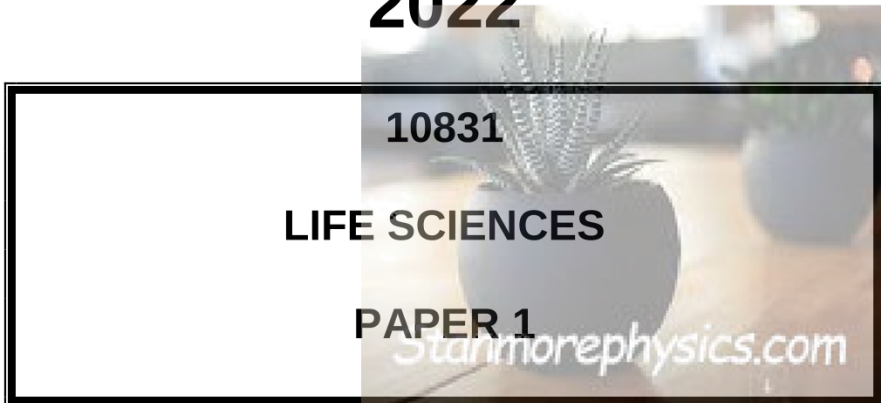




GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PREPARATORY EXAMINATION

2022



TIME: 2½ hours

MARKS: 150

LIFE SCIENCES: Paper 1



10831E

17 pages



X05



INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions in the ANSWER BOOK.
2. Start the answer to EACH question on a NEW page.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Present your answers according to the instructions of each question.
5. ALL drawings must be done in pencil and labels in blue or black ink.
6. Draw diagrams, flow charts or tables only when asked to do so.
7. The diagrams in this question paper are NOT necessarily drawn to scale.
8. Do NOT use graph paper.
9. You may use a non-programmable calculator, protractor and a compass, where necessary.
10. Write neatly and legibly.

downloaded from stanmorephysics.com

SECTION A**QUESTION 1**

1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A – D) next to the question numbers (1.1.1 to 1.1.10) in the answer book, for example 1.1.11 D.

1.1.1 Which gland is involved in regulating the salt balance in the body?

- A Pancreas
- B Hypothalamus
- C Pituitary
- D Adrenal

1.1.2 Dendrites always take impulses ...

- A to the cell body.
- B to the receptor.
- C to the synapse.
- D to the axon.

1.1.3 The largest part of the brain is the ...

- A cerebrum.
- B medulla oblongata.
- C cerebellum.
- D pons.

1.1.4 Which of the following applies to the level of abscisic acid in seeds which normally germinate in spring?

- A It increases from winter to spring.
- B It decreases from winter to spring.
- C It remains high from winter to spring.
- D It remains low from winter to spring.

1.1.5 Below is a list of characteristics seen at puberty. Study the list and answer the question that follows.

- (i) Increased levels of oestrogen and progesterone
More hair in the pubic region and under the armpits
- (ii) Muscle mass increases and shoulders become wider.
Larynx enlarges and voice becomes deeper.
- (iii) Increased levels of oestrogen and progesterone
More hair in the pubic region and under the armpits
- (iv) Muscle mass increases and shoulders become wider.

Which characteristics apply to puberty in males ONLY?

- A (i) and (iv)
- B (i) and (ii)
- C (ii) and (iii)
- D (iii) and (iv)

1.1.6 Which of the following is NOT part of the central nervous system?

- A Cerebrum
- B Medulla oblongata
- C Corpus luteum
- D Spinal cord

1.1.7 Which part of the autonomic nervous system has a similar effect on the body as adrenalin?



- A Somatic
- B Peripheral
- C Sympathetic
- D Parasympathetic

1.1.8 Which of the following represents the correct set of events involved in the secretion and action of ADH (antidiuretic hormone)?

