



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

LIFE SCIENCES P1

MEMORANDUM

EXEMPLAR 2008

This memorandum consists of 11 pages.

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

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

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

- 1.2.1 Identical twins✓
 1.2.2 Amniocentesis✓
 1.2.3 Genome✓
 1.2.4 Haemophilia✓
 1.2.5 Chiasma✓
 1.2.6 Labour✓

(6)**1.3**

- 1.3.1 B✓
 1.3.2 D✓
 1.3.3 E✓
 1.3.4 H✓
 1.3.5 F✓

(5)**1.4**

- 1.4.1 A - Ovary✓
 E - Fallopian tube✓
 G- Endometrium✓

(3)

- 1.4.2 Ovulation✓

(1)

- 1.4.3 day 14/middle of menstrual cycle✓

(1)

- 1.4.4 Fertilisation✓ take place.

The sperm✓ (n) fuses with the ovum✓(n) to form a zygote✓ (2n)

any **(3)**

- 1.4.5 (a) 23✓
 (b) 46✓
 (c) 23✓

(1)**(1)****(1)****(11)**

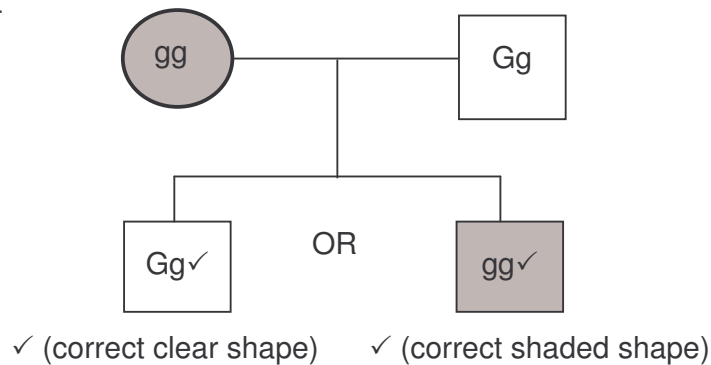
1.5

1.5.1 1 - Gg✓
3 - Gg✓ (2)

1.5.2 gg✓ (1)

1.5.3 Yes✓ (1)

1.5.4



(4)

1.5.5 - Understand that there will be a 50% chance of having a normal child and 50% having a child with cystic fibrosis ✓
- Go for genetic counselling✓
- Accept responsibility for their decision✓/make an informed decision (3)

(11)

1.6

1.6.1 B✓ (1)

1.6.2 XX✓chromosomes✓/ Two identical sex chromosomes (2)

1.6.3 A✓ (1)

1.6.4 Down's syndrome✓ (1)

1.6.5 Caused by a faulty meiotic division✓/oogenesis during production of the ovum/spermatogenesis during sperm production
The chromosomes of chromosome pair 21 fail to separate✓

(2)

(7)

TOTAL QUESTION 1: [50]
TOTAL SECTION A: [50]

SECTION B**Question 2****2.1**

- 2.1.1 Homologous✓ (1)
- 2.1.2 Spindle thread✓/spindle fibre (1)
- 2.1.3 Metaphase✓ 1✓ (2)
- 2.1.4 4✓ (1)
- 2.1.5 2✓/half (1)
- (6)**

2.2

- 2.2.1 Scientific knowledge can change✓ according to the availability of new evidence✓ (2)
- 2.2.2 Scientists of the seventeenth century only had simple magnifying equipment✓ and therefore could not see what was contained inside a sperm✓/ egg cell (2)
- 2.2.3 The development of advanced microscopic equipment✓ allowed scientists to see the nucleus of the egg and sperm cell✓
There was no evidence of a completely formed miniature human being in them✓ any (2)
- 2.2.4 - In meiosis the number of chromosomes is reduced to half✓ of the original number (2n).
- The new cells formed are the gametes(n) ✓
- With fertilisation gametes fuse to form a zygote✓
OR any other acceptable answer any (2)
- (8)**

2.3

- 2.3.1 When the genetic code of food is changed✓ by introducing a foreign/new gene✓ into food (2)
- 2.3.2 To enable an organism to become resistant to a disease✓/pathogen/ weed killers
In order to produce a very high yield of a particular food type✓ (2)
(Mark first TWO only)
- 2.3.3 40✓ (1)

2.3.4 Table showing the results of the survey on GM food

	Number of people	
	Yes	No
Question 1	5	35
Question 2	10	30

Header✓

Labelled columns correctly ✓

Labelled rows correctly✓

Data in table: 3 or 4 correct✓✓

1 or 2 correct✓

Draw table✓

(6)

