



# basic education

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

## **NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**LIFE SCIENCES P2**

**VERSION 1 (NEW CONTENT) FOR FULL-TIME CANDIDATES**

**FEBRUARY/MARCH 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 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 unrecognized 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**  
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 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 without consulting the Provincial Internal Moderator who in turn will consult with the national Internal Moderator (and the External moderators where 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 during training and during the marking period.

## SECTION A

### QUESTION 1

- |     |        |                                  |          |             |
|-----|--------|----------------------------------|----------|-------------|
| 1.1 | 1.1.1  | B✓✓                              |          |             |
|     | 1.1.2  | C✓✓                              |          |             |
|     | 1.1.3  | B✓✓                              |          |             |
|     | 1.1.4  | B✓✓                              |          |             |
|     | 1.1.5  | B✓✓                              |          |             |
|     | 1.1.6  | D✓✓                              |          |             |
|     | 1.1.7  | D✓✓                              |          |             |
|     | 1.1.8  | B ✓✓                             |          |             |
|     | 1.1.9  | C✓✓                              | (9 x 2)  | <b>(18)</b> |
| 1.2 | 1.2.1  | Metamorphosis✓                   |          |             |
|     | 1.2.2  | Semen✓                           |          |             |
|     | 1.2.3  | Carrying capacity✓               |          |             |
|     | 1.2.4  | Mutualism✓                       |          |             |
|     | 1.2.5  | Resource/niche partitioning✓     |          |             |
|     | 1.2.6  | Biodiversity✓                    |          |             |
|     | 1.2.7  | Competitive exclusion✓ principle |          |             |
|     | 1.2.8  | Culling✓                         |          |             |
|     | 1.2.9  | Migration✓                       |          |             |
|     | 1.2.10 | Species✓                         | (10 x 1) | <b>(10)</b> |
| 1.3 | 1.3.1  | None✓✓                           |          |             |
|     | 1.3.2  | B only✓✓                         |          |             |
|     | 1.3.3  | A only✓✓                         |          |             |
|     | 1.3.4  | None✓✓                           |          |             |
|     | 1.3.5  | B only✓✓                         |          |             |
|     | 1.3.6  | A only✓✓                         |          |             |
|     | 1.3.7  | A only✓✓                         |          |             |
|     | 1.3.8  | B only✓✓                         | (8 x 2)  | <b>(16)</b> |
| 1.4 | 1.4.1  | Ovary ✓                          |          |             |
|     | 1.4.2  | Ovum ✓/egg                       |          |             |
|     | 1.4.3  | Zygote✓                          |          |             |
|     | 1.4.4  | Sperm cell✓/tail of sperm cell   |          |             |
|     | 1.4.5  | Umbilical cord✓                  |          |             |
|     | 1.4.6  | Amniotic✓                        |          | <b>(6)</b>  |