	WATER LEVEL IN THE BLOOD: RELATIVE TO NORMAL	AMOUNT OF ADH PRODUCED: RELATIVE TO NORMAL	AMOUNT OF WATER REABSORBED BY KIDNEYS
A	Increase	Increase	Decrease
B	Increase	Decrease	Increase
C	Decrease	Increase	Increase
D	Decrease	Decrease	Decrease

1.1.9 A person experiences a decrease in blood glucose levels. This is because there is ...

- A an increase in insulin.
- B an increase in glucagon.
- C no adrenalin being released.
- D no growth hormone released.

1.1.10 A hypersecretion of which hormone causes a person to grow abnormally tall?

- A TSH
- B GH
- C LH
- D FSH

(10 x 2) (20)

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question numbers (1.2.1 to 1.2.5) in the ANSWER BOOK.

1.2.1 Tubular structure containing blood vessels which connects a foetus to the placenta

1.2.2 Glands which release hormones into the bloodstream

1.2.3 Type of neurons that joins sensory and motor neurons

1.2.4 Fluid around the brain and spinal cord that aids in protection

1.2.5 Part of a neuron which contains the nucleus

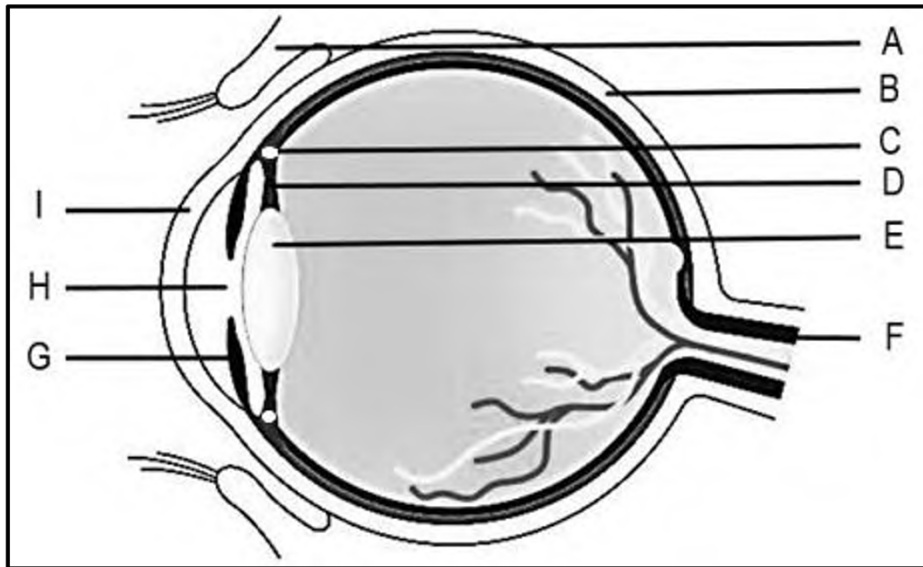
(5 x 1) (5)

1.3 Indicate whether each of the statements in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A and B** or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B**, or **none** next to the question numbers (1.3.1 to 1.3.3) in the ANSWER BOOK.

COLUMN I	COLUMN II
1.3.1 Plant defence mechanism	A Thorns B Chemicals
1.3.2 Function of the nervous system	A React to stimuli B Coordinate activities
1.3.3 The placenta originates from this part	A Chorion B Endometrium

(3 x 2) (6)

1.4 The diagram below represents parts of the human eye.



1.4.1 Identify the structures labelled **B**, **G** and **I** respectively. (3)

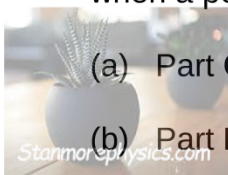
1.4.2 Give the LETTER and NAME of the part which:

(a) Increases in diameter during a fight or flight reaction (2)

(b) Is a bundle containing many sensory neurons (2)

(c) Prevents dust from entering the eye (2)

1.4.3 State the change that each of the following structures will undergo, when a person focuses on a near object:



(a) Part **C** (1)

(b) Part **D** (1)

(c) Part **E** (1)

