

GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PREPARATORY EXAMINATION 2022



MARKING GUIDELINES

LIFE SCIENCES PAPER 1 (10831)

12 pages + notes + a mark conversion table

PRINCIPLES RELATING TO THE MARKING OF LIFE SCIENCES

1. **If more information than marks allocated is given**
   Stop marking when maximum number of marks are 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 the answer is 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 D✓✓

1.1.2 A✓✓

1.1.3 A✓✓

1.1.4 B✓✓

1.1.5 **The question is not valid and therefore no marks are allocated.**

1.1.6 C✓✓

1.1.7 C✓✓



1.1.8 C✓✓

1.1.9 A✓✓

1.1.10 B✓✓

(9 x 2) **(18)**

1.2 1.2.1 Umbilical cord✓

1.2.2 Endocrine✓glands

1.2.3 Inter✓/connector neurons

1.2.4 Cerebrospinal✓fluid

1.2.5 Cell body✓

(5 x 1) **(5)**

1.3 1.3.1 Both A and B✓✓

1.3.2 Both A and B✓✓

1.3.3 Both A and B✓✓

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

1.4	1.4.1	B – Sclera✓ G – Iris✓ I – Cornea✓		(3)
	1.4.2	(a)	H✓ – Pupil✓	(2)
		(b)	F✓ – Optic nerve✓	(2)
		(c)	A✓ – Eyelid✓	(2)
	1.4.3	(a)	It contracts✓	(1)
		(b)	It slackens✓/loosens	(1)
		(c)	Becomes more convex✓/more rounded	(1)
	1.4.4	(a)	Concave lenses✓/ Concave Glasses/(Laser) surgery	(1)
		(b)	Surgery✓/synthetic lens	(1)
				(14)
1.5	1.5.1	(a)	A, B, and C✓ (only accept if all three are correct)	(1)
		(b)	D and E✓(only accept if both are correct)	(1)
	1.5.2	(a)	Prostate✓ gland	(1)
		(b)	Testosterone✓	(1)
	1.5.3	Temperature✓		(1)
				(5)

TOTAL SECTION A: 48



SECTION B

QUESTION 2

2.1 2.1.1 20 mm✓ (1)

2.1.2 $\frac{18,8 - 13,3}{13,3}$ **OR** $\frac{5,5}{13,3}$ ✓ x 100✓
= 41,35✓/41/41,4% (3)

2.1.3 II – Corpus luteum✓
III – Graafian✓ follicle (2)

2.1.4 A matches I✓/I matches A
B matches III✓/III matches B
C matches II✓/II matches C (3)

2.1.5 – As the diameter of the follicle decreases✓/corpus luteum disintegrates,
– less progesterone is released✓/progesterone levels decrease,
– The endometrium is not maintained✓
– causing menstruation to occur✓/causing endometrium to be shed.
(Any 3) (3)
(12)



2.2 2.2.1 I – Morula✓
III – Blastocyst✓/blastula (2)

2.2.2 – Sperm cell's nucleus✓ enters the ovum and
– fuses with the ovum's nucleus✓
– to form the zygote✓/diploid nucleus of this cell.
} **OR** fertilization✓

OR

– **Haploid sperm** cell✓
– fuses with the **haploid ovum**✓
– to form the zygote✓/diploid nucleus of this cell.
} **OR** fertilization✓

(3)