2.3.5 Increase✓ the number of people✓ participating in the survey

The people✓ in the survey must be randomly✓ selected

Ensure that people are selected✓ from all sections of society✓ any 2 x 2 (4)

(Mark first TWO only)

- 2.3.6 - Most of the people sampled do not consider GM food to be better than normal food
- Most of the people sampled are not aware of the dangers ✓in using GM food
- Even though most people sampled are not aware of the dangers of GM foods, the majority of them do not consider GM food to be better than normal food✓

any (1)

(16)**Total Question 2: [30]**

Question 3**3.1**

3.1.1 DNA✓ (1)

3.1.2 1 – Hydrogen bond✓
5 – Cytosine✓ (2)

3.1.3 Nucleotide✓ (1)

- 3.1.4 - DNA produces two exact copies of itself. ✓
 - During interphase/before cell division ✓.
 - Two chromatids that are identical are formed✓
 - The two chromatids are identical to that of the parent✓

any (2)
(6)**3.2**3.2.1 (a) The synthesis of mRNA✓ from a DNA template✓/by
complementary matching of the nitrogenous bases in DNA (2)

(b) The process of converting the information carried by mRNA✓
 to the correct sequence of amino acids ✓to form a particular protein✓
 any (2)

3.2.2 CAA✓ UAC✓ ACC✓ (in sequence) (3)

3.2.3 Phenylalanine✓ Valine✓ Methionine✓ (in sequence) (3)

(10)

- 3.3 (i) Add *S. aureus* into the petri dishes✓
 (ii) Allow a few hours for bacterial growth ✓(incubation)
 (iii) Add the antibiotic✓in a specific area
 (iv) Observe the effect of the antibiotic after several hours✓
 (v) Set up a control where no antibiotic is added✓ (4)
(Mark any FOUR in the correct order)

3.4.1 No✓ (1)

3.4.2 There was more than 1 person involved in the murder✓✓/
possibly 2✓✓ (2)

3.4.3 Suspect 1✓ (1)

3.4.4 The DNA fingerprint of the skin found under the victim's fingernail
matches the DNA fingerprint of suspect 1✓ (1)

3.4.5 No✓ (1)

3.4.6 - The hair/skin tissue could have been planted✓ at the crime scene✓

OR

- The DNA from the skin tissue could have been under the victim's fingernails✓
- before the murder✓

OR

- The suspect may have an identical twin✓ who has the same DNA fingerprint✓

OR

- The samples taken may be mixed✓ with others✓ in the laboratory (2)

3.4.7 Tracing criminals✓ would be made easier✓

OR

It infringes on the rights of people✓ who might not want their fingerprint done✓

OR

It would cost the country too much money✓ which could be used for basic needs like food/housing✓ (2)

Total Question 3: [30]

TOTAL SECTION B: [60]

SECTION C**Question 4****4.1**

4.1.1 Many cases are not officially recorded✓

Many people don't know yet whether they are HIV positive✓

Figures often represent testing of a sample of people and cannot necessarily be projected to the whole of a country's population✓ any (2)

4.1.2

Calculations

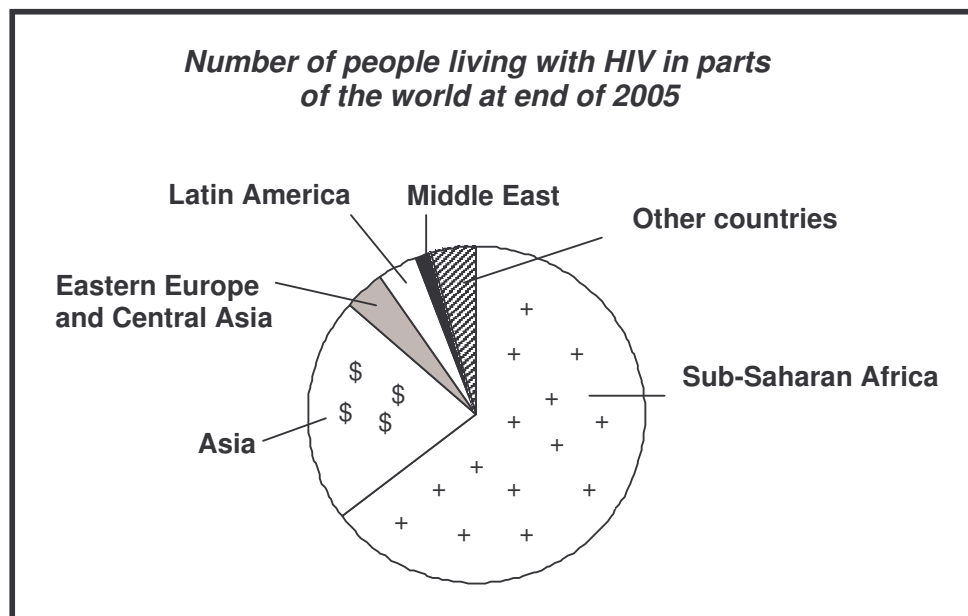
1. Sub-Saharan Africa: $25/38,6 \times 100 = 64,77\%$
2. Asia: $8,3/38,6 \times 100 = 21,50\%$
3. Eastern Europe and Central Asia: $1,5/38,6 \times 100 = 3,87\%$
4. Latin America: $1,6/38,6 \times 100 = 4,15\%$
5. Middle East: $0,44/38,6 \times 100 = 1,14\%$
6. Other countries: $1,76/38,6 \times 100 = 4,56\%$