**TOTAL SECTION A: 50**

## SECTION B

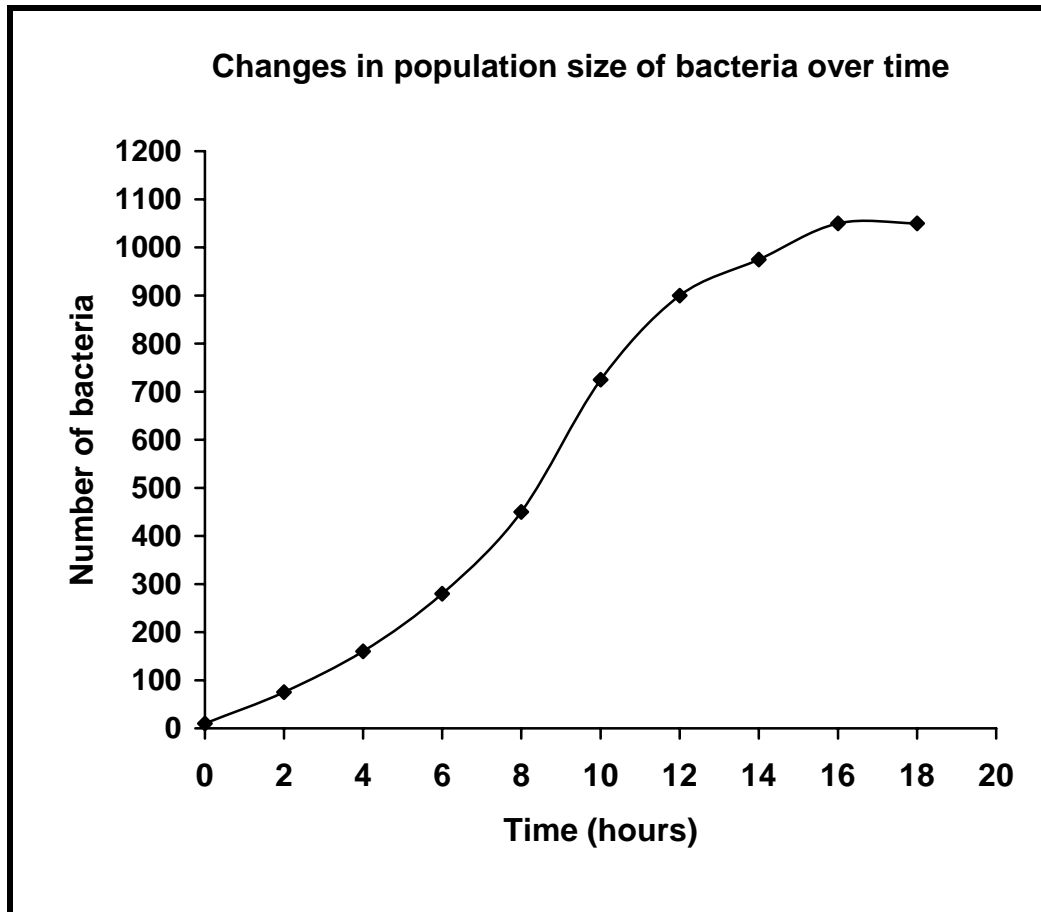
### QUESTION 2

- |     |       |   |                             |
|-----|-------|---|-----------------------------|
| 2.1 | 2.1.1 | 2 – cornea✓<br>3 – lens ✓<br>4 – suspensory ligaments ✓<br>5 – ciliary muscles✓/body  | (4)                         |
|     | 2.1.2 | Pupillary mechanism ✓/Pupil reflex<br><br>The radial muscles ✓ of the iris contracts ✓ and the circular muscles ✓ relax✓<br>The pupil ✓ dilates and more light enters the eye✓  | (1)<br><br>(Any 5) (5)      |
|     | 2.1.3 | (a) Wear spectacles with convex ✓ lenses/use contact convex lenses/using lasers during surgery to reshape the cornea<br><br>(b) Wear spectacles with lenses which are unevenly ground✓ to compensate for the uneven cornea/lens/surgery<br><br>(c) Cataracts surgically✓ removed/lens replacement<br><br>(d) Wear spectacles with concave ✓ lenses/use contact concave lenses/using lasers during surgery to reshape the cornea | (4)<br><br><br><br><br>(14) |
| 2.2 | 2.2.1 | Interneuron✓/connector neuron/association neuron  | (1)                         |
|     | 2.2.2 | Motor neuron ✓  | (1)                         |
|     | 2.2.3 | The person will become aware of the stimulus✓ but the motor neuron will not be able ✓ to transmit the impulse from the interneuron✓ to the effector organ ✓/<br>muscles and movement will not take place✓/ reaction will not occur<br>(Max 3)   | (3)                         |
|     | 2.2.4 | Helps to protect the body ✓ by reacting quickly ✓<br>The interneuron makes a short cut ✓ /not going to the brain/<br>uses a reflex pathway that is immediately available  | (Max 2) (2)<br>(7)          |

- |     |       |   |             |
|-----|-------|---|-------------|
| 2.3 | 2.3.1 | (a) Corpus luteum✓<br>(b) Placenta✓   | (2)         |
|     | 2.3.2 | (a) Hypophysis✓/Pituitary gland<br>(b) Stimulates mammary glands to produce milk✓                 | (2)         |
|     | 2.3.3 | There is no need to maintain endometrium any longer✓ – allows the placenta removal as afterbirth✓ | (2)         |
|     | 2.3.4 | Uterine wall will disintegrate✓ – miscarriage occurs✓/implantation would not occur                | (2)         |
|     | 2.3.5 | Brings about contractions✓ of the uterus during labour/stimulates milk production                 | (1)         |
|     |       |   | <b>(9)</b>  |
|     |       |   | <b>[30]</b> |

### QUESTION 3

3.1 3.1.1



#### Guideline for the assessing the graph

Correct type of graph	1
Title of graph	1
Correct label x-axis	1
Correct scale x-axis	1
Correct label y-axis	1
Correct scale y-axis	1
Plotting of points	1: 1 to 4 points plotted correctly 2: 5 to 8 points plotted correctly 3: All 10 points plotted correctly

(9)

#### NOTE:

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

- 'Correct type of graph'
- 'Plotting '