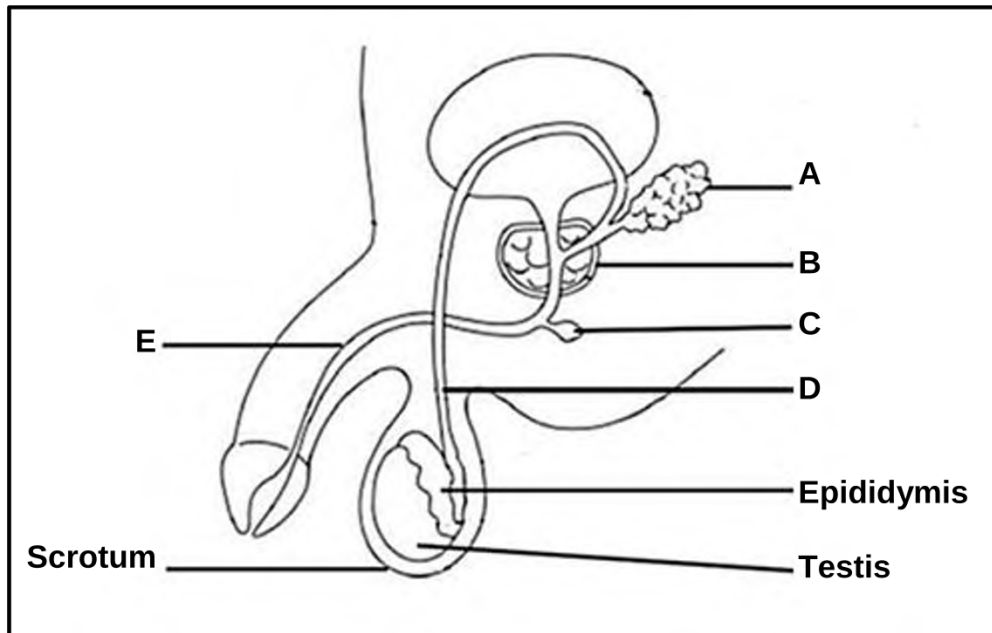
1.4.4 State ONE treatment for each of the following:

(a) Short-sightedness (1)

(b) Cataracts (1)

(14)

1.5 The diagram below represents the male human reproductive system.



1.5.1 Give the LETTERS of ALL the structures that are involved in each of the following:

- (a) Production of the fluid part of semen (1)
- (b) Transportation passageway of sperm and semen (1)

1.5.2 Name each of the following:

- (a) Gland **B** (1)
- (b) The hormone produced by the testes, that brings about the development of male secondary sexual characteristics (1)

1.5.3 Name the environmental factor to which the scrotum adjusts, to ensure optimum sperm production. (1)

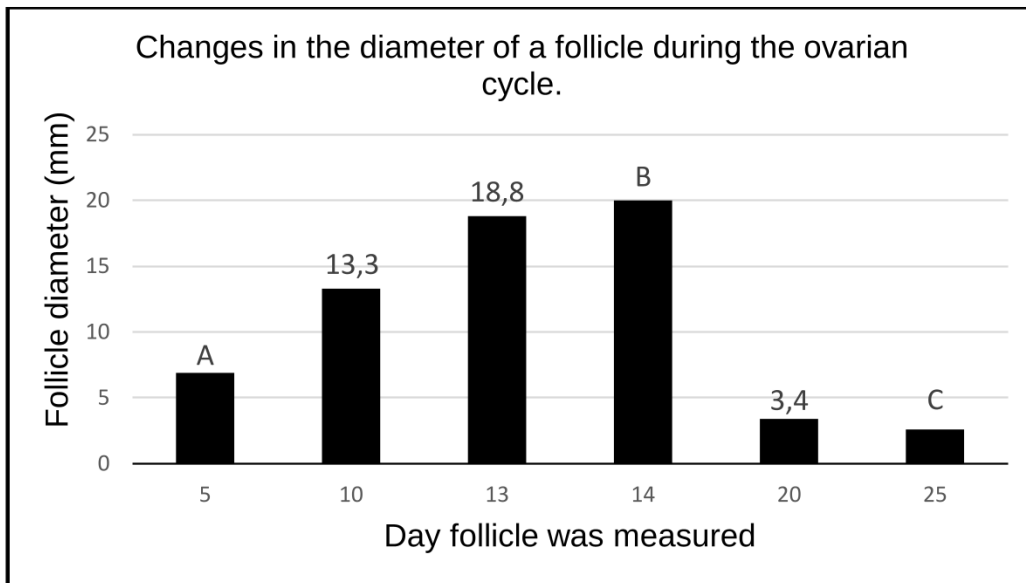
(5)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 The graph below shows changes in the diameter of a follicle during the first 25 days of the ovarian cycle.

