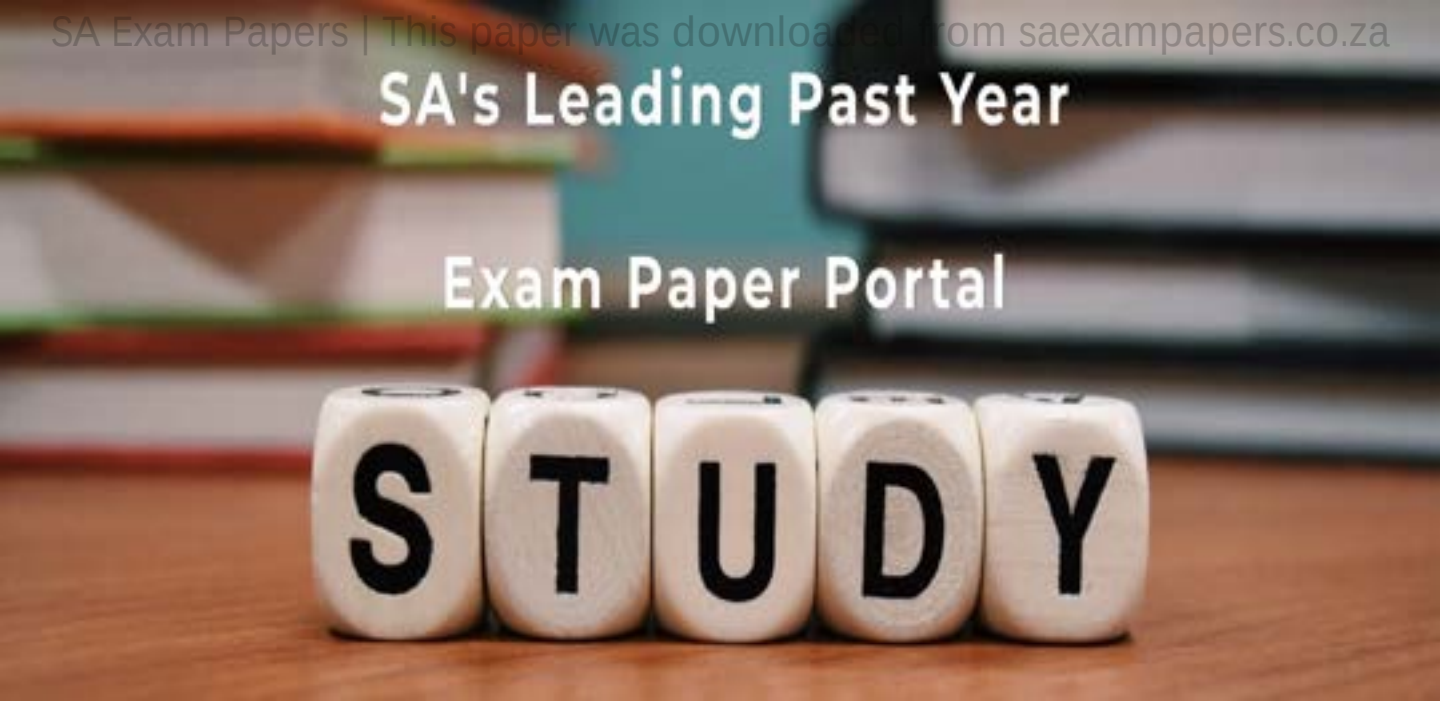

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GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PREPARATORY EXAMINATION

2023

MARKING GUIDELINES

LIFE SCIENCES (PAPER 1) (10831)

12 pages

PRINCIPLES RELATING TO THE MARKING OF LIFE SCIENCES

1. **If more information than marks allocated is given**
   Stop marking when maximum number of marks is reached and place a wavy line and 'max' in the right-hand margin.

2. **If, for example, three reasons are required and five are given**
   Mark only 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 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 recognisable, 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 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. **Changes to the marking guidelines**
No changes must be made to the marking guidelines without consulting the provincial internal moderator.