2.2.3

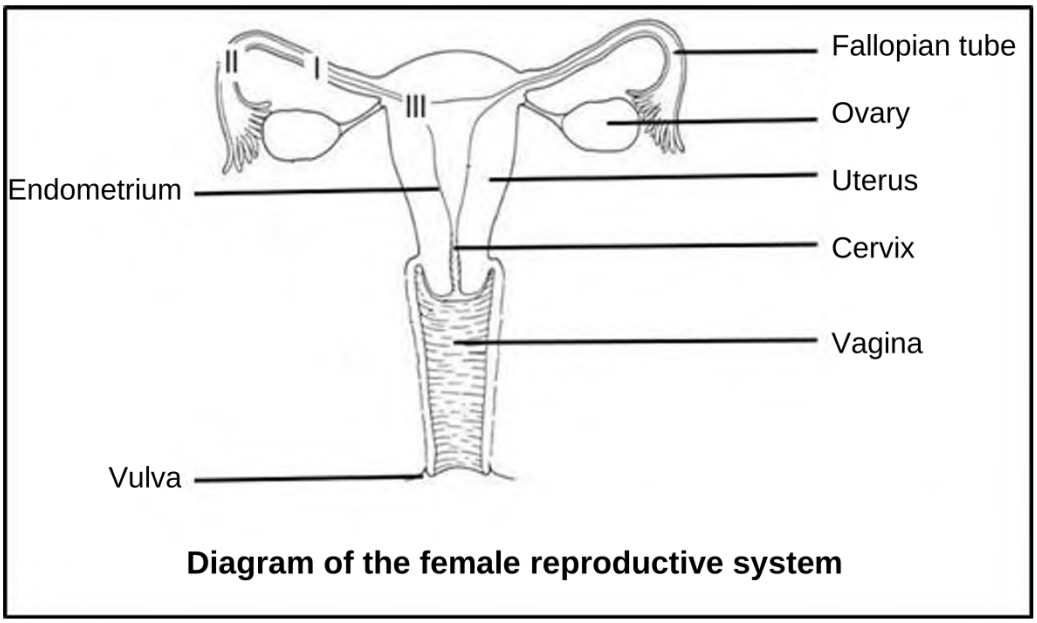


Diagram of the female reproductive system

Criteria for assessing diagram:

CRITERIA	**SYMBOL**	MARKS
Correct caption	**(C)**	1
Diagram accuracy (front view and fallopian tubes attached to uterus)	**(D)**	1
Any TWO correct labels	**(L)**	2
Numbers positioned in the fallopian tube and uterus and order is correct (Precise location not necessary)	**(P)**	1

(5)
(10)

2.3 2.3.1

(a) Increased surface area✓ for cellular respiration✓ to provide energy✓ (Any 2) (2)

(b) Contains enzymes✓ to dissolve the outer membrane of the ovum✓ for the (sperm cell) nucleus to enter the ovum✓/ for fertilization (Any 2) (2)

2.3.2

Gametogenesis in males	**Gametogenesis in females**
Called spermatogenesis✓	Called oogenesis✓
Stimulated by testosterone✓	Stimulated by FSH✓
Takes place in the testes✓/ seminiferous tubules	Takes place in the ovaries✓/follicles
Results in 4 sperm cells being produced✓	Results in 1 ovum being produced✓
Process starts at puberty✓	The process starts before puberty✓/at birth

Mark first TWO only Any (2 x 2) + 1 table (5)
(9)

2.4 2.4.1 Internal✓ fertilization (1)

2.4.2 Oviparity✓/Ovipary (1)

2.4.3 Altricial✓ (1)

2.4.4
- Protects the foetus against shock✓/mechanical injuries
- Keeps the foetus moist✓/Protects the foetus from drying out
- Protects the foetus from temperature changes✓
- Allows the foetus to move freely✓/Supports the body of the foetus during development

Mark first TWO only (Any 2) (2)

2.4.5
- The yolk sac was smaller✓
- Therefore, (the chick) it received less nutrients✓ in the form of yolk
- (The chick) it is less developed✓/underdeveloped/eyes are closed/has only down feathers/has no feathers/cannot walk/shows altricial development (3)

(8)

2.5 2.5.1 Thyroxin✓ (1)

2.5.2 Regulates the rate of:
- Respiration✓/energy production
- Energy consumption✓/metabolism
- Heat production✓
- Heart rate✓

Mark first TWO only (Any 2) (2)

2.5.3
- Fat✓
- (Muscle) protein✓

Mark first ONE only (Any 1) (1)

2.5.4 Glycogen✓ (1)

2.5.5
- Blood glucose level decreased below normal✓
- The pancreas/islets of Langerhans will be stimulated✓
- Glucagon is secreted✓
- which is transported via blood✓
- to the liver✓
- and muscle cells✓
- which converts glycogen✓ into glucose
- increasing blood glucose levels✓ to normal (Any 6) (6)

(11)

[50]