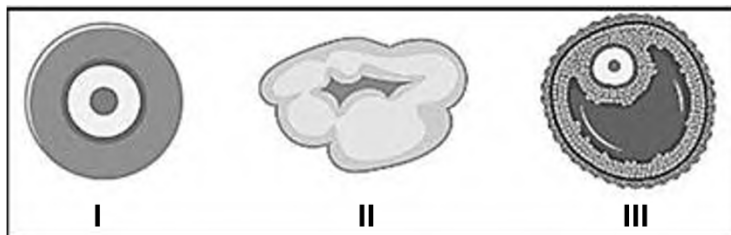


2.1.1 Give the diameter of the follicle on day 14. (1)

2.1.2 Calculate the percentage increase in follicle diameter from day 10 to 13. Show ALL workings. (3)

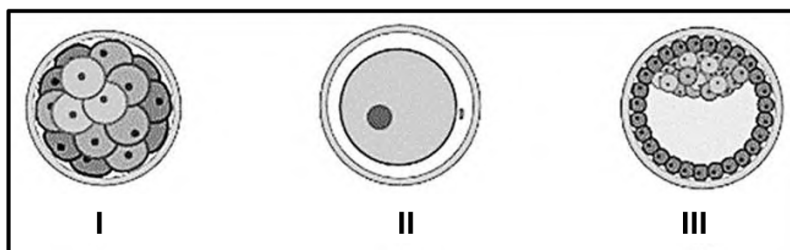
Questions 2.1.3 to 2.1.5 are based on the following information.

The images below show three different stages (primary follicle, Graafian follicle and the corpus luteum) in a follicle's development during the ovarian cycle. The follicles below are not in the correct order. The appearance of a follicle and diameter of the follicle change during the ovarian cycle, depending on which day in the ovarian cycle it is viewed. Use the graph above and the images below to answer Questions 2.1.3 to 2.1.5.



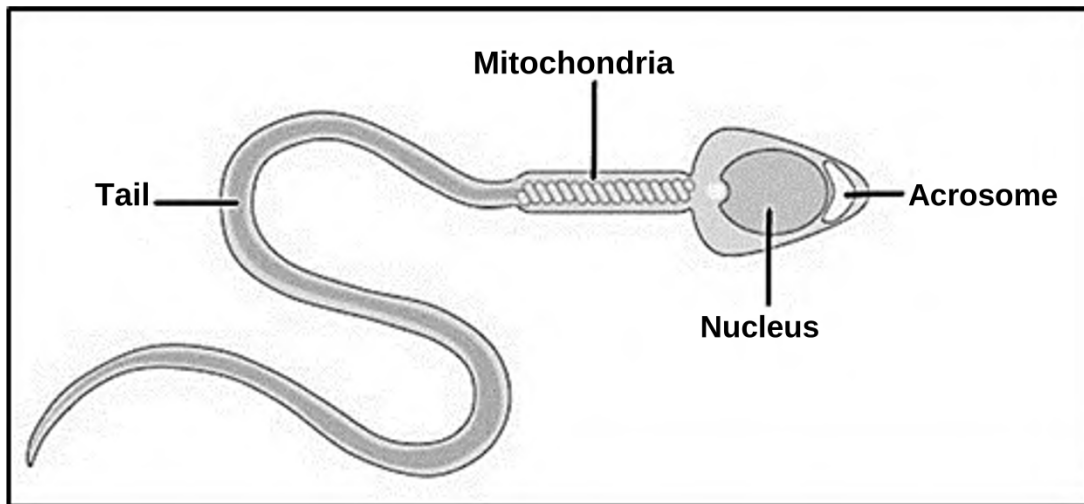
- 2.1.3 Name the follicles labelled **II** and **III**. (2)
- 2.1.4 Match each of the follicles labelled **I**, **II** and **III** to their corresponding bar **A**, **B** or **C** on the graph, e.g., **D** matches **IV**. (3)
- 2.1.5 If the change in follicle diameter seen after day 14 continues to day 28, explain how it will affect a woman's uterine cycle. (3)
- (12)**

- 2.2 The diagrams below show structures at different stages of development after fertilization in a human female.



