



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES P1
VERSION 2 (OLD CONTENT) FOR PART-TIME CANDIDATES
FEBRUARY/MARCH 2013
MEMORANDUM

MARKS: 150

This memorandum consists of 10 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES 2013

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 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 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, 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.).
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 Moderator 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 | B✓✓ | | |
| | 1.1.2 | D✓✓ | | |
| | 1.1.3 | D✓✓ | | |
| | 1.1.4 | A✓✓ | | |
| | 1.1.5 | C✓✓ | | |
| | 1.1.6 | B✓✓ | (6 x 2) | (12) |
| 1.2 | 1.2.1 | Albinism✓ | | |
| | 1.2.2 | (DNA) Replication ✓ | | |
| | 1.2.3 | Fallopian (tube)✓/oviduct | | |
| | 1.2.4 | Homologous✓ | | |
| | 1.2.5 | Homozygous✓ | | |
| | 1.2.6 | Karyotype✓ | | |
| | 1.2.7 | Phenotype✓ | | |
| | 1.2.8 | Recessive✓ | | (8) |
| 1.3 | 1.3.1 | Both A & B✓✓/A & B | | |
| | 1.3.2 | Both A & B✓✓/A & B | | |
| | 1.3.3 | A only✓✓/A | | |
| | 1.3.4 | A only✓✓/A | | |
| | 1.3.5 | None✓✓ | | |
| | 1.3.6 | B only✓✓/B | | |
| | 1.3.7 | A only✓✓/A | (7 x 2) | (14) |
| 1.4 | (a) | Down syndrome✓ | | (1) |
| | (b) | Mental retardation✓/short and broad hands/slanting eyes/big tongue/
abnormal ears/congenital heart disease | (any 2) | (2) |
| | (c) | Blood fails to clot✓/extreme bleeding | | (1) |
| | (d) | Sickle cell anaemia✓ | | (1) |
| | (e) | Gene mutation✓/point mutation/recessive allele | | (1) |
| | | | | (6) |
| 1.5 | 1.5.1 | Female✓ brown hair✓ | | (2) |
| | 1.5.2 | (a) Bb✓ | | (1) |
| | | (b) Bb✓ | | (1) |
| | | (c) bb✓ | | (1) |
| | 1.5.3 | (a) None✓ | | (1) |
| | | (b) 4✓ | | (1) |
| | 1.5.4 | (a) 50%✓ | | (1) |
| | | (b) 75%✓✓ | | (2) |
| | | | | (10) |

TOTAL SECTION A: 50

- (b)
- Take away individual rights to make their medical condition public knowledge✓
 - Information can be misused, e.g. by employers to exclude HIV positive people✓
 - Can be stigmatised ✓/discriminated against
 - Increased suicide rate✓
 - The cost of testing could be unaffordable to the government✓/individual
 - Logistical difficulties relating to implementation and frequency of testing✓

(Mark first THREE answers only)

(3)

$$2.3.5 \quad \frac{(5,9 \times 2348)}{100} + \frac{(6,1 \times 2099)}{100} + \frac{(14,1 \times 3981)}{100} = 827,8✓$$

$$X = \frac{827,8 \times 100}{8428}✓$$

$$= 9,82✓ \text{ (Accept 9,81 to 9,83)}$$

(3)

(12)

[30]

QUESTION 3

3.1 3.1.1 3✓ (1)

3.1.2 I^B and I^A are codominant✓ in that they are expressed equally✓ in the phenotype./ I^B and I^A together✓ are codominant✓
Both I^B and I^A are dominant✓ to the recessive allele i . ✓/If either✓ I^B and I^A are with i they are dominant✓ (4)

3.1.3 **P₁** phenotype A group x B group✓
genotype $I^A i$ x $I^B i$ ✓

Meiosis

G I^A, i x I^B, i ✓

Fertilisation

F₁ genotype $I^A I^B, I^B i, ii, (I^A i)$ ✓

phenotype AB, B, O ✓ (A)

Parents and offspring✓/P₁ & F₁

Meiosis and fertilisation✓

(any 6)

