education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES P1

NOVEMBER 2008

FINAL MARKING GUIDELINE – 29 November 2008

Signatures:

This memorandum consists of 13 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES 2008

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 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 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 is accepted at *this* memo discussion.

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 External Moderator/s

20. Only memoranda bearing the signatures of the UMALUSI moderators and distributed by the National Department of Education via the Provinces must be used.

SECTION A

QUESTION 1

1.1

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

(6 x 2) **(12)**

1.2

1.2.1 Corpus luteum✓
1.2.2 Acrosome✓
1.2.3 Asexual/vegetative✓
1.2.4 Phenotype✓
1.2.5 Centromere✓
1.2.6 Cytokinesis✓
1.2.7 Mutations✓
1.2.8 Genes✓

(8)

1.3

1.3.1 E✓ (H- concession for 2008 only)
1.3.2 G✓
1.3.3 F✓
1.3.4 D✓
1.3.5 C✓

(5)

1.4

1.4.1 The breakdown ✓/discharge of the lining✓/blood/endometrium of the uterus (2)

1.4.2 From day 0 – 5✓ (1)

1.4.3 A decrease✓✓/lowering/drop in the level of progesterone and oestrogen directly before menstruation (2)

1.4.4 Uterus lining becomes thicker✓✓/ more vascular/ more glandular (2)

1.4.5 To prevent the breakdown of the uterine lining✓
to prevent spontaneous abortion (miscarriage) ✓/retain the foetus/ prevent premature labour

(2)
(9)

1.5

1.5.1 female✓ (1)

1.5.2 The sex chromosomes/23rd pair have the same size and shape✓✓/identical in appearance
OR
XX✓✓ chromosomes present/two X chromosomes present
OR
No Y chromosome✓✓/no XY chromosomes (2)

1.5.3 47✓/46 +1 /23 pairs +1 (1)

1.5.4 Down's syndrome✓/Trisomy 21 (1)
(5)

1.6

1.6.1 (a) 13✓ (1)
(b) 26✓ (1)

1.6.2 Has a full set✓ of chromosomes✓ /Diploid number of chromosomes/ complete set of chromosomes/26 (2)

1.6.3 They have same/identical chromosomes✓/genetic material/DNA from the nucleus of the somatic/body cell collected from the same frog/X✓ (2)

1.6.4 Cloning✓ (1)

1.6.5 (a) In favour:
- Producing individuals with desired traits✓✓
- Better yield✓✓
- Resistant to diseases✓✓
- Organisms produced in a shorter time✓✓
- Saving endangered species✓✓
- Producing body parts✓✓
- Produce offspring for organisms that cannot have offspring✓✓

(***Mark FIRST answer only in learner's script)*** (1 x 2) (2)

(b)Against:
- Objection to interfering with God's✓✓/Supreme Being's creation/nature
- Reducing the gene pool by reducing variation✓✓/ Reduces genetic diversity
- Cloned organisms may have developmental/morphological problems✓✓
- Costly process✓✓
- May generate more experimental waste✓✓
- May lead to killing of clones to obtain spare body parts✓✓
- Cruelty to animals✓✓

(***Mark FIRST answer only in learner's script)*** (1 x 2) (2)
(11)

TOTAL SECTION A: [50]

SECTION B

QUESTION 2

2.1

2.1.1 (a) A - Transcription✓ (1)
(b) B - Translation✓ (1)

2.1.2 C - Ribosome✓ (1)

2.1.3
- Process is called transcription✓
- Free (RNA) nucleotides✓
- from the nucleoplasm✓
- arrange according to the base sequence✓ of the DNA template
- in a complementary✓ way
- A - U✓
- C - G✓
- Sugar-phosphate bonds form✓ between nucleotides to form required mRNA
- Process controlled by enzymes✓ max (5)

2.1.4 1 - GUU✓✓
2 - CAA✓✓
3 - CGT✓✓ (3 x 2) (6)
(14)

2.2

2.2.1
- Monitor foetal health✓
- Identify birth defects/mutations/diseases✓
- Present families with options to reduce possible risks✓
- Determine the age and growth✓/development
- Determine the gender✓/sex of the foetus
- Determine the Rh (rhesus) compatibility✓
- Determine paternity✓