- 2.2.1 Identify the structures in the diagrams labelled **I** and **III**. (2)
- 2.2.2 Describe how the cell in diagram **II** was formed. (3)
- 2.2.3 Draw a basic labelled diagram of the female reproductive system viewed from the front and indicate on the diagram where each of the structures above may be located, by using only the numbers **I**, **II** and **III**. (5)
- (10)**

2.3 The diagram below shows a sperm cell.



2.3.1 State how the following structures are suited to assist the sperm cell to perform its function:

(a) The mitochondria

(2)

(b) The acrosome

(2)

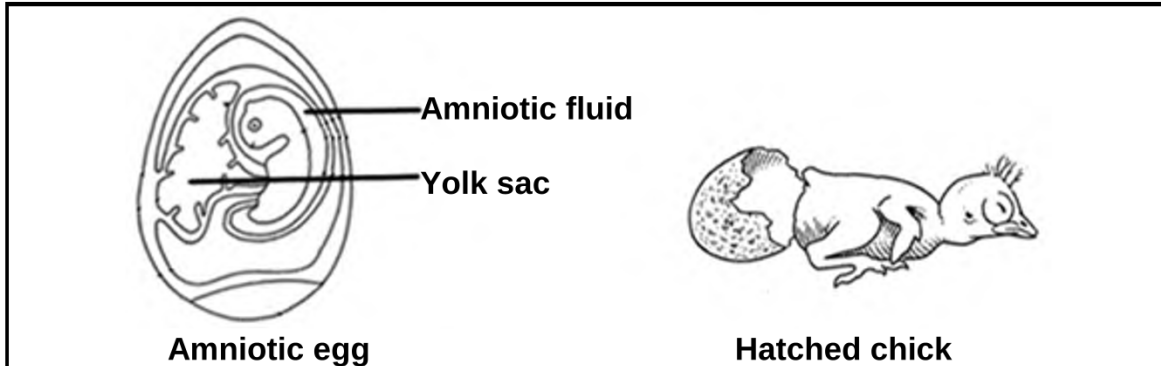
2.3.2 Sperm cells and ova are produced by gametogenesis. This happens when diploid cells undergo meiosis to produce haploid cells.

Tabulate TWO differences between gametogenesis in males and females, not mentioned in the text above.

(5)

(9)

- 2.4 The diagrams below show the internal structures of an amniotic egg after fertilization, as well as the chick that hatched from the egg.



- 2.4.1 Name the type of fertilization that has taken place. (1)
- 2.4.2 State the type of reproductive strategy which is shown by the development of an embryo within an amniotic egg. (1)
- 2.4.3 Identify the type of development that the hatched chick shows. (1)
- 2.4.4 Give TWO functions of the amniotic fluid. (2)
- 2.4.5 Explain how the size of the yolk sac affects the development of the chick in the diagram. (3)
- (8)**

2.5 Read the passage below and answer the questions that follow.

The physiological impact of a hunger strike

During normal metabolism the body breaks down complex carbohydrates into simple sugars such as glucose, which serves as fuel for the trillions of cells that make up the human body.

After eight hours of hunger strike, the body begins to slow its metabolism (the rate at which it consumes energy). The heart pumps slower and the body produces less heat. When the blood glucose levels have been depleted, the body begins to convert stored carbohydrates into glucose to generate energy through respiration. This will only last for a short period of time. Later, the body will need to use fat and muscle proteins to produce glucose.

