education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 12

LIFE SCIENCES

JUNE 2024

MARKING GUIDELINES

MARKS: 150

This marking guidelines consists of 12 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES

1. **If more information than marks allocated is given**
   Stop marking when maximum marks are 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 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)

SECTION A

QUESTION 1

1.1	1.1.1	D✓✓		
	1.1.2	D✓✓		
	1.1.3	C✓✓		
	1.1.4	D✓✓		
	1.1.5	D✓✓		
	1.1.6	C✓✓		
	1.1.7	C✓✓		
	1.1.8	D✓✓		
	1.1.9	D✓✓	(9 x 2)	**(18)**
1.2	1.2.1	Allele✓		
	1.2.2	Haemophilia✓		
	1.2.3	Corpus Luteum✓		
	1.2.4	Centriole ✓		
	1.2.5	Parasympathetic system✓		
	1.2.6	Sensory neuron✓		
	1.2.7	Hypothalamus✓		
	1.2.8	Mitochondrion✓		
	1.2.9	Amniotic egg✓	(9 x 1)	**(9)**
1.3	1.3.1	None ✓✓		
	1.3.2	B Only✓✓		
	1.3.3	None ✓✓	(3 x 2)	**(6)**

1.4 1.4.1 Ffhh✓ (1)

1.4.2 (a) FfHh✓✓ (2)

(b) 9✓ (1)

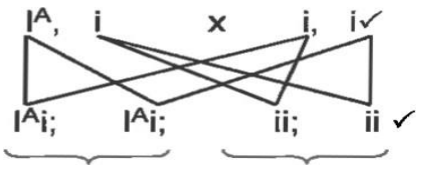
(c) H✓ (1)

(d) Short finger✓ and widow peak✓ (2)
(7)

1.5 1.5.1 Three ✓/3 (1)

1.5.2 I^A ✓ and I^B ✓ (2)
(**MARK FIRST TWO ONLY)**

1.5.3 P1 Phenotype: Blood group A x blood group O ✓
Genotype: I^Ai ii ✓
Meiosis
✓ ✓ Gametes
Fertilization



F1 Phenotype: 2 Blood group A , Blood group O✓

Phenotypic Ratio : 1:1 ✓*

OR

P1 Phenotype Blood group A x Blood group O

Genotype I^Ai ii

Gametes	**I^A**	**i**
I	**I^Ai**	**ii**
I	**I^Ai**	**ii**

1 mark for correct gametes
1 mark for correct genotype

F1 2 Blood group A and 2 Blood group O ✓*

Phenotypic Ratio : 1 :1 ✓*

P1 and F1 ✓

Meiosis and Fertilization ✓ (7)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 Gene mutation✓ (1)

2.1.2 There is a change in sequence ✓ (of nitrogenous bases) from GGA to GGC✓ (2)

2.1.3 (a) five ✓/ 5 (1)

(b) UAC✓ and CUG✓ (2)

(c) - The codon GGA changed to GGC✓/6th codon has changed
- The anticodon/tRNA sequence changed✓
- The amino acids glycine✓
- was replaced by glutamic acid✓
- This resulted in a different protein✓/ no protein being formed. (4)
Any

2.1.4 - The double helix (DNA) unwinds✓
- and unzips✓/weak hydrogen bond break
- to form two separate strands✓
- One strand is used as a template✓
- to form mRNA ✓
- Using free RNA nucleotides from the nucleoplasm✓
- the mRNA is complimentary to DNA✓
- mRNA now has the coded message of protein synthesis. ✓ Any (5)

2.2 2.2.1 - Stimulates the development of secondary male characteristics
- Stimulates maturation of sperm cells /Needed for spermatogenesis.
(Mark first ONE only) (1)

2.2.2 - Surgery
- Administering testosterone / hormonal treatment (2)

2.2.3 $33\frac{1}{3}$✓ or 33,3% (1)

2.2.4 It increases the risk of testicular cancer✓ (1)

2.2.5 - The temperature of the testes will be too high✓/ not lower than body temperature (2)
- Therefore spermatogenesis will not occur ✓/ sperm will not mature
(7)

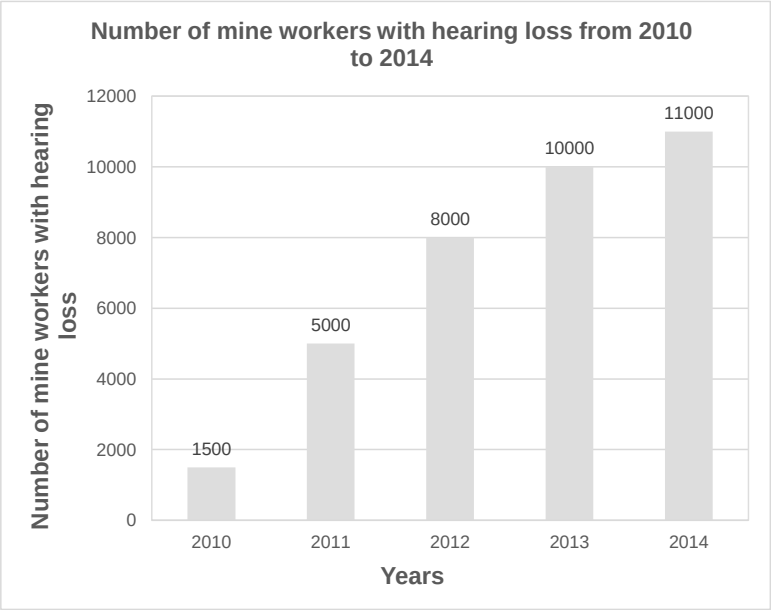
2.3	2.3.1	(a)	Three✓/3	(1)
		(b)	Two ✓/2	(1)
	2.3.2		Hearing✓	(1)
	2.3.3		- Neo and Jane can hear✓ - They have a child who is deaf✓ - This means they each carry an allele for deafness✓/ are heterozygous - But it is masked ✓by the dominant allele/which is for normal hearing	(4)
	2.3.4		AA and Aa ✓✓	(2)
				(9)