(Mark first TWO answers only in learner' s script) (2)

2.2.2
- Parents need to be informed about the risks and benefits✓ of the procedures
- Reduce fear of test results✓
- Be aware of the choices available✓should the pregnancy prove to be abnormal/helps parents in decision-making

(Mark first TWO answers only in learner' s script)
(2)
(4)

2.3

2.3.1 A - daughter chromosome✓/chromatid
B - Spindle✓ thread/spindle fibre (2)

2.3.2 Anaphase✓ II✓ (2)

2.3.3 2✓ (1)

2.3.4 2✓ (1)
(6)

2.4

P_1✓ phenotype Red x white✓
genotype RR x rr✓

Meiosis

G R x r ✓

Fertilization

F_1 ✓ genotype Rr✓
phenotype red✓

OR

gametes	R	R
r	Rr	Rr
r	Rr	Rr

1 mark for correct gametes
1 mark for correct genotypes

max **(6)**
[30]

QUESTION 3

3.1

3.1.1 Most✓ learners in the school can roll their tongue✓
OR
Most✓ learners cannot roll their tongue✓
OR
Equal✓ number of rollers and non-rollers✓
OR
Difference✓ in the number of rollers and non-rollers✓
OR
Tongue rolling occurs✓/does not occur among the learners✓ (2)

3.1.2 Grade 10✓ (1)

3.1.3 The number of rollers and non-rollers in the different grades

Grade	Rollers	Non-rollers
8	160	40
9	150	50
10	180	20
11	140	60
12	120	80

OR

The number of rollers and non-rollers in the different grades

Grade	8	9	10	11	12
Rollers	160	150	180	140	120
Non-rollers	40	50	20	60	80

Caption✓
Correct column headings✓
Correct row headings✓
Data in table: 5 rows correct✓✓✓
3 to 4 rows correct✓✓
1 to 2 rows correct✓
Drawing of table✓ (7)

3.1.4 160 + 150 + 180 + 140 + 120 = 750✓
40 + 50 + 20 + 60 + 80 = 250✓
750 ÷✓ 250 **OR** 750/250✓ **OR** 750✓ ÷✓ 250✓

3 : 1✓ / 75% : 25% / ¾ : ¼ **OR** 1 non-roller: 3 rollers (4)
(14)

3.2

3.2.1 (a) homozygous dominant✓and heterozygous✓ (2)

(b) homozygous recessive✓ (1)

3.2.2 Normal is dominant and the dominant condition✓
can show up in either homozygous or heterozygous state✓
OR
To have a normal child ✓ the person (1) must have at least one
dominant gene✓/phenotype is normal (2)
(5)

3.3

3.3.1

May have fewer side effects✓
May not be contaminated✓/will be in it's natural form
No problem from a religious perspective✓
Can be mass produced✓/produced faster
Avoids killing animals✓
(Mark first THREE answers only in learner's script) (3)

3.3.2 Against:
- risk to human health✓
- risk to the environment✓
- risk to the health and well-being of other organisms✓
- interference with nature✓/God's creation
- cultural sensitivity✓e.g. objection to the use of pigs and cows

(Mark first TWO answers only in learner's script) (2)
(5)

3.4

3.4.1 In a heterozygous condition✓ the dominant allele expresses
itself in the phenotype✓, masking the effect of the recessive allele✓
OR
When two individuals with pure breeding✓contrasting characteristics ✓
are crossed,the F_1-generation all display the dominant✓characteristic (3)

3.4.2 Each characteristic is regulated by two alleles✓/factors which separate✓
during meiosis so that each gamete contains only one of the
alleles✓/factors (3)
(6)
[30]

TOTAL SECTION B: 60

SECTION C

QUESTION 4

4.1

4.1.1
- Many cases are not officially reported✓/only some people visit clinics
- Many people do not know yet whether they are HIV positive✓/ window period
- Figures often represent testing of a sample of people which may not be representative of the population as a whole✓
- People may have emigrated✓/immigrated
- Human error in diagnosis or compiling statistics✓
- Statistics are old/not current✓

(Mark first TWO answers only in learner's script) (2)

4.1.2 (a) KwaZulu-Natal✓ (1)

(b) Western Cape✓ (1)

