GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PREPARATORY EXAMINATION

2018

MARKING GUIDELINES

LIFE SCIENCES (PAPER 1) (10831)

11 pages

GAUTENG DEPARTMENT OF EDUCATION

PREPARATORY EXAMINATION

LIFE SCIENCES
(Paper 1)

MARKING GUIDELINES

PRINCIPLES RELATING TO THE MARKING OF LIFE SCIENCES

1. **If more information than marks allocated is given.**
   Stop marking when maximum mark 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 the whole process is given when only part of it is required.**
   Read all and credit relevant parts.
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-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 are 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).**
    Do not 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 captions.
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 memorandum.**
    No changes may be made to the ratified memorandum without consultation with the Provincial Internal Moderator.

SECTION A
QUESTION 1

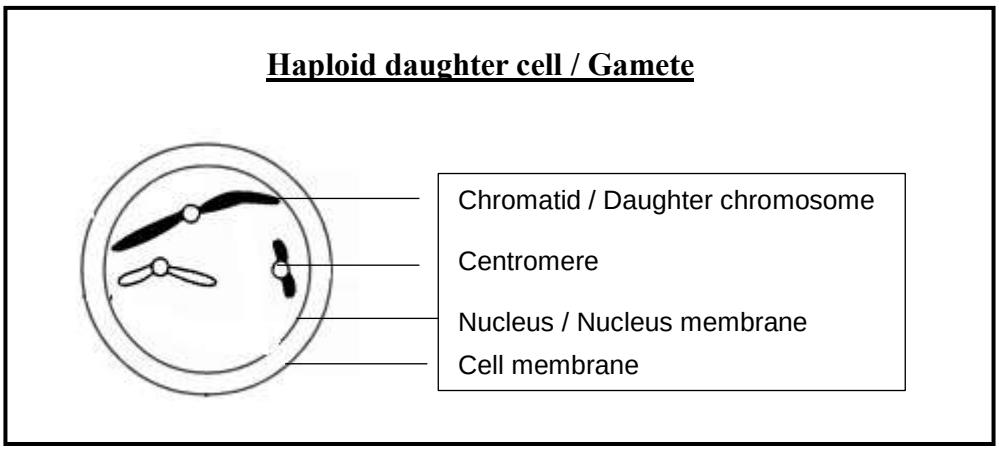
1.1	1.1.1	A✓✓		
	1.1.2	A✓✓		
	1.1.3	C✓✓		
	1.1.4	B✓✓		
	1.1.5	D✓✓		
	1.1.6	B✓✓		
	1.1.7	B✓✓		
	1.1.8	A✓✓		
	1.1.9	C✓✓		
	1.1.10	C✓✓		
			(10 x 2)	**(20)**
1.2	1.2.1	Chorion ✓		
	1.2.2	Prolactin ✓		
	1.2.3	Hypothalamus ✓		
	1.2.4	Fossil fuels ✓		
	1.2.5	Carbon footprint ✓		
	1.2.6	Methane ✓		
	1.2.7	Aldosterone✓		
			(7 x 1)	**(7)**
1.3	1.3.1	A only ✓✓		(2)
	1.3.2	B only ✓✓		(2)
	1.3.3	B only ✓✓		(2)
	1.3.4	None ✓✓		(2**)**
	1.3.5	B only✓✓		(2)
	1.3.6	B only✓✓		(2)
				(12)
1.4	1.4.1	(i) C ✓ (ii) B ✓ (iii) D ✓		(3)
	1.4.2	Growth hormone✓ TSH / Thyroid stimulating hormone✓ FSH / Follicle stimulating hormone ✓ LH / Luteinising hormone✓ Prolactin✓ **Mark first TWO only**		(2)
				(5)
1.5	1.5.1	Negative feedback ✓ mechanism		(1)
	1.5.2	1 – decrease ✓ 2 – pituitary✓ 3 – TSH✓ 4 – thyroid✓ 5 – more✓		(5)
				(6)
			TOTAL SECTION A:	**50**

SECTION B
QUESTION 2

2.1 2.1.1 (i) 6 chromosomes ✓
(ii) 3 chromosomes ✓ (2)

2.1.2 Ovary✓ / testes / gonads (1)

2.1.3



Rubric for assessment of the diagram:

Caption for diagram	1
Correct number of chromatids present	1
Any TWO correct labels	2
	4

(4)

2.1.4 It introduces genetic variation✓

It balances the doubling effect of fertilisation as it halves the number of chromosomes in the sex cells. ✓ (2)
(9)

2.2 2.2.1 To ensure a lower temperature✓ which is best for sperm production. ✓ (Regulates temperature) (2)

