GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PREPARATORY EXAMINATION

2020

MARKING GUIDELINES

LIFE SCIENCES (PAPER 1) (10831)

13 pages

PRINCIPLES RELATING TO THE MARKING OF LIFE SCIENCES

1. **If more information than marks allocated is given**
   Stop marking when maximum 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 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, provided it does not mean something else in Life Sciences or if it is out of context**.**

13. **If common names are given in the terminology**
Accept, provided it was accepted at the memo discussion meeting.

14. **If only the letter is asked for and only a 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 C✓✓

1.1.2 B✓✓

1.1.3 C✓✓

1.1.4 C✓✓

1.1.5 D✓✓

1.1.6 C✓✓

1.1.7 A✓✓

1.1.8 B✓✓

1.1.9 A✓✓

1.1.10 C✓✓

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

1.2 1.2.1 Monoculture✓

1.2.2 Blastula/blastocyst✓

1.2.3 Photoreceptors✓/Rods and cones

1.2.4 Glucagon✓

1.2.5 Poaching✓

1.2.6 Biodiversity✓

1.2.7 Amniotic✓ fluid

(7 x 1) **(7)**

1.3 1.3.1 A only✓✓

1.3.2 B only✓✓

1.3.3 NONE✓✓

(3 x 2) **(6)**

1.4	1.4.1	Phototropism✓		(1)
	1.4.2	Auxin✓		(1)
	1.4.3	B✓		(1)
	1.4.4	A✓		(1)
	1.4.5	Geotropism✓		(1)
	1.4.6	Root✓		(1)
	1.4.7	It (the shoot) would have grown straight.✓/It would not have bent towards the sunlight. **Mark first ONE only.**	(Any 1)	(1) **(7)**
1.5	1.5.1	A✓		(1)
	1.5.2	C✓		(1)
	1.5.3	A✓		(1)
	1.5.4	D✓		(1)
	1.5.5	B✓		(1) **(5)**
1.6	1.6.1	(a) Deforestation✓ (b) Overgrazing✓ (c) Mining✓		(3)
	1.6.2	Picture 1 – CO_2 ✓/Carbon Dioxide Picture 2 – CH_4 ✓/Methane		(2) **(5)**

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 Individual 1✓ (1)

2.1.2 He has the highest volume of urine produced per day.✓ (1)

2.1.3 It is an endocrine gland✓that secretes the hormone directly into the bloodstream. (1)

2.1.4 Average volume of urine produced ✓ (1)

2.1.5
- Volume of fluids the males consumed✓
- Type of fluids the males consumed✓/same diet
- Temperature of their environment✓
- The amount of physical activity ✓
- Time interval of the measurement ✓
- Method of measurement ✓
- Person doing the measurement ✓

Mark first TWO only. (Any 2 x 1) (2)

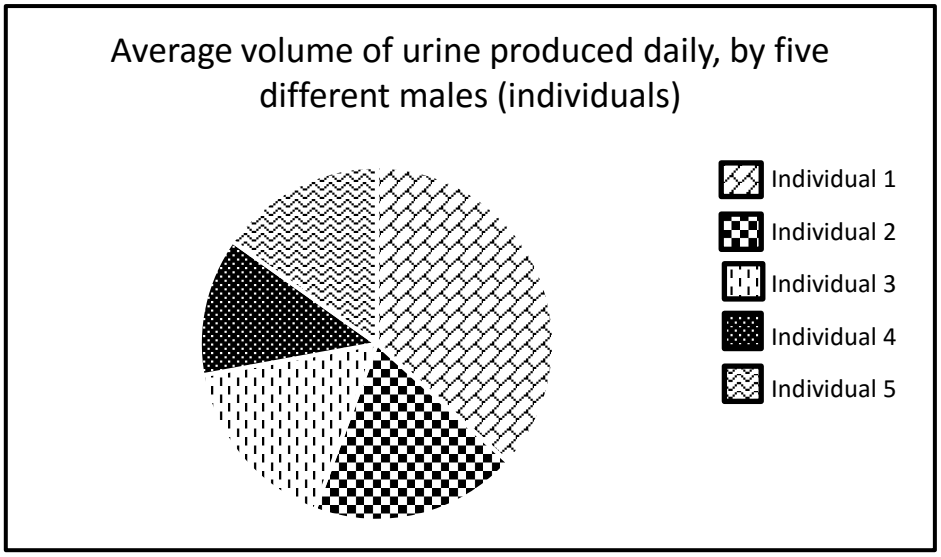
2.1.6
- Ensure that gloves are worn when working with urine samples.✓
- Ensure that participants' health is being monitored by a doctor.✓
- Ensure that participants are provided with sufficient food and water.✓