4.1.3
- More condoms freely available✓
- Successful educational programmes✓/Awareness of spread of HIV
- People are more faithful to their partners✓
- Abstention✓
- Inaccurate data✓/manipulation of data
- More people with HIV-AIDS have died and are not part of the statistics any more✓
- Fewer mother to child transfer takes place✓

(Mark FIRST answer only in learner's script) (1)

4.1.4 (a)
- Awareness of HIV status would enable partners to be protected if necessary✓
- Planning by the government and other agencies for medical care, budget, ARVs✓
- Help infected people and prevent further infection✓
- Increase faithfulness of partners to each other✓
- Job creation related to HIV testing✓
- More accurate statistics will become available✓

(Mark first TWO answers only in learner's script) (2)

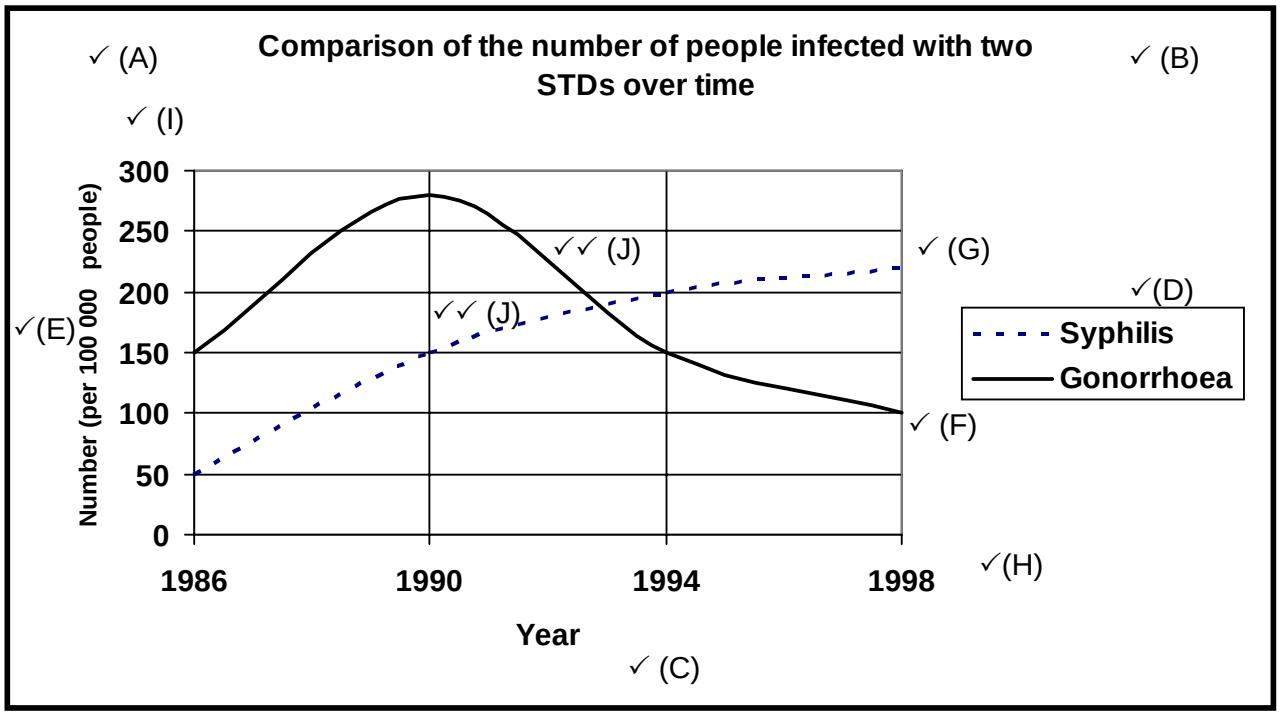
(b)
- Take away individual rights to make their medical condition public knowledge✓
- Information can be misused e.g. by employers to exclude HIV positive people✓
- Can be stigmatized ✓/discriminated against
- Increased suicide rate✓
- The cost of testing could be unaffordable to the government✓ /individual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

(Mark first TWO answers only in learners scripts) (2)

(9)