(6)

OR

P₁ phenotype A group x B group✓
 genotype I^A i x I^B i✓

Meiosis

G

Fertilisation

F₁ genotype

 phenotype AB, B, O ✓ (A)

gametes	I ^A	i
I ^B	I ^A I ^B	I ^B i
i	(I ^A i)	ii

1 mark for correct gametes
1 mark for correct genotypes

Parents and offspring✓/P₁ & F₁

Meiosis and fertilisation✓

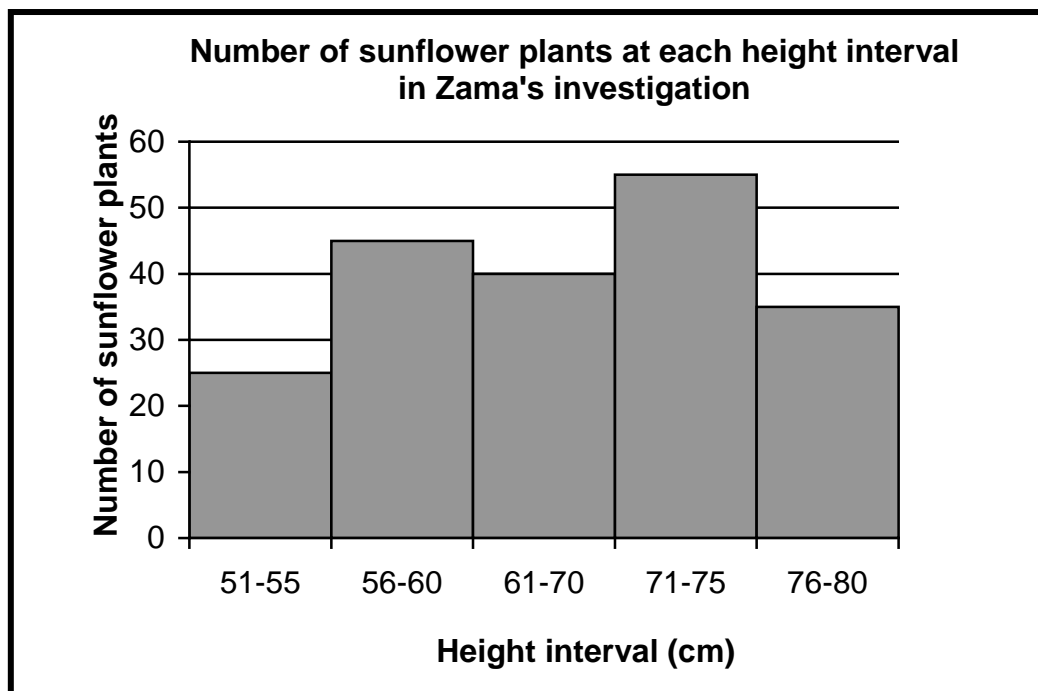
(any 6)

(6)

(11)

- 3.2 3.2.1 71–75✓ cm (1)
- 3.2.2 This increases the chances✓ of the sample being representative✓ of the plant population. (2)
- 3.2.3 Other factors like environmental factors✓/amount of light/soil type will also influence✓ the height to which sunflower plants grow. Genetic variation is only one of many factors✓ that influences the height/genotype tends to represent the potential✓ and environment actualises✓ the potential. (any 2) (2)
- 3.2.4 Zama✓ (1)
- 3.2.5 Zama included a larger number✓/10 of plants in the sample/bigger sample size. (1)
- 3.2.6 • The number of plants measured in each sample for both Zama and Previn must be the same. ✓
 • Measurements must be done at the same time✓
 • Measurements must be done on the same day✓
 • Increase the sample size in each of the selected areas✓
 • Repeat the investigation✓ (any 3) (3)

3.2.7

**Mark allocation of the graph**

Correct type of graph	1
Title of graph	1
Correct label for X-axis including units	1
Appropriate scale for X-axis	1
Correct label for Y-axis	1
Appropriate scale for Y-axis	1
Drawing of bars	1: 1–2 bars drawn correctly 2: 3–4 bars drawn correctly 3: All 5 bars drawn correctly