QUESTION 3

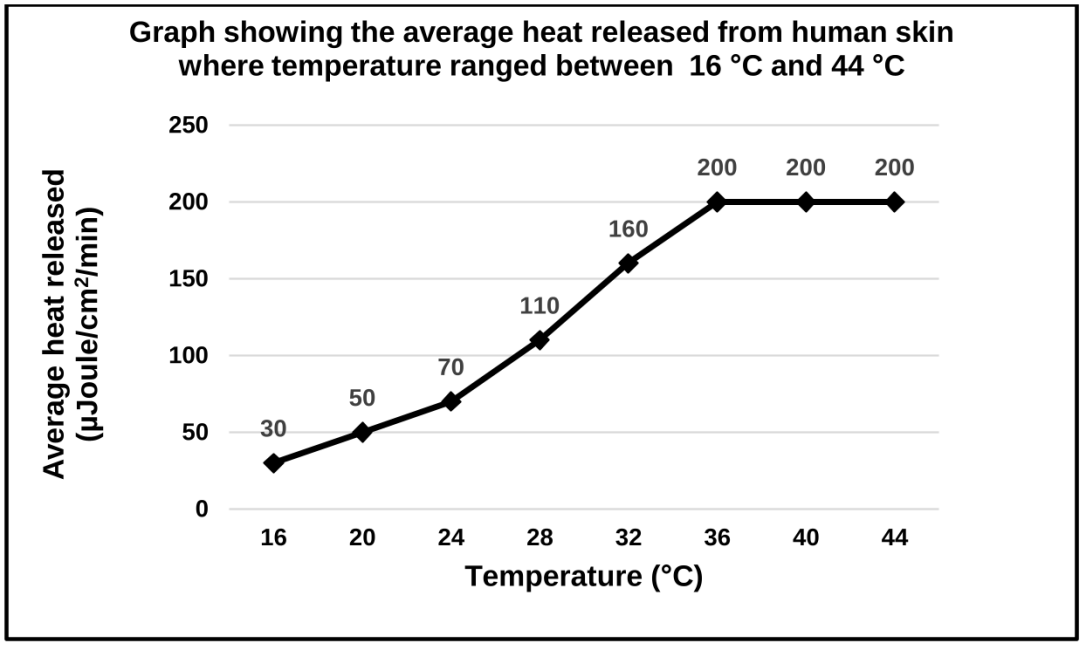
3.1 3.1.1 Thermoregulation✓ (1)

3.1.2
- As the environmental temperature increases
- the hypothalamus is stimulated✓
- and sends impulses to the blood vessels✓ of the skin
- Blood vessels dilate✓/blood vessels become wider/vasodilation occurs
- More blood flows to the surface of the skin✓
- More heat radiates from the skin✓
- (So average heat released/lost increases) (Any 3) (3)

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3.1.3
- As the environmental temperature increases above/beyond body temperature✓
- the average heat released/lost through radiation reaches its maximum✓/levels out/no gradient for radiation of heat
- therefore, increased sweating will occur ✓/sweat glands become more active
- As the sweat is evaporated✓
- it allows the body temperature to decrease✓/more cooling of the skin will occur (Any 4) (4)

3.1.4



Criteria for assessment of the graph

CRITERIA	ELABORATION	SYMBOL	MARKS
Correct type of graph	Line graph drawn	**(T)**	1
Caption of graph	Both variables included (Heat released AND temperature)	**(C)**	1
Axes labels	Correct label and unit for X- and Y-axes	**(L)**	1
Scale of X- and Y-axes	Equal spacing and correct scaling on X-axis and Y-axis	**(S)**	1
Plotting of points	1 to 7 points plotted correctly All 8 points plotted correctly	**(P)**	1 2

(6)
(14)

3.2 3.2.1 Gravity✓ (1)

3.2.2 Geotropism✓ (1)

3.2.3 Auxins✓ (1)

3.2.4
- More hormones/Auxins accumulated/higher concentration on the lower part of the stem✓
- causing more growth✓/elongation on this side
- fewer hormones/Auxins accumulated on the upper part of the stem✓
- causing less growth✓/elongation on this side
- (causing the stem to bend/grow upwards) (4)

3.2.5
- The leaves of the stem will receive more sunlight✓/face the sunlight
- for more photosynthesis✓

OR

- Exposes the flowers more favourably✓
- for pollination✓/seed dispersal

Mark first ONE only Any (1 x 2) (2)
(9)

3.3 3.3.1

- Sound waves are trapped by the pinna✓
- then directed into the auditory canal✓
- until they reach the tympanic membrane✓
- which vibrates✓
- passing vibrations to the ossicles✓ (accept if ALL 3 ossicles are named in the correct order)
- Amplification occurs in the middle ear✓
- The vibrations are transferred to the oval window✓
- This brings about pressure waves in the fluid✓/perilymph/ endolymph
- in the cochlea✓
- These are picked up by the organ of Corti✓
- which converts the stimulus into an impulse✓
- The impulse is carried by the auditory nerve✓
- to the cerebrum✓ where it is interpreted (Any 7) (7)