4.2

4.2.1



Rubric for the mark allocation of the graph

A	Correct type of graph	1
B	Title of graph	1
C	Correct label for X-axis	1
D	Graphs labelled/key provided for 2 graphs	1
E	Correct label for Y-axis including **unit**	1
F	All points joined for graph A	1
G	All points joined for graph B	1
H	Appropriate scale for X-axis	1
I	Appropriate scale for Y-axis	1
J	Drawing of the graphs	1 – 1 to 2 points plotted correctly 2 – 3 to 5 points plotted correctly 3 – 6 to 7 points plotted correctly 4 – all 8 points plotted accurately

(13)

Note:

If the wrong type of graph is drawn:

- marks will be lost for "correct type of graph" (A)
- marks will be lost for joining of points (F,G)

If graphs are not drawn on the same system of axes

- mark the first graph only using the given criteria

If axes are transposed:

- marks will be lost for labelling of X - axis and Y- axis (C,E)

4.2.2 Syphilis – the number of infections has increased✓ from 1986 to 1998
Gonorrhoea – the number of infections has increased✓ from 1986 to 1990 and then decreased ✓ (3)
(16)

4.3 Possible answers to mini-essay

Accept any 1 ethical use (1x2 marks) **AND** any 1 unethical use (1x2 marks) **OR** Accept any 2 unethical uses (2x2 = 4 marks)

Ethical uses of the 'spare embryos'

- Could be available to people✓ that cannot have children✓
- Could be used to enhance research in embryology✓/genetic engineering to improve health/ensure survival of people✓
- Could be stored and used later by the people✓ – if *in vitro* fertilisation fails the first time or if the people want to have more children✓
- To produce human parts✓ to save lives✓

Unethical uses of the 'spare' embryos

- Could be sold to people that cannot have children✓/to anybody that can pay for it – lead to exploitation✓
- Could be used to do research in embryology/genetic engineering✓that may be unacceptable✓
- Could be stored✓ and misused later✓
- To produce human parts✓ to sell on illegal market✓/rest of organism discarded
- Religiously unacceptable✓/objection due to lack of respect for life✓

Accept any 1 advantage (1x2 marks) **AND** any 1 disadvantage (1x2 marks) **OR** Accept any 2 disadvantages (2x2 = 4 marks)

Advantages in being allowed to choose the sex of a child

- Planning a family✓ so that one does not have too many children✓/does not have to continue having children until one gets ones preferred gender✓
- Planning to have a child of a particular sex✓ for various reasons like prevention of sex-linked diseases✓/cultural reasons
- Some people may specifically want a son✓ to continue the family name✓/as an heir
- Prevent the killing✓ of unwanted newly-born babies✓

Disadvantages in being able to choose sex of ones child

- Due to political/cultural reasons✓, there might be a preference for a particular gender✓
- Imbalances in ratio between males and females✓ – difficulty in finding partners✓
- Determining the sex of the embryo is an expensive process✓ – only the rich could afford this privilege✓
- Religious objection to the procedure ✓/ playing God- every child is a gift✓
- Increased abortion of unwanted foetuses ✓if it was not of the preferred gender/if carrying diseases✓

Accept any 1 view in support (1x2 marks) **AND** any 1 view against (1x2 marks)
OR
Accept any 2 views against (2x2 = 4 marks)

Views in support of use of contraceptives

- Could plan✓ how many children they can afford to have✓/prevents unplanned or unwanted babies /regulate population size
- Couples plan✓ - when✓ they want to have children
- Some contraceptives/condoms✓ assist in preventing STDs transmission✓

Views against the use of contraceptives

- Some religions/cultures✓ do not allow the use of contraceptives✓
- Claims that the use of contraceptives encourages illicit sex✓ since pregnancy is not a consequence✓
- Not 100% safe✓ so pregnancy may still result✓
- Side effects of contraceptive use✓ may cause pain✓/discomfort/decrease sexual pleasure.

Maximum (12)

Synthesis

Description	Marks
Not attempted/ No relevant information provided	0
ONE or TWO issues explained with some irrelevant information	1
TWO issues explained with no irrelevant information/ All THREE issues explained with some irrelevant information	2
All THREE issues explained with no irrelevant information	3

(3)
(15)

TOTAL SECTION 4: 40
GRAND TOTAL: 150