SECTION A

QUESTION 1

1.1 1.1.1 B ✓✓

1.1.2 A ✓✓

1.1.3 D ✓✓

1.1.4 A ✓✓

1.1.5 B ✓✓

1.1.6 A ✓✓

1.1.7 D ✓✓

1.1.8 C ✓✓

1.1.9 B ✓✓

1.1.10 A ✓✓

(10 x 2) **(20)**

1.2 1.2.1 Vulva✓

1.2.2 Adrenal ✓ gland

1.2.3 Homeostasis ✓

1.2.4 Cataract ✓

1.2.5 Copulation ✓

1.2.6 Fallopian tubes ✓

1.2.7 Carbon dioxide ✓

1.2.8 Goitre ✓

1.2.9 Morula ✓

(9 x 1) **(9)**

1.3	1.3.1	None ✓✓		
	1.3.2	A only ✓✓		
	1.3.3	Both A and B ✓✓	(3 x 2)	**(6)**
1.4	1.4.1	(a) A ✓ – Placenta ✓ **(Mark first ONE only)**		(2)
		(b) C ✓ – Vagina ✓ D ✓ – Cervix ✓ **(Mark first ONE only)**		(2)
		(c) B ✓ – Amniotic fluid ✓ **(Mark first ONE only)**		(2) **(6)**
1.5	1.5.1	Reflex arc ✓		(1)
	1.5.2	(a) A ✓		(1)
		(b) E ✓		(1)
		(c) B ✓		(1)
	1.5.3	C, D, F ✓ (accept any order)		(1)
	1.5.4	Dendrite ✓		(1)
	1.5.5	Vertebrae ✓ Meninges ✓ Cerebrospinal fluid ✓ **(Mark first TWO only)**	Any	(2)
	1.5.6	Myelin sheath ✓		(1) **(9)**

TOTAL SECTION A: [50]

SECTION B

QUESTION 2

2.1 2.1.1 Impairment of mental/physical performance✓/May pose a serious risk to health (1)

2.1.2 0,4 – 0,49 $L.h^{-1}$ ✓ (1)

2.1.3
– The hypothalamus/osmoreceptors is/are stimulated ✓
– and sends impulses to the pituitary gland ✓/hypophysis
– to secrete **more** ADH. ✓
– ADH increases the permeability of the renal tubules✓
– of the kidney.✓
– **More** water is reabsorbed into surrounding blood vessels. ✓
– The water level in the blood increases to normal ✓ levels.
– **Less** urine is produced✓
/Urine becomes **more** concentrated
/**Less** water is lost through urine. Any (5)

2.1.4
– Sweating increases ✓ causing the
– body temperature to decrease. ✓
– This is because more evaporation of sweat, ✓ causes
– **more** cooling of the skin surface/blood beneath skin surface. ✓ (4)

2.1.5
– Make shifts shorter/at cooler times of the day/morning and night. ✓
– Provide clothing/shade that helps to keep workers cooler.✓
– Supply sufficient (cold) water/fluids for workers. ✓ Any (2)
(13)

2.2 2.2.1 (a) A – Liver ✓
B – Pancreas ✓ (2)

(b) Insulin ✓ (1)

2.2.2 A regulatory substance in the body that stimulates cells to bring about change. ✓✓/A protein/chemical messenger in the body. (2)

2.2.3
– Excess glucose cannot be converted to glycogen ✓
– in the liver✓/organ A
– thus, the glucose level in the blood remains above normal✓ /blood glucose levels are high
– the person has diabetes.✓

Any (3)

2.2.4 Thyroxin ✓
Adrenalin ✓
Glucagon ✓ (3)
(11)

2.3 2.3.1 Phototropism ✓ (1)

2.3.2 Auxins ✓ (1)

2.3.3 A ✓ and B ✓ (2)

2.3.4
– Because the stem is exposed to unilateral light ✓/light from one side only,
– auxins/the hormone are/is destroyed by the light ✓/move away from light.
– causing the auxins/ hormone concentration to be high on the dark side ✓/side away from the light
– therefore, cells are stimulated to elongate/grow on the dark side. ✓/side away from the light.
– The auxin/ hormone concentration is low on the side receiving light ✓
– therefore, cells are not stimulated to elongate/ grow on this side.✓ / side facing the light
– Therefore, the plant bends/grows towards the light.

Any (4)

2.3.5 – As auxins are removed ✓
– plants are kept short ✓/fruit is closer to the ground
– fruit is easier to pick ✓/harvest.
– Therefore, requires less costly equipment✓/saves on labour costs.