2.4 2.4.1 Cochlea ✓ (1)

2.4.2 $\frac{11000-1500}{1500}$ ✓X100✓ = 633.3✓% (3)

2.4.3 - More mines were built due increase in supply and demand✓
- More workers were employed✓
- More extended exposure to loud sound by mine workers✓
- Lack/Poor of safety measures in mines✓ Any (1)

2.4.4



Criteria	Mark allocation
Correct Type :Bar graph is drawn **(T)**	1
Caption of the graph including both variables **(C)**	1
Correct labels on X-axis and Y-axis : **(L)**	1
Correct scale on Y –axis and Equal with of bars and spaces **(S)**	1
Plotting **(P)**	
1 to 4 bars plotted correctly	1
All 5 bars are plotted correctly	2

(6)
(11)

2.5 2.5.1 centromere✓ (1)

2.5.2 Pair of chromosomes of the same shape, size and having similar genes of each characteristics occupying same position✓ (1)

2.5.3 Prophase 1✓
- Adjacent chromosome/parts of homologous chromosomes overlap✓/ touch each other and
- DNA / genetic materials are exchange✓
- at a point called chiasmata✓/chiasma (3)

2.5.4 - Four daughter cells will be formed✓ of which
- TWO will each have four chromosomes ✓and
- Other two will each have two chromosomes✓ (3)

(8)
[50]

QUESTION 3

3.1 3.1.1 Cynthia ✓ (1)

3.1.2 There are no matching bands✓/bars/pattern/DNA profile with both parents ✓ (2)
(3)

3.2 3.2.1 Uterus ✓ (1)

3.2.2 - Serve as birth canal✓
- Receive the penis during copulation✓/site where semen is deposited (2)

3.2.3 Oestrogen✓ (1)

3.2.4 - Causes the endometrium to thicken✓,
- to become more vascular and glandular✓
- to prepare for implantation✓ Any (2)

3.2.5 - The sperm will not be able to pass ✓
- To fuse with ovum✓
- Therefore, No fertilization will occur✓ (3)

3.2.6 - It has muscular✓ /elastic wall to allow the embryo increase in shape and size✓
- It is hallow ✓ to accommodate the developing foetus✓ Any one (2)
(**MARK FIRST ONE ONLY)**

3.2.7 - Diploid cells in the ovary undergo mitosis ✓
- To form numerous follicles✓
- Under the influence of FSH✓
- One cell inside the follicle enlarge✓ and undergoes meiosis✓
- To form mature ovum ✓ (5)
(16)

3.3 3.3.1 (a) Between 65 and 75✓ (1)

(b) - Learning ability ✓
- Orientation✓ Any 1 (1)
(Mark the first ONE only)

3.3.2 To determine if regular exercise reduces risk of Alzheimer's disease in humans. ✓✓ (2)

3.3.3 - Investigation did not establish the relationship between exercise ✓ and development of Alzheimer's disease ✓
- Since no changes in the nervous tissue were measured /period was short✓ (3)
(7)

3.4	3.4.1	(a)	Pinna ✓	(1)
		(b)	Oval window✓	(1)
	3.4.2		Releases pressure from the inner ear✓	(1)
	3.4.3		- Part D/Ossicles do not vibrate freely✓ - Fewer / No vibrations will be sent to the oval window✓ /inner ear - Fewer /No pressure waves will be set up in the cochlea✓ - The receptors / Organ of Corti will be stimulated less✓/Not stimulated - which lead to hearing loss✓ Any	(2)
	3.4.4		Transmits hearing impulses to the cerebrum✓ Transmits impulses to the cerebellum for balance ✓	(2)
	3.4.5		Deafness✓	(1)
	3.4.6		Hearing aids✓ /Cochlea implants	(1)
	3.4.7		- The cristae is stimulated ✓ - To convert the stimuli into impulses✓ - The impulse are sent to the cerebellum ✓ - Where they are interpreted✓ - The cerebellum sends impulses to the skeletal muscles✓ - To maintain balance✓ Any	(4) **(13)**
3.5	3.5.1		Sclera✓	(1)
	3.5.2		Near-sightedness ✓ /short-sightedness/ myopia	(1)
	3.5.3		Astigmatism ✓ - Light is refracted unevenly ✓ /distorted - forming a blurred image ✓ /broken lines are seen	(3)
	3.5.4		- Radial✓ - Circular✓	(2)
	3.5.5		- In dim light ✓ - Radial muscles contract ✓ - circular muscles relax ✓ - The pupil dilates ✓ - More light enters the eye ✓ Any 4	(4) **(11)** **[50]**

TOTAL SECTION B: 100
GRAND TOTAL: 150

Commented [MV1]: Please check another answer:
Transmits impulses to cerebellum for balance
First answer should be: Transmits hearing impulses to the serebrum.
Each one should be one mark for a total of 2