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3.3.2

Structure: The semi-circular canals are surrounded by bone✓
Suitability: Which provides strength✓/protection

Structure: The semi-circular canals are hollow✓
Suitability: Which holds fluid✓

Structure: They are filled with fluid (endolymph)✓
Suitability: Which acts as a stimulus when it moves✓

Structure: They are situated in 3 different directions✓/planes/at 90° to each other
Suitability: Which allows fluid movement with any change in the speed or direction of the body✓

Structure: They have swellings at the base✓/ampulla
Suitability: Contains receptors/cristae✓/Protects receptors/cristae

Structure: Contain receptors/cristae✓
Suitability: Which pick up fluid movement✓/stimulus/change in speed or direction of the body/Which converts stimuli into impulses

Mark first TWO only Any (2 x 2) (4)
(11)

3.4 3.4.1 E ✓ (1)

3.4.2

- (When a salty liquid/stimulus is placed on the tongue)
- receptors/taste buds pick up the stimulus✓
- the stimulus is converted to an impulse✓
- The impulse is carried by the sensory neuron✓
- to the cerebrum✓ where it is interpreted (Any 3) (3)

3.4.3 Amount of taste recovered✓ (1)

3.4.4 The same:
- Liquid used✓/ solvent /water used for each sample
- Volume of water✓/500 ml in samples
- Solute used✓/salt used
- Number of drops✓/3 drops applied
- Method of recording✓/placing an X
- Number of participants per duration✓
- Differences of durations✓/2-week intervals/5 min between drops

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

3.4.5 The greater the time after infection, the more taste is recovered✓✓

OR

As the duration since infection increased, the greater the number of samples that can be tasted✓✓

OR

The shorter the time after infection, the less taste is recovered✓✓ (2)

3.4.6 Rethabile✓
Martinus✓ (2)

3.4.7 Since they have not had COVID-19✓ (1)

3.4.8
- The reliability is not affected✓
- Since the number of participants/sample size remains the same✓/ the investigation was not repeated

OR

- The reliability increases✓
- Since the average result obtained increases✓/closer representation of trend

- The validity of the investigation is unaffected✓
- Since the controlled variables (example of) put in place remain unchanged✓

OR

- The validity of the investigation is increased✓
- Since Given's results were clearly inaccurate/incorrect✓/he claimed to taste salt in plain water/he claimed he could taste salt in the water that contained 2 teaspoons of salt but not in the water that contained 3 or 4 teaspoons of salt (Any 2 x 2) (4)

(16)

[50]



TOTAL SECTION B: [100]

TOTAL: 148

ADDITIONAL GUIDELINES ON MARKING

In general, remember that we are marking concepts and not words. Avoid looking for key words and marking them correct. Check that the entire response/sentence is scientifically correct.

Q 3.1.4 If axes are transposed, the learner will only be penalized for labelling the axes if the other aspects are correct.

If a bar graph is drawn, the learner will lose the marks for type (T) AND plotting (P).

Q 3.3.2 One mark can be awarded for a correct structure if there is no suitability. However, a mark cannot be awarded for the correct suitability if not linked to a correct structure.

MARK CONVERSION TABLE

Learner total (148)	Converted mark (150)
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	38

Learner total (148)	Converted mark (150)
38	39
39	40
40	41
41	42
42	43
43	44
44	45
45	46
46	47
47	48
48	49
49	50
50	51
51	52
52	53
53	54
54	55
55	56
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58	59
59	60
60	61
61	62
62	63
63	64
64	65
65	66
66	67
67	68
68	69
69	70
70	71
71	72
72	73
73	74
74	75

Learner total (148)	Converted mark (150)
75	76
76	77
77	78
78	79
79	80
80	81
81	82
82	83
83	84
84	85
85	86
86	87
87	88
88	89
89	90
90	91
91	92
92	93
93	94
94	95
95	96
96	97
97	98
98	99
99	100
100	101
101	102
102	103
103	104
104	105
105	106
106	107
107	108
108	109
109	110
110	111
111	113

Learner total (148)	Converted mark (150)
112	114
113	115
114	116
115	117
116	118
117	119
118	120
119	121
120	122
121	123
122	124
123	125
124	126
125	127
126	128
127	129
128	130
129	131
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142	144
143	145
144	146
145	147
146	148
147	149
148	150