2.2.2 Development of male secondary sexual characteristics ✓
Stimulates the maturation of sperm cells✓ (2)
(4)

2.3 2.3.1

	Sperm cell	**Ovum**
Size	- Very small✓	- Larger in size✓
Structure	- Head, middle piece, tail - Nucleus containing father's genetic material - Has a tail✓ - No jelly coat surrounds head - Acrosome present	- Round - Nucleus containing mother's genetic material - Has no tail✓ - Jelly coat surrounds cell membrane - No acrosome
Motility	- Can move because of the tail	- Can't move on its own

Mark any **TWO** ✓✓ (3)
1 mark for table✓

2.3.2 The enzymes digest the outer coat of the ovum ✓to enable the head to penetrate the ovum and the nuclei to fuse. ✓ (2)

2.3.3 20 cm = 200 mm✓ 200 mm /4 ✓=50 It will take 50 minutes ✓ (3)

2.3.4 The urethra is cleaned prior to ejaculation✓ by secretions from the Cowper's gland. ✓ (2)
(10)

2.4 2.4.1 (i) Oestrogen✓ (1)
(ii) It increases the thickness of the endometrium✓ (1)
(iii) Provides a place where the embryo implants✓ and the placenta forms ✓ (2)

2.4.2 (i) LH / Luteinising hormone ✓ (1)
(ii) It is produced to burst the Graafian follicle ✓to release the ovum / stimulate ovulation ✓
Stimulates the development of the corpus luteum ✓ **ANY 2** (2)

2.4.3 Corpus luteum is degenerating / getting smaller ✓
The lining of the endometrium is decreasing in size/ getting thinner ✓ (2)
(9)

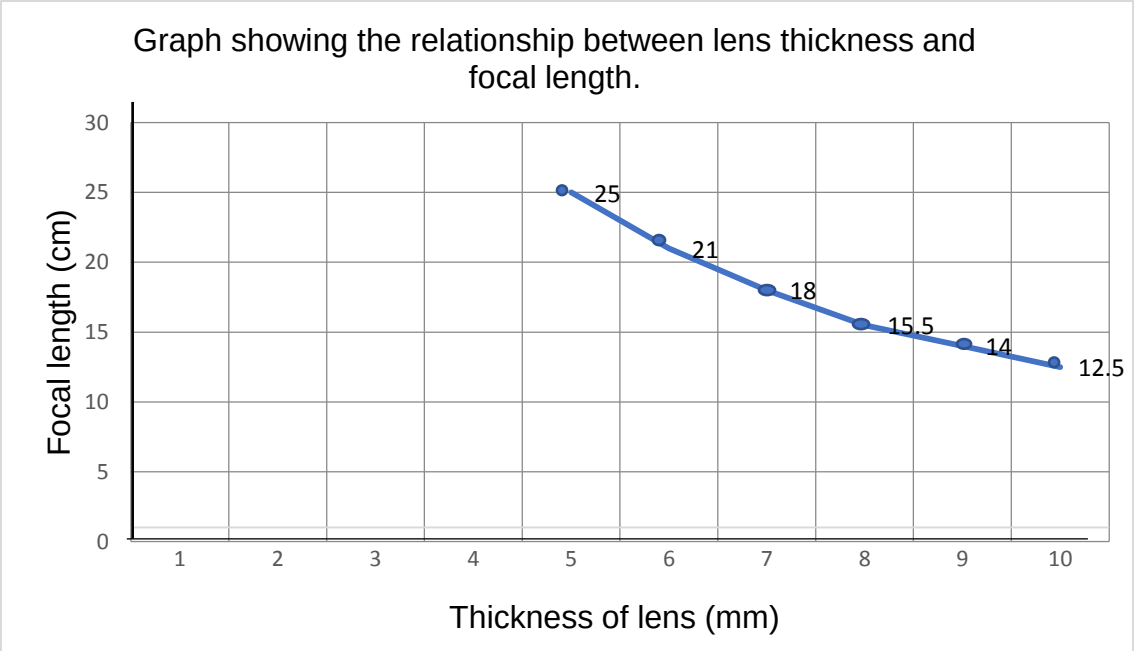
2.5	2.5.1	Stimulates the conversion of glucose to glycogen ✓/ reduces the blood glucose levels✓	(1)
	2.5.2	13:00 ✓	(1)
	2.5.3	28 / 29 mμ/ℓ ✓ (Units must be included for mark to be awarded)	(1)
	2.5.4	Blood glucose level increases after a meal is eaten ✓ Pancreas is stimulated to secrete insulin into blood ✓ Insulin travels in the blood to the liver ✓ Stimulates conversion of excess glucose to glycogen ✓ Glycogen is stored ✓ Glucose levels in the blood now decreases ✓ and returns back to normal **ANY 5**	(5) **(8)** **[40]**

QUESTION 3

3.1 3.1.1 There are no photoreceptors present ✓/ no rods and cones, therefore no vision is detected as the optic nerve is situated in this region ✓ (2)

3.1.2 The A / suspensory ligaments slacken ✓, the tension on the B / lens decreases, ✓ the B / lens becomes more convex✓/ more rounded / bulges. The refractive power of the B / lens is increased. (3)

3.1.3 Graph



Rubric for assessment of the graph:

Correct type of graph (line graph)	1
Caption for graph	1
Correct label for X-axis (including unit) AND scale for X-axis	1
Correct label for Y-axis (including unit) AND scale for Y-axis	1
Plotting: 1 to 2 points correct All 6 points correct	 1 2
	6

(6)

Note
If the wrong graph is drawn, marks will be lost for "correct type of graph".
If axes are transposed, marks will be lost for labelling of X-axis and Y-axis.