Mark first ONE only. (Any 1) (1)

2.1.7
- They conducted the investigation over 30 days✓
- They calculated the average daily urine production✓ (2)

2.1.8 Calculations: 2,9 + 1,5 + 1,3 + 1,0 + 1,2 = 7,9

Individual 1: 2,9 ÷ 7,9 × 360 = 132º
Individual 2: 1,5 ÷ 7,9 × 360 = 68º
Individual 3: 1,3 ÷ 7,9 × 360 = 59º
Individual 4: 1,0 ÷ 7,9 × 360 = 46º
Individual 5: 1,2 ÷ 7,9 × 360 = 55º



Rubric for assessment of the graph

Correct type of graph **(T)**	**1**
Correct caption including both variables **(C)**	**1**
All 5 Sectors correctly indicated/labelled/key **(L)**	**1**
1 – 4 Sectors correctly calculated All 5 Sectors correctly calculated **(S)**	**1** **2**
All 5 Sectors correctly drawn **(D)**	**1**
TOTAL	**6**

(6)
(15)

2.2 2.2.1 It produces an alkaline fluid.✓ (1)

2.2.2 (a) Oestrogen✓/progesterone
(b) Testosterone ✓ (2)

2.2.3

Structure C/Female Urethra	Structure E/Male Urethra
Transports urine only ✓	Transports urine and semen ✓
Located inside the abdomen only✓	Located inside the abdomen and outside in the penis ✓
Straight tube✓	Curved tube ✓
Short tube✓	Long tube ✓
Connects urinary system to the exterior of the body ✓	Connects urinary and reproductive systems to the exterior of the body ✓

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

2.2.4
- Its muscular myometrium✓ allows for contractions during labour.✓
- It is elastic and can stretch✓ to accommodate the growing foetus. ✓
- The inner lining/endometrium has many capillaries✓ which help to form the placenta. ✓

Mark first TWO only. (Any 2 x 2) (4)

2.2.5
- When the vas deferens is tied or sealed
- sperm are prevented from entering the urethra✓
- therefore, no fertilization will take place✓ as there are no sperm cells in semen ✓

Mark first TWO only. (Any 2) (2)

(14)

2.3 2.3.1 A – Centriole✓/Centrosome
B – Cell membrane✓/plasmalemma/plasma membrane
C – Unreplicated/Single stranded chromosome✓ (3)

2.3.2 Oogenesis✓ (1)

2.3.3 Diagram 3 ✓ (1)

2.3.4
- Crossing-over✓*
- Adjacent chromatids ✓
- of homologous chromosomes cross✓
- at a point called the chiasma ✓
- There is an exchange of DNA segments ✓/genetic material

(1 Compulsory* + Any 3) (4)

2.3.5 (a) 23✓/twenty three
(b) 46✓/forty six (2)

(11)

[40]

QUESTION 3

3.1 3.1.1 A – Malleus ✓/Hammer
C – Cochlea✓ (2)

3.1.2 Antibiotics✓/Grommet
Mark first ONE only (A (1)

3.1.3
- If the vestibular part/Part B of the auditory nerve✓ is damaged,
- no impulse will be sent to the cerebellum for interpretation✓,
- therefore, the person will not be able to maintain their balance✓*
- as the cochlea part/other part of the auditory nerve✓
- is not damaged✓
- an impulse will still be able to be sent to the cerebrum for interpretation, ✓
- therefore, the person can still hear✓*

(2 Compulsory* + Any 2) (4)
(7)

3.2 3.2.1 Chemical control ✓ (1)

3.2.2 Mechanical✓/Biological control
Mark first ONE only (Any 1) (1)

3.2.3 (a) Access to enough, healthy food for all people at all times✓✓ (2)
(b) Plants that do not naturally occur in an area and threaten indigenous plants/crops✓✓ (2)

3.2.4 (a)

– Pests become resistant to pesticides✓, increasing their numbers✓

OR

– Pesticides can damage the plant tissues of crops✓/kill useful insects or pollinators
– This reduces crop yields/decreased availability of food✓

OR

– Pesticides are expensive, ✓
– This increases the cost of food/decreased access to food✓

OR

– Chemicals in pesticides can cause illnesses in humans,✓
– This means that food is no longer healthy/safe to eat✓

Mark first ONE only. (Any 1 x 2) (2)

(b)

– Pesticides can be passed on through the food chain✓/bioaccumulation can occur,
– causing other organisms to die ✓

OR

– Pesticides can damage the plant tissues of many other species of plants, ✓
– causing them to die✓

