



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

**LIFE SCIENCES P1
ADDITIONAL EXEMPLAR 2008
MEMORANDUM**

MARKS: 150

This memorandum consists of 9 pages.

SECTION A**Question 1****1.1**

- 1.1.1 A✓✓
 1.1.2 B✓✓
 1.1.3 B✓✓
 1.1.4 C✓✓
 1.1.5 B✓✓

5 x 2 = **(10)****1.2**

- 1.2.1 Double helix✓
 1.2.2 Gene✓
 1.2.3 Stem cells✓
 1.2.4 Double fertilisation✓
 1.2.5 Corpus luteum✓
 1.2.6 Heterozygous✓/hybrid

(6)**1.3**

- 1.3.1 F✓
 1.3.2 C✓
 1.3.3 D✓
 1.3.4 A✓
 1.3.5 G✓

5 x 1 **(5)**

- 1.4** E → B → C → A → F → D
(Mark in the correct order)

(6)**1.5**

- 1.5.1 2003 and 2004✓

(1)

- 1.5.2 100✓%

(1)

- 1.5.3 Table showing the number of pregnancies recorded in a province in South Africa

Year	Number of pregnancies
2001	200
2002	250
2003	350
2004	700
2005	750
2006	800

- Header✓
 Labelled columns correctly✓
 Labelled rows correctly✓
 Data in table: 4 to 6 correct✓✓
 1 to 3 correct✓

Draw table✓

(6)

1.5.4	1.5.5
Man's responsibility	Women have to bear the long period of pregnancy and then childbirth so the man must show some responsibility in preventing this.
OR	
Woman's responsibility	Women have more types of contraceptives available to them OR Women have to bear the long period of pregnancy and then childbirth
OR	
Responsibility of both	Formation of the baby involves the participation of the man and woman

(1)

(1)

1.6

1.6.1 8✓ (1)

1.6.2 25✓%✓ (2)

1.6.3 Ff✓✓ (2)

1.6.4 Individual B would have one dominant gene since he/she has free earlobes✓ and the other gene must be recessive since they were able to produce offspring with attached earlobes/the recessive characteristic✓ (2)

1.6.5 Two separate✓ (1)

1.6.6 One is male and the other is female✓
Identical twins are identical in every respect✓/from the same sex (2)

1.6.7 No✓ (1)

1.6.8 Since C and D have attached earlobes✓ they have only recessive genes✓ and can therefore have no dominant gene/gene for free earlobes to pass to their offspring✓. any (2)

TOTAL QUESTION 1: 50**TOTAL SECTION A: 50**

SECTION B**QUESTION 2****2.1**

2.1.1 Crossing over✓ (1)

2.1.2 B – Centromere✓
 C – Nuclear membrane✓
 D – Centrosome✓/centriole
 E – Homologous chromosomes✓ (4)

2.1.3 Part F/Spindle threads contract✓ to move chromosomes✓ towards opposite poles
 Allow for the attachment✓ of chromosomes✓ (any 1 x 2) (2)
(Mark first ONE only)

2.1.4 Metaphase✓ 1✓ (2)

2.1.5 Chromosomes arranged along the equator✓ in homologous pairs✓ (2)
(Mark first one only)

2.1.6 4✓ (1)

2.1.7 Ovary✓ (1)
(Mark first ONE only)

2.2

DNA	RNA
1. Double helix/double stranded	1. Single strand
2. Sugar is deoxyribose	2. Sugar is ribose
3. Thymine is a base	3. Uracil is a base
4. Equal number of A = T and G = C	4. Bases in any number and ratio
5. Occurs in the nucleus only	5. Occurs in the nucleus and cytoplasm

any 3 x 2 = 6
 +1 for table

(Mark first THREE differences only) (7)

2.3

2.3.1 A - Nucleus✓
 B - Ribosome✓ (2)

2.3.2 C - mRNA✓
 E - tRNA✓
 F - Amino acids✓ (3)

2.3.3 (a) Transcription✓ (1)

(b) Translation✓ (1)

2.3.4 C✓ A✓G✓ (3)

TOTAL QUESTION 2: [30]

QUESTION 3

3.1

3.1.1 The higher/lower the maternal age✓, the smaller/greater are the chances of having a baby with Down’s syndrome✓

OR

There is no relationship between the maternal age✓ of a women and the chance of having a baby with Down’s syndrome✓ (2)

3.1.2 The number of babies born with Down’s syndrome in relation to the age of the mother✓ (1)

3.1.3 45✓years✓ (2)

3.1.4 - She must be informed that she has a high risk of having a baby with Down’s syndrome✓
- She must go for an amniocentesis/ultrasound✓ (2)

3.1.5 - Upwardly slanting eyes✓
- Mental retardation✓
- Possibility of heart defects✓
- Hearing loss✓
- Decreased muscle tone✓
- Straight hair✓
- Small mouth and nose✓
- Round face✓
- Depressed nasal bridge✓
(Mark first THREE only) any (3)

3.1.6 - The two chromosomes (pair 21)/ does not separate✓during meiosis/gamete formation
- and therefore there is an extra chromosome✓in the zygote/new offspring (2)

3.2 ✓P₁ phenotype Brown x Grey ✓
genotype Bb x bb✓

✓Meiosis

G₁ B, b x b ✓

✓Fertilization

F₁ genotype Bb ; bb ✓
phenotype 1 brown;1 grey✓

gametes	b
B	Bb
b	bb

OR
1 mark for correct gametes
1 mark for correct genotypes

Allocation of marks

Showing the P1(parents), G1(gametes) and F1(offspring) generation – 1 mark

Showing meiosis – 1 mark

Showing fertilisation – 1 mark

Each correct step of problem – 5 marks

(8)