(9)

NOTE:

If the wrong type of graph is drawn:

- Marks will be lost for 'correct type of graph'

If axes are transposed:

- Marks will be lost for labelling of X-axis and Y-axis

(19)
[30]**TOTAL SECTION B: 60**

SECTION C**QUESTION 4**

- 4.1 4.1.1 Day 6 ✓ and day 17 ✓ (accept 6 or 7 and 17 or 18) (2)
- 4.1.2 32 ✓ arbitrary units ✓ (accept 32 to 33) (2)
- 4.1.3 The progesterone level ✓ stays high ✓ (2)
(6)
- 4.2 Non-identical ✓ /fraternal/dizygotic twins (1)
are produced when **(two egg cells) ✓** are **(fertilised by two sperms) ✓** (2)
- Identical ✓ /monozygotic/(Siamese/conjoined) twins (1)
are formed when **(one sperm) ✓ fuses with (one egg cell) ✓**
to form a zygote/blastula/undifferentiated cells of embryo which then splits up
into two ✓ (incomplete split in Siamese twins) (any 2) (2)
(6)
- 4.3 4.3.1 • Increasing the number of eggs developing, would increase ✓ the
chances of locating/removing ✓ the eggs
• Would increase ✓ the chances of success ✓ /because more than
one egg is fertilised
• More implanted ✓ increases success of one surviving ✓
(any 1 x 2) (2)
- 4.3.2 This simulates the normal ✓ temperature inside the human body (1)
- 4.3.3 Only after 3 days does the embryo ✓ develop to a stage that
implantation ✓ can take place successfully/Can be sure that the ova
are fertilised (2)
- 4.3.4 (a) • To help people with infertility problems ✓ to have children of
their own ✓
• Surrogate mother ✓ gives birth to another couple's child if
the mother cannot carry ✓ the foetus
• Can save extra embryos for later stage ✓ so they only need
to go through the process once ✓
(Mark first TWO answers only) (any 2 x 2) (4)
- (b) • Religious/cultural objection ✓ against God's will ✓
• Expensive ✓ only the rich will be able to afford it ✓
• It is experimentation/unethical ✓ with human life ✓ /
unnatural
• Abuse of human embryos ✓ left over ✓
(Mark first TWO answers only) (any 2 x 2) (4)
(13)

4.4 Possible answers for the mini essay**Advantage of using ultrasound**

- It is used to determine the age and size of the foetus✓
- It is used to determine whether there is more than one foetus present✓
- Ultrasound devices in particular are meant to ascertain whether the foetus is healthy and normal✓
- which helps parents to make a decision whether to have the baby✓
- and to receive the necessary counselling in making such a decision✓

Disadvantage of using ultrasound

- The technology is being abused✓ to abort foetuses✓ if they are not of the desired sex
 - Mistakes ✓ can be made that lead to the abortion of healthy foetuses✓
- (Max 4)

Advantages of using stem cells

- Provide replacements for tissues✓ /organs damaged by age/trauma/disease/improve the quality of life
 - Used for research to see whether it can cure different diseases✓ e.g. cancer/more reliable results when human stem cells are used
 - Stem cells from e.g. the blood from the umbilical cord can be stored✓ when needed in future because it would not be rejected✓ by the body's immune system
- (Max 4)

Disadvantages of using stem cells

- Expensive – research money could be used for other needs✓
 - Only rich people can afford to store stem cells for later use✓/expensive
 - Interfere with religion/culture/creation because it is immoral✓ /unethical/ we cannot play God
 - Moral/ethical objection because we are destroying a human life✓
 - The dangers of using stem cells are unknown and may be a risk✓
 - Can lead to illegal trade in embryos✓ /the placentas of new-born babies/ to make money
 - Embryos conceived and then aborted✓/abandoned/used for the stem cells
 - Can lead to using stored stem cells unethically✓ for others without permission
- (Max 4)

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 answer
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

Content: (12)
Synthesis: (3)
(15)

TOTAL SECTION C: 40
GRAND TOTAL: 150