OR

– Pesticides can run off into rivers and dams, ✓
– killing aquatic organisms. ✓

Mark first ONE only. **(**Any 1 x 2) (2)

3.2.5 – GMOs are more pest resistant✓
– therefore, crop yields will be higher✓
– reducing the need for pesticides✓

OR

– Pests are becoming more resistant to GMOs✓
– therefore, crop yields will be lower✓
– increasing the need for pesticides✓ (3)

(13)

3.3 3.3.1 (45 - 40)/5 ÷ 40✓ × 100✓ = 12,5✓% (3)

3.3.2 Myelin sheath✓ (1)

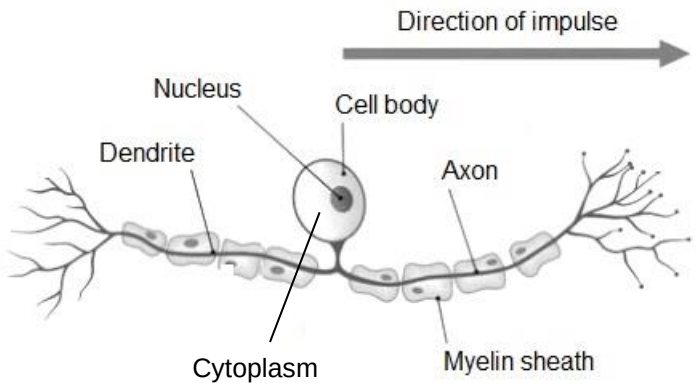
3.3.3 The wider/broader the neuron the faster the reflex action would be. ✓✓

OR

The narrower/thinner the neuron the slower the reflex action would be. ✓✓ (2)

3.3.4 Synapse✓/Synaptic gap (1)

3.3.5 Sensory neuron showing the direction of impulse



Rubric for assessment of the diagram

Correct type of neuron drawn **(T)**	**1**
Direction of impulse correct **(D)**	**1**
ANY 3 correct labels **(L)**	**3**
TOTAL	**5**

(5)

(12)

3.4 3.4.1 C – Sclera✓*

– it protects internal/underlying structures of the eye✓/it is a place for the attachment of muscles that move the eye/it helps maintain the shape of the eye.

Mark first ONE only. (1 compulsory* +1) (2)

3.4.2
– In dimmer light/walking into the house
– the circular muscles of the iris/part B relax✓
– the radial muscles of the iris/part B contract✓
– the diameter of the pupil/part A increases✓
– allowing more light to enter the eye.✓ (4)

3.4.3
– The pupil will react slowly to the light ✓/will not react immediately.
– as alcohol inhibits autonomic actions✓/as the impulse reaches the brain more slowly and therefore constriction will occur slowly. (2)

(8)

[40]

TOTAL SECTION B: 80

SECTION C

QUESTION 4

Menstrual cycle (M)

- Due to the Corpus Luteum disintegrating✓
- Progesterone levels✓
- decrease✓
- in the blood✓
- therefore, the lining of the Endometrium is shed✓/cannot be maintained.
- At the same time FSH is secreted✓
- by the pituitary gland✓/hypophysis.
- FSH stimulates the development of a primary follicle✓
- into a mature Graafian follicle✓in the ovary.
- The Graafian follicle secretes oestrogen✓
- which stimulates thickening of the endometrial tissue.✓
- A peak in oestrogen stimulates✓
- the secretion of LH✓ by the pituitary gland/hypophysis
- which causes the Graafian follicle to rupture✓
- and release an ovum.✓ (Any 12) (12)

Thermoregulation (T)

- The blood vessels in the skin dilate✓/vasodilation occurs
- **More** blood flows beneath the skin surface.✓
- **More** heat is radiated✓/lost from the skin surface.
- **More** blood flows to sweat glands.✓
- Sweat glands become **more** active.✓
- **More** sweat is released.✓
- **More** evaporative cooling occurs.✓ (Any 5) (5)

Content: (17)
Synthesis: (3)

NOTE: NO marks will be awarded for answers in the form of a table, flow charts or diagrams.

ASSESSING THE PRESENTATION OF THE ESSAY

Criterion	Relevance (R)	Logical sequence (L)	Comprehensive (C)
Generally	All information provided is relevant to the topic.	Ideas are arranged in a logical/cause-effect sequence.	All aspects required by the essay have been sufficiently addressed.
In this essay	Only information relevant to - Menstrual cycle - Thermoregulation	Ideas are in a logical sequence in each of the following: - Complete cycle - Thermoregulation	Obtained at least the following: - Menstrual cycle (**9/12**) - Thermoregulation(**3/5**)
Mark	1	1	1

TOTAL SECTION C: 20
TOTAL: 150