education

MPUMALANGA PROVINCE

REPUBLIC OF SOUTH AFRICA

PREPARATORY EXAMINATION

GRADE 12

LIFE SCIENCES P1

SEPTEMBER 2022

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist

of 12 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES

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**
   Marks for the first three irrespective of whether all or some are correct/incorrect.

3. **If whole process is given when only a part of it is required**
   Read all and credit the relevant part.

4. **If comparisons are asked for but descriptions are given**
   Accept if the 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 the 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 the answer, provided it does not mean something else in Life Sciences or if it is out of context.

13. **If common names are given in terminology**
    Accept if it appears on marking guidelines.

14. **If only the letter is asked for but only the name is given (and vice versa)**
Do not credit.

15. **If units are not given in measurements**
Marking guidelines will allocate marks for units separately, except where it is given in the question.

16. **Be sensitive to the sense of an answer, which may be stated in a different way.**

17. **Caption**
All illustrations (diagrams, sketches, graphs, tables, etc.) must have a cation.

18. **Code-switching of official languages (terms and concepts)**
A single word or two that appear(s) 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. **Changes to the memorandum**
No changes must be made to the marking guideline without consulting the cluster leader who in turn will consult with the curriculum implementer.

SECTION A

QUESTION 1

1.1	1.1.1	B✓✓		
	1.1.2	D✓✓		
	1.1.3	C✓✓		
	1.1.4	B✓✓		
	1.1.5	C✓✓		
	1.1.6	D✓✓		
	1.1.7	D✓✓		
	1.1.8	A✓✓		
	1.1.9	D✓✓		
	1.1.10	B✓✓	10 x 2	**(20)**

1.2	1.2.1	Insulin✓		
	1.2.2	Adrenal✓gland		
	1.2.3	Osmoregulation✓		
	1.2.4	Aqueous humour✓		
	1.2.5	Abscisic acid✓		
	1.2.6	Endocrine✓system		
	1.2.7	Hypothalamus✓		
	1.2.8	Hormones✓		
	1.2.9	Aldosterone✓		
	1.2.10	Pinna✓	(10 x 1)	**(10)**

1.3	1.3.1	B only✓✓		
	1.3.2	None✓✓		
	1.3.3	A only✓✓		
	1.3.4	B only✓✓	(4 x 2)	**(8)**

1.4	1.4.1	(a) External✓ fertilisation		(1)
		(b) Internal✓ fertilisation		(1)
	1.4.2	Ovipary✓		(1)
	1.4.3	Amniotic✓ egg		(1)
	1.4.4	- Allantois✓ - Chorion✓		(2) **(6)**

1.5	1.5.1	(a)	Seminal vesicle✓	(1)
		(b)	Cowper's gland✓	(1)
		(c)	Urethra✓	(1)
	1.5.2	(a)	B✓	(1)
		(b)	D✓/C	(1)
		(c)	A✓	(1)
				(6)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 (a) Meiosis✓ (1)

(b) Mitosis✓ (1)

2.1.2 23✓pairs/ twenty three pairs (1)

2.1.3 Oestrogen✓ (1)

2.1.4 **Spermatogenesis**✓*
-Under the influence of testosterone✓
-diploid cells in the seminiferous tubules of the testes✓
-undergo meiosis✓
-to form haploid sperm cells✓
***1 compulsory mark** + 3 (4)

2.1.5 (a) Morula✓ (1)

(b) Blastula✓/ blastocyst (1)

(c) Embryo✓ (1)

(d) Foetus✓ (1)
(12)

2.2 2.2.1 (a) Graafian follicle✓ (1)

(b) Ovulation✓ (1)

2.2.2 -It will lead to a drop in progesterone✓
-Which will lead to the endometrium breaking down✓ / menstruation to start
- the female will have a miscarriage✓/ loose the pregnancy (3)

2.2.3 -The hypophysis✓/pituitary gland
- secretes FSH✓
- which stimulates the development of a primary follicle✓
- in one of the ovaries✓
- Only one follicle develops to full maturity in every cycle✓
- into a mature Graafian follicle✓/structure **X** Any (4)