- 3.1.2 (a) The population of bacteria shows a rapid increase in numbers✓ because there are very few limiting factors✓ e.g. plenty of food, space available/less competition (2)
- (b) Population numbers remains constant✓ because food supply and other resources are limited✓/environmental resistance began operating. (2)
- 3.1.3 Growth would be faster in the lag phase✓ and exponential phase✓ and the stationary phase would be reached earlier✓ than 18 hours. (3)
- 3.2 3.2.1  $P = \frac{F \times S}{M}$  (16)
- $= \frac{20 \times 25}{8} \checkmark = 62,5 \checkmark$  (3)
- 3.2.2 - Cutting off a portion of tail fin would have affected the ability of the fish to swim✓ causing fish to die✓  
- Cutting off a portion of tail fin prevents movement✓thus preventing mixing✓ of marked and unmarked fish  
(Mark first ONE only) (Any 1 x 2) (2)
- 3.2.3 Do a number of second catches ✓ apply the formula each time and then take an average✓ to get more reliable estimate of the number of fish in the dam (2)
- (7)
- 3.3 3.3.1 Country C✓ (1)
- 3.3.2 Country B✓ (1)
- 3.3.3 Shows an increasing birth rate✓ compared to the other two countries (1)
- Death rate is still higher✓ than the other two countries (1)
- (Mark first ONE only) (Any 1) (1)
- 3.3.4 - Improvement in water supply✓/sewage treatment/hygienic food handling /and general standards of cleanliness – have eradicated many disease✓ such as typhoid fever, amoebic dysentery resulting in decreased death rate  
- Mass immunisations✓ against polio, measles, small pox, mumps decreased the incidence of disease✓  
- Discovery of antibiotics ✓has now made it possible to treat most diseases caused by bacteria ✓e.g. TB that used to kill many people in the past  
- Agriculture has become more efficient✓/production of more food preventing starvation ✓/death in many countries  
- Improved medical care✓therefore fewer deaths due to illness✓  
- Focus on lifestyle change✓/exercising /healthy living therefore fewer deaths due to diabetes etc✓  
(Mark first TWO only) (Any 2 x 2) (4)
- (7)
- [30]

**TOTAL SECTION B: 60**



## SECTION C

### QUESTION 4

- 4.1 4.1.1 Higher/Lower percentage✓ of seeds will germinate ✓ in gibberellin solution/water✓ than in water/gibberellin solution  
**OR**  
Same percentage of seeds✓ will germinate✓ in gibberellin solution and in water✓ (3)
- 4.1.2 Accept any value between 77 to 78% ✓ (1)
- 4.1.3 Water serves as a control✓ to verify that gibberellin does have an effect on germination ✓/to compare results (2)
- 4.1.4 -The number of hazelnut seeds in both sets must be the same✓  
- Same volume of gibberellin solution and water must be used✓  
- Use seeds from the same plant✓  
- Maintain the same environmental conditions✓  
**(Mark first TWO only)** (2)
- 4.1.5 Water is available✓ for the seeds to germinate✓ and grow after the heavy rain (2)  
**(10)**
- 4.2 4.2.1 1 – pituitary ✓ gland  
4 – adrenal ✓ gland (2)
- 4.2.2 (a) 3✓  
(b) 1✓  
(c) 2✓  
(d) 4✓ (4)
- 4.2.3 They respond to internal and/or external stimuli✓  
They protect organisms✓ (2)  
**(Mark first TWO only)**
- 4.2.4 Hormones: Responses are slow processes✓/may affect multiple sites  
Nerves: Responses are quick reactions✓/affect localised sites (2)  
**(10)**

4.3 Possible answer

**Hypothalamus**

- The change in temperature is detected✓ by the thermo-receptors ✓in the skin
- Stimulus converted to nerve impulse✓
- Transmitted to the hypothalamus ✓
- Hypothalamus sends impulses to the muscle layer in the arterioles ✓of the skin (Max 3) (3)

- **On a cold day** the arterioles close to the surface constrict✓/vaso-constriction occurs
- Less blood✓ flows to capillaries close to the surface
- Sweat production decreases✓ / less sweat is lost
- less heat is radiated from the body✓/less heat is lost (4)

- **On a hot day** the arterioles close to the surface dilate✓/ vaso-dilation occurs
- More blood✓ flows to the capillaries close to the surface
- Sweat production increases✓/ more sweat is lost
- More heat is radiated✓ from the body/more heat is lost (4)

**Adrenal gland**

- Secretes adrenalin✓
  - Hormone that prepares the body to cope with emergency✓/danger /stress situations
  - Adrenalin causes the blood vessels of the skin to constrict✓
  - Less blood flows to the surface of the skin✓
  - Because the skin is not an important organ during an emergency✓
  - Re-directing more blood /more oxygen and food to vital organs✓
  - To enable the body to respond during an emergency✓ (Max 6) (6)
- (17)**

**ASSESSING THE PRESENTATION OF THE ESSAY**

Marks	Descriptions
<b>3</b>	Well structured – demonstrates insight and understanding of question
<b>2</b>	Minor gaps in the logic and flow of the answer
<b>1</b>	Attempted but with significant gaps in the logic and flow of the answer
<b>0</b>	Not attempted/nothing written other than question number

**Synthesis (3)  
(20)**

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