- 2.5.1 Name the hormone that regulates the body's normal metabolism. (1)
- 2.5.2 Using the text above, give TWO specific functions of the hormone mentioned in QUESTION 2.5.1. (2)
- 2.5.3 Provide ONE alternative source of energy that the body uses when all carbohydrate reserves have been depleted. (1)
- 2.5.4 Name the stored carbohydrate which can be converted into glucose. (1)
- 2.5.5 Describe how the body of a hunger-striking person would convert stored carbohydrates into glucose. (6)

(11)

[50]

QUESTION 3

- 3.1 Researchers at the University of Cape Town have used the novel Infrared Thermal Technology (ITT), a technique with high sensitivity and digital accuracy, to measure the heat released by the human skin under different environmental temperature conditions. The results are shown in the table below.

Temperature (°C)	Average heat released ($\mu\text{Joule}/\text{cm}^2/\text{min}$)
16	30
20	50
24	70
28	110
32	160
36	200
40	200
44	200

- 3.1.1 Give the TERM used to describe the homeostatic control of body temperature. (1)
- 3.1.2 Describe how the blood vessels of the skin increased the average heat released when the environmental temperature increased from 16 °C to 36 °C. (3)
- 3.1.3 Explain why sweating plays a more important role in maintaining body temperature, when the environmental temperature increases from 36 °C to 44 °C. (4)
- 3.1.4 Use the information in the table to plot a line graph. (6)

**(14)**

- 3.2 A pot plant was placed onto its side in a dark box. After 2 weeks, the stem started to grow upwards.



- 3.2.1 Name the environmental factor which is responsible for the stem's upward growth when the pot plant was placed on its side. (1)
- 3.2.2 Identify the phenomenon which is indicated by the stem's upward growth. (1)
- 3.2.3 Name the plant hormone which is responsible for the stem's upward growth. (1)
- 3.2.4 Describe how the distribution of the hormone mentioned in QUESTION 3.2.3 caused the stem to bend in an upward direction. (4)
- 3.2.5 Explain ONE way in which the stem's upward growth benefits the plant. (2)
(9)
- 3.3 The human ear plays a vital role in hearing and balance which allows humans to respond to their environment.
- 3.3.1 Describe the process of hearing. (7)
- 3.3.2 Explain TWO ways in which the semi-circular canals are structurally suited for their function. (4)
(11)

- 3.4 One of the symptoms of COVID-19 is the loss of taste. Many patients take a very long time to regain their taste after recovering from COVID-19. A group of learners decided to perform an investigation to compare how the time after infection with the virus influences the amount of taste recovered. They got a number of learners who had recovered from COVID-19 and two learners who had never been infected, to volunteer for the investigation.

They followed the procedure below:

- They produced salt water solutions of different concentrations as described in the table below.

Table 1: Description of how the salt water solutions were produced

Bottle label	Solution concentration
Sample A	500 ml water with no addition (pure water)
Sample B	500 ml water with 1 teaspoon of salt
Sample C	500 ml water with 2 teaspoons of salt
Sample D	500 ml water with 3 teaspoons of salt
Sample E	500 ml water with 4 teaspoons of salt

- Pipettes (droppers) were used to place 3 drops of one solution on the tongue of the participants.
- The participants were asked if they could taste the salt.
- After 5 minutes, 3 drops of another solution were placed on the tongues of the participants. They were again asked if they could taste the salt.
- This process was repeated until all of the solutions were tested on each of the participants.
- The solutions were given to volunteers in a random order.

The results of the investigation are captured in the table below. An X was placed in the block if the learner said that they could taste the saltiness.

Name of participant	Duration since COVID-19 infection	Sample				
		A 500 ml water + no salt	B 500 ml water + 1 spoon of salt	C 500 ml water + 2 spoons of salt	D 500 ml water + 3 spoons of salt	E 500 ml water + 4 spoons of salt
Zayzay	2 weeks					X
Kayla	2 weeks					X
Maimoonah	4 weeks				X	X
Mpho	4 weeks				X	X
Jessica	6 weeks			X	X	X
Tumisang	6 weeks			X	X	X
Given	6 weeks	X		X		
Urwa	8 weeks		X	X	X	X