OR

– As auxins are removed ✓
– There will be more lateral branches✓/lateral branches are longer
– they can carry more fruit ✓/higher yields.
– Therefore, more income from sales. ✓ Any (3)
(11)

2.4 2.4.1 Right ✓ side (1)

2.4.2 Decreased pupil size ✓

Drooping eyelid ✓

Decreased sweating ✓
(Mark first ONE only) Any (1)

2.4.3 Cerebrum ✓ (1)

2.4.4 Autonomic ✓ nervous system (1)

2.4.5 As pupil is too small it cannot dilate enough to let more light in ✓ there is a greater risk of having an accident at night ✓, because it will be difficult to see in the dark ✓/dim light. Any (2)

2.4.6

Adrenalin	**Parasympathetic nervous system**
increases heart rate✓	decreases heart rate✓
constricts blood vessels in the skin✓/vasoconstriction	dilates blood vessels in skin✓/vasodilation
dilates pupils✓	constricts pupils✓
increases blood pressure✓	decreases blood pressure✓
widens bronchioles✓	narrows bronchioles✓
decreases peristalsis✓	increases peristalsis✓
causes relaxation of the bladder wall✓	causes contraction of the bladder wall✓
stimulates sweat secretion✓	less sweat is secreted✓

(Mark first TWO only) Any (2 x 2) + 1 Table (5)

2.4.7 Accommodation ✓*
- Ciliary muscles contract ✓
- Suspensory ligaments slacken ✓
- Tension on the lens decreases ✓
- Lens becomes more convex ✓
- Increasing the refractive power of the lens ✓
- Forming a (clear) image on the retina ✓

Any (3 + 1* compulsory) (4)
(15)
[50]

QUESTION 3

3.1 3.1.1 Deepening of the voice ✓/larynx enlarges
Broadening of the chest ✓/shoulders
More muscular physique✓
Penis/testes/sex organs enlarge ✓
(Mark first TWO only) Any (2)

3.1.2 To determine the relationship between the density of beard growth and the concentration/level of testosterone. ✓✓

OR

To determine the effect of testosterone levels on beard density✓✓
(Must include "to" and both variables) (2)

3.1.3 All males should have the same:
- Age ✓
- Diet ✓
- Health ✓/level of activity
- Race ✓
- Environment ✓

(Mark first THREE only) Any (3)

3.1.4 $\frac{0,52+0,53+0,52+0,51+0,53}{5}$ ✓ OR $\frac{0,261}{5}$

= 0,522 ✓ µg ✓ (accept 0,52 or 0,5) (3)

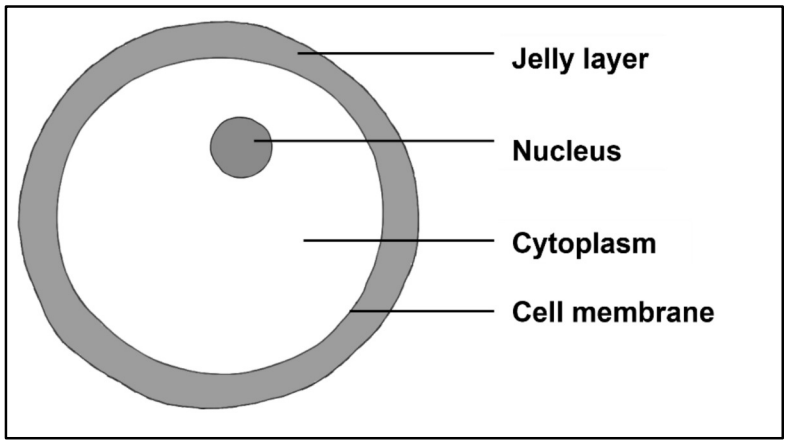
3.1.5 Rejected ✓* A greater density of beard growth was not shown to correspond with an increased testosterone level. ✓/Even when density of hair growth was more, testosterone levels remained similar.
(1* compulsory + 1) (2)
(12)

3.2 3.2.1 C – Primary follicle ✓ (1)

3.2.2 Ovarian ✓ cycle (1)

3.2.3 C; B; A ✓; E; D ✓
(Mark first FIVE only) (2)

3.2.4 Diagram of an ovum



Criteria	Elaboration	Symbol	Mark
Drawing	Correct representation of an ovum (single, round cell with a nucleus)	**D**	(1)
Labels	ANY correct labels as shown in the sketch above. • One correct label • Two correct labels	**L**	 (1) (2)
Caption	Structure identified as an ovum	**C**	(1)
		TOTAL	(4)