2.2.4
- Around day 14✓
- the Graafian follicle/ structure **X** is fully developed✓
- The mature Graafian follicle/structure **X** moves to the surface of the ovary✓
- forming a slight swelling✓
-There is a sharp increase in the concentration of LH✓
-The wall of the ovary ruptures✓
-The ovum✓/haploid secondary oocyte is released
- which is known as ovulation✓
- After ovulation the remains of the Graafian follicle✓/structure **X**
- developing into a mass of hollow cells the corpus luteum✓/structure **Z**

Any (4)
(13)

2.3 2.3.1
- Speeds up recovery✓
- Enhance milk production✓

Any (1)

2.3.2
- Serves as attachment for child to mother✓
- Secretes progesterone ✓
- Allows the diffusion of nutrients from the mother to the foetus✓
- Allows the diffusion of nitrogenous waste from the foetus to the mother✓
- Allows for gaseous exchange between the mother and the foetus✓
- Filters harmful substances e.g: drugs, medication, certain bacteria/pathogens✓
- Allow antibodies to protect foetus✓

(Mark first THREE only) Any (3)

2.3.3

Drugs/medication and other substances harmful to the foetus/baby may be retained in the placenta✓
This can now reach baby through breastmilk✓/ damage baby through breastmilk/ build up in mothers body

OR

Bacteria/viruses/fungi/pathogens captured in placenta✓
Can cause disease/infection in both mother and baby✓

OR

Excess nitrogenous waste still in placenta✓
May cause chemical imbalance/build-up of waste in mother or baby✓

OR

High levels of progesterone in placenta✓
Could lead to less milk production/ hormone imbalances✓ Any (2)
(6)

2.4 2.4.1 Thyroid stimulating hormone (TSH)✓ (1)

2.4.2 To establish homeostasis in an organism✓/ to maintain a constant internal environment (1)

2.4.3
- High levels of thyroxin are detected✓
- by the pituitary gland✓
- which leads to a decrease✓ in the secretion of TSH.
- Thyroid activity is slowed down✓ / less thyroxin is produced.
- Thyroxin levels drop back to normal✓ (5)

2.4.4
- If thyroxin levels remain low
- the basal metabolic rate (BMR) will be low✓
- and the person's body temperature will drop very low/ always feel cold✓
- chronic fatigue✓
- person may gain weight✓
- stunted physical growth✓
- slowed mental development✓
- slowed sexual development✓
- development of thick skin and tongue✓ Any (4)

(10)

2.5 2.5.1 **Changes in body temperature during strenuous exercise**

Exercise time (min)	Body temperature (°C)
Rest/0	37
20	37,5
40	38
60	38

Criteria to mark table

Description	Mark allocation
Heading (H)	1
Drawing of table (T)	1
Column headings (C) (independent and dependent variables with units)	1
Data (D)	1-3 corresponding data correct = 1 All corresponding data correct = 2

(5)

2.5.2 The body cools down naturally by excreting sweat✓
Which evaporates✓
The moist towels/sheets mimics the sweat✓ and
the wind source aids evaporation✓ Any (3)

(8)

TOTAL QUESTON 2 [50]

QUESTION 3

3.1 3.1.1 (a) Semi-circular canals✓ (1)

(b) Cochlea✓ (1)

3.1.2 (a) C✓ (1)

(b) B✓ (1)

3.1.3 - Loud sound✓/music cause a lot of vibrations in the ossicles/ pressure waves in the cochlea✓
- Excess vibrations are let out the round window **(E)** and the Eustachian tube **(D)**✓
- The Eustachian tube links to the throat, causing you the feel these excess vibrations in the throat✓ Any (3)

3.1.4 - Change in speed and direction of head causes endolymph in **semi-circular canals** to move✓
- Movement stimulates receptors: **cristae in ampulla**✓
- Cristae converts stimuli to nerve impulses✓
- Impulses transmitted by the vestibular and auditory nerve to cerebellum✓
- **Cerebellum** sends nerve impulses to muscles to restore the balance✓ (4)

