3 processes, i.e. accommodation( <b>min 3/5</b> ), hearing( <b>min 4/7</b> ) and balance & equilibrium( <b>min 3/5</b> ) |
| 1 mark  | 1 mark  | 1 mark  |

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