3.1.4 As the thickness of the lens increases ✓ the focal length decreases ✓ (2)

3.1.5 **Pupillary mechanism / pupil reflex** ✓
Radial muscles ✓of the iris contract✓
Circular muscles ✓of the iris relax✓
Pupil dilates✓ / widens / gets bigger ✓ and more light enters the eye
*** Compulsory mark +ANY 4** (5)
(18)

3.2 3.2.1 A – (external) auditory canal / auditory canal / ear canal / meatus ✓
B – tympanic membrane / eardrum ✓
D – oval window ✓ (3)

3.2.2 C – transmits vibrations from the eardrum to the incus ✓
E – transmits impulses to the brain ✓ (2)

3.2.3 (a) Traps dust✓
Prevents insects / small animals from entering the ear✓
Keeps eardrum moist✓
Mark FIRST TWO only (2)

(b) Hearing will worsen / deafness ✓may result because plug will hamper free movement/ vibrations of tympanic membrane ✓
Hearing will weaken / no sound waves will be transferred ✓
Plug will limit sound waves entering the tympanic membrane / eardrum (3)
(10)

3.3 3.3.1 Hot / warm ✓ (1)

3.3.2 Capillaries are dilated ✓/ vasodilation
Sweat glands producing / secreting sweat ✓ (2)
(3)

3.4 3.4.1 (a) Presence of the shoot tip containing the hormone✓
(b) growth of the shoot✓ (2)

3.4.2 The shoot tip produces a hormone called auxin✓
This hormone stimulates cell division and cell elongation,✓
resulting in the growth of the shoot ✓
If the tip is removed no growth occurs ✓due to the lack of auxin ✓

ANY 4 (4)

3.4.3 Repeat the investigation several times✓
Increase sample size✓

Mark first ONE only (1)

3.4.4 Use same type / species of plant✓
Use same soil in the pots✓
Same amount of water given when watering shoots✓
Same environmental conditions✓/ sunlight / humidity
Same nutrients✓

ANY 2
Mark FIRST TWO only (2)
(9)
[40]

TOTAL SECTION B: 80

SECTION C

QUESTION 4

Define:
Food security refers to the access, by all people at all times, to adequate, safe and nutritious food for a healthy and productive life. ✓

Max 1 mark

Poor Farming techniques:
Monoculture is the growing of one type of crop over large areas of land year after year.✓
Monoculture depletes nutrients and water supplies ✓and therefore impacts negatively on the quality of the topsoil. ✓

Pest control involves the use of pesticides (chemicals) to kill pests ✓that compete with humans for food. ✓
Pesticides may kill or get into the tissues of healthy plants. ✓
This may reduce crop production and, since pesticides are expensive, ✓increase the cost of food and thus reduce access to poor consumers ✓ thus reducing food security.

Topsoil: The tilling of the soil between plantings and heavy rainfall are the cause of much of the topsoil to be lost, ✓leading to the loss of valuable nutrients over time, ✓ reducing crop yields ✓ thus reducing food security.

Use of fertilizers: Fertilizers can be expensive, ✓contributing to the high cost of food, thus reducing access to poor consumers ✓ thus reducing food security.

Max 10 marks

Alien plants:
Alien plants deplete the topsoil of water and nutrients. ✓
These alien plants out-compete indigenous plants because they have no natural predators, ✓grow rapidly and invade land that could be used to grow crops ✓ thus reducing food security.

Max 2 marks

Climate change:
Climate change leads to more frequent and severe droughts and floods. ✓
Droughts result in crop losses and livestock deaths ✓which reduces the food available in an area. ✓
Floods cause extensive damage in a short period of time and decreases the amount of farmland available to grow crops ✓ thus reducing food security.
People also usually lose their homes, possessions and economic security during floods,✓ a further negative impact on food security. ✓

Max 4 marks

ASSESSING THE PRESENTATION OF THE ESSAY

Criterion	Relevance (R)	Logical sequence (L)	Comprehensive (C)
Generally	All information provided is relevant to the question	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 food security: - define - poor farming - alien plants - climate change There is no irrelevant information	All the information regarding the description of food security: - definition - poor farming - alien plants - climate change is given in a logical manner	Correct points as follows: - definition (1) - poor farming (7/10) - alien plants (1/2) - climate change (2/4)
Mark	1	1	1

TOTAL SECTION C: 20

TOTAL: 150