Any

3.1.5 - Endolymph in the semi-circular canals keeps on moving✓
- Receptors send message to the cerebellum that movement is still occurring✓
- The brain interprets it as the child is still spinning✓/ spinning motion even though standing still

Any (2)

(13)

3.2 3.2.1 (a) A – Suspensory ligament✓ (1)

(b) B – Iris✓ (1)

3.2.2 Protects the inner parts of the eye✓ (1)

3.2.3 - No impulse will be transmitted✓
- to the cerebrum✓
- resulting in loss of vision✓ (3)

3.2.4 - Lens is elastic✓
Therefore can change shape✓/convexity/allow for accommodation
- Lens is transparent✓
to allow light rays to pass through✓
- Lens is biconvex✓
to refract light rays✓

(Any 2×2) (4)
(10)

3.3 3.3.1 (a) Neuron✓ (1)

(b) Reflex arc✓ (1)

(c) Corpus callosum✓ (1)

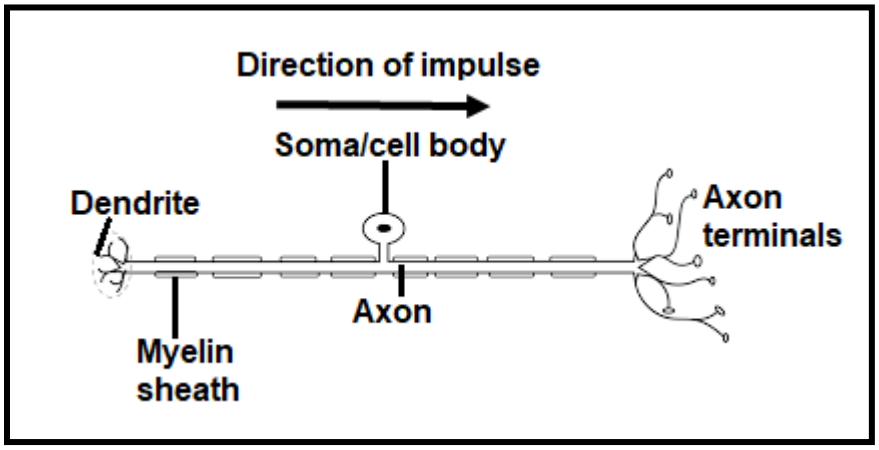
3.3.2 Positive effects on:
- learning✓
- memory✓
- fine motor skills✓
- verbal reasoning✓
- non-verbal reasoning✓ Any (1)

3.3.3 Cerebrum✓ (1)

3.3.4 - Ensures transmission of impulse in only ONE direction✓
- Impulses can be transmitted to more than one neuron simultaneously✓
- Filters unimportant✓/constant/weak impulses

Any (2)
(7)

3.4 3.4.1 **Sensory neuron**



Description	Mark allocation
Heading (H)	1
Correct diagram drawn (D)	1
Any TWO correct labels	2
Direction of impulse indicated correctly (A)	1

(5)

3.4.2 Conducts impulses from a receptor to the central nervous system✓/CNS (1)
(6)

3.5 3.5.1 Sympathetic✓ nervous system (1)

3.5.2
- Increased heart beat✓
- Increased breathing rate✓
- Dilated pupils✓
- Pale complexion✓
- Shivering✓
- Dry mouth✓
- Sweating✓
- Feeling of constantly needing to urinate✓

(Mark first FOUR only) Any (4)

3.5.3
- Adrenalin✓
- Adrenal gland✓ (2)

3.5.4
- Taking deep slow breaths✓
- Purposefully contracting muscles and relaxing them✓

Any (1)
(8)

3.6	3.6.1	(120✓ – 80)✓mm = 40✓ mm	(3)
	3.6.2	- Increase the number of plants used in each treatment✓/ group - Repeat the investigation✓ **(Mark first TWO only)**	(2)
	3.6.3	- Fruit / flowers grow on lateral branches✓ - Increased fruit / flower production✓ Any	(1)
			(6)
		TOTAL QUESTION 3	**[50]**
		TOTAL SECTION B:	**100**
		GRAND TOTAL:	**150**