- 3.3.1 To insert the DNA✓/nucleus of sheep that you want to clone✓ (2)
- 3.3.2 No✓ (1)
- 3.3.3 Dolly will have exactly the same DNA✓ as the first donor sheep✓/DNA of the second donor was removed and replaced (2)
- 3.3.4 Mitosis✓ (1)
- 3.3.5 They might feel that scientists want to play God✓ in creating new life✓
The purpose✓ of the clones might be questioned – will they be used for 'spare' organs✓ etc.
The possibility of harmful micro-organisms being released either accidentally or purposely✓ (any 2 x 2) (4)
(Mark first TWO only)

TOTAL QUESTION 3: 30

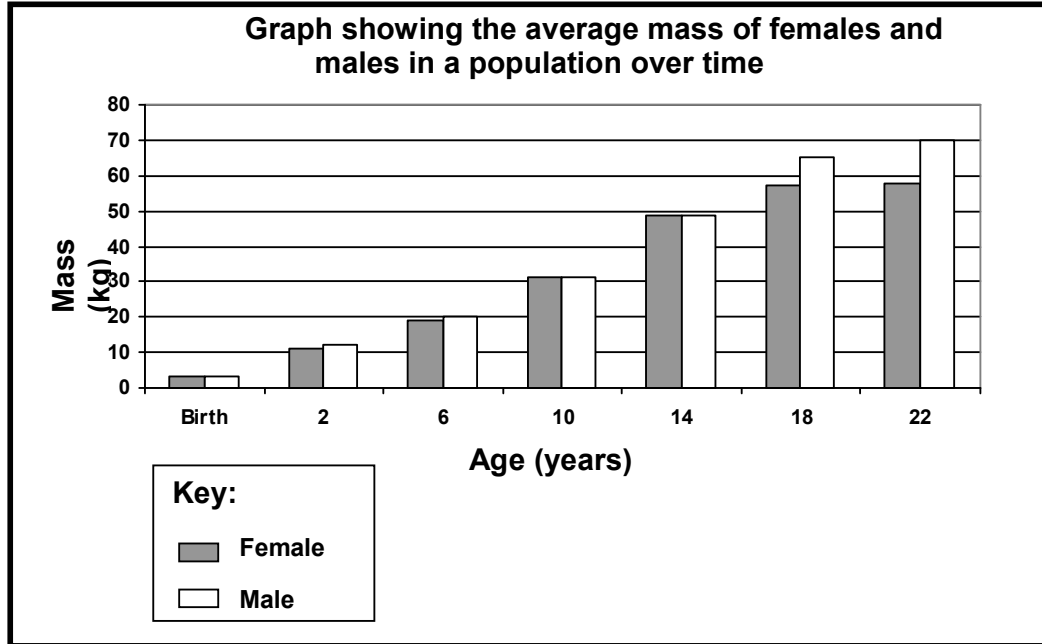
TOTAL SECTION B: 60

SECTION C

QUESTION 4

4.1

4.1.1



Rubric for the mark allocation of the graph

Correct type of graph	1			
Title of graph	1			
Correct label for X-axis/ correct labels for bars	1			
Correct label for Y-axis	1			
Clear distinction between female and male/ Key	1			
Constant width of bars	1			
Appropriate scale for Y-axis	1			
Plotting of the bars	5: draws 7 to 8 bars correctly	4: draws 5 to 6 bars correctly	3: draws 3 to 4 bars correctly	2: draws 1 to 2 bars correctly

NOTE:

Wrong type of graph drawn: marks lost for "correct type of graph" as well as for drawing of the bars. (12)

4.1.2 14✓ years✓ (2)

4.1.3

- From birth to 6 years✓ males have slightly higher average mass compared to females✓
- From 10 years to 14 years✓ males and females have the same average mass✓
- From 18 to 22 years✓ males have a much higher mass than females✓

(Mark first TWO only)

any 2 x 2 (4)

4.2

4.2.1 (a) 44XX✓
(b) 44XY✓ (2)

4.2.2 (c) girl✓
(d) boy✓ (2)

4.2.3 50% ✓ /equal chance that the fourth child would be a boy or a girl
Half of all the sperm of the father carry the X chromosome✓ and half
of all the sperm carry the Y chromosome✓ (3)

4.3 Advantage/disadvantage of 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 counselling necessary in making such a decision✓
- The technology is now being abused to kill unwanted female foetuses✓/in some cultures it is more expensive to have girls because of the dowry system

max (4)

Disadvantage of daughters

- Our constitution states that males and females are equal✓
- In SA the lobola system is practiced by many in which the man pays the woman's family before he marries - the woman is therefore an asset✓
- In the dowry system, especially in poor families, daughters could ruin a family's finances✓
- Pregnant women are a liability for a thriving business✓

max (4)

Continuing abortion of female fetuses

- There would be more males than females born✓
- Not all the males would be able to find a female to marry✓/
there would be many unmarried males
- This would lead to competition for females✓
- This would lead to a decrease in the population✓

max (4)

ASSESSING THE PRESENTATION OF THE ESSAY

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

(3)

TOTAL QUESTION 4: 40
TOTAL SECTION C 4: 40
GRAND TOTAL: 150