Rubric for the mark allocation of the calculations

Marks	Calculations
1	1 - 2 correct
2	3 - 4 correct
3	5 - 6 correct

(3)

4.1.3



Rubric for the mark allocation of the graph

Correct type of graph	1
Correct proportions	1: 1 - 2 correct 2: 3 - 4 correct 3: 5 - 6 correct
Label / key for each slice	6 x 1 = 6
Title	1

NOTE: If the wrong type of graph is drawn: marks will be lost for "correct type of graph" as well as for drawing the slices in correct proportions.

(11)

- 4.1.4 Greater level of poverty✓ and lack of knowledge of the disease in Africa✓
Women have little power✓ over sexual relations in Africa✓/
Any other logical suggestion
(Mark first TWO only)

(4)

- 4.1.5 Partners need to know their HIV status✓ so that they can be protected if necessary✓

OR

This can cause a lot of distrust ✓ between partners✓

OR

HIV testing✓ has costs implications✓

OR

Any other logical answer

(2)

4.2

Agree ✓	OR	Disagree✓
Technology✓ is there to use for their convenience✓		Against religious beliefs✓ to use any contraceptive methods✓
Any other logical reason		OR
		Negative side effects✓ like infertility after prolonged use/heart disorder✓
		Any other logical reason

(3)

4.3**(a) Possible answers for Anti-abortion**

- The unborn foetus is a living being✓ from conception✓ (fertilisation has taken place)
- The foetus has a brain✓, heart and other organs early in its development✓ (by 10 weeks) and can therefore feel pain
- Abortion is legalised killing/murder✓ since you are taking away a life✓
- Many religions and cultures do not condone abortion✓ – this goes against their morality/ethics✓ that could lead to conflict in the family
- The mother-to-be also experiences deep emotional trauma and depression✓ long after she has aborted her child – even if she has made the choice to abort✓
- Why should abortion be condoned✓ when there are many contraceptive methods available✓
- Couples that have sexual relations must be responsible/ if a baby is conceived✓ it should be accepted and loved - no matter what✓
- Any other acceptable reason

Any 4 x 2 (8)

OR**Possible answers for Pro-abortion**

- Abortion is legal in South Africa✓ – it is enshrined in our constitution – women have a choice✓
- The foetus does not have the status of a child✓ in South Africa✓
- Abortion is better✓ than bringing an unwanted child into the world and abandoning it✓
- The abandoned child could possibly have anti-social behaviour✓ and become a problem✓
- Sometimes women do not have a choice about the use of contraceptives/ it is male controlled✓ – she falls pregnant not out of choice – abortion is the only option in this case✓
- Any other acceptable reason

Any 4 x 2 (8)

(b) Methods of birth control**Natural methods**

- Abstinence✓ simply means not having sexual intercourse✓
- Rhythm method✓ – the couple engages in sexual intercourse but only during times when fertilisation is not likely to occur i.e. no sexual intercourse 3 - 4 days before and after ovulation✓

Chemical methods

- Spermicidal – creams or foams that destroys sperm in the vagina✓
- Contraceptive pill✓ – hormonal control that prevents ovulation and therefore conception✓

Mechanical/barrier methods

- Condom✓ – sheath that traps sperm and prevents it from entering the vagina✓
- Femidom✓ – used by a female – also traps sperm and prevents it from entering the uterus✓
- Diaphragm✓ – a cap that fits over the cervix – stops the passage of sperm✓
- Intra-uterine-device (IUD) ✓ – small piece of metal or plastic which is retained inside uterus and which prevents implantation of the embryo✓

Surgical methods

- Vasectomy✓ – small cuts are made into the scrotum and the sperm ducts are tied/cut – prevents sperm from entering the urethra✓
- Ligation/female sterilisation✓ – two Fallopian tubes are cut/tied so that no ova enters the uterus – also sperm can swim up to fertilise the ovum✓

Any 2 x 2 (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)

(15)

Total Question 4: [40]