(4)

3.2.5 (a) FSH ✓ and LH ✓ (2)

(b) Oestrogen ✓ and progesterone ✓ (2)

3.2.6 – The degeneration of the corpus luteum✓
– leads to a decrease in progesterone.✓
– The endometrium is no longer maintained ✓/shed/menstruation occurs.
– Thus, FSH increases ✓ causing the next cycle to start. Any (3)
(15)

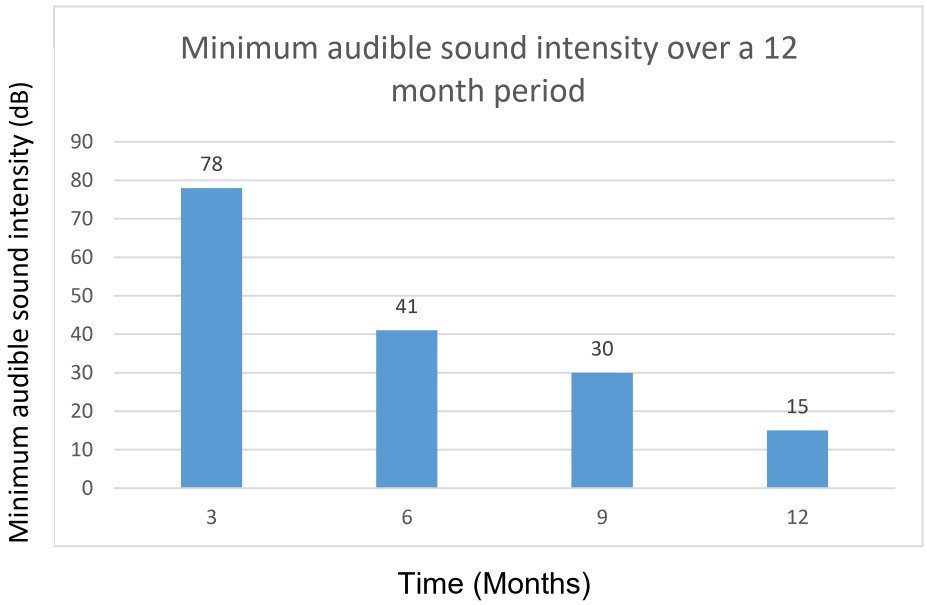
3.3 3.3.1 (a) Ossicles ✓ (1)

(b) Cochlea ✓ (1)

3.3.2
- Sound waves cannot be (effectively) converted to vibrations by the eardrum✓/tympanic membrane
- and the ossicles do not vibrate ✓/vibrate less
- therefore, the oval window does not vibrate ✓/vibrates less
- no/little pressure waves form✓ in the cochlea
- The Organ of Corti picks up little or no stimulus ✓
- and little or no impulse is carried by the auditory nerve ✓
- with little or no interpretation occurring in the cerebrum✓ Any (4)

3.3.3 The person can hear 15 dB ✓/normal dB range/0-25 dB range (1)

3.3.4



CRITERIA:

Guidelines for assessment of the graph	ELABORATION	MARK
Correct type of graph (**T**)	Bar graph drawn	1
Caption for graph (**C**)	Both variables included	1
Axes labels (**L**)	X- and Y-axis correctly labelled with units	1
Scale for X- and Y-axis (**S**)	Equal space and width of bars on X-axis AND Correct scale for Y-axis	1
Plotting of points (**P**)	1 to 3 co-ordinates plotted correctly All coordinates plotted correctly	1 2

(6)

(13)

3.4 3.4.1 (a) C ✓ (1)

(b) A ✓ (1)

(c) B ✓ (1)

3.4.2 The Eustachian tube ✓ allows air to move into and out of the middle ear. ✓ (2)

3.4.3
- Cristae ✓
- in the ampullae/semi-circular canals are stimulated ✓
- by a change in the speed and direction of the body✓/head
- the stimulus is converted into an impulse ✓
- the impulses are sent via the auditory nerve ✓
- to the cerebellum ✓
- the cerebellum then sends impulses to the skeletal muscles ✓ to restore the balance.

Any (5)
(10)
[50]

TOTAL SECTION B: 100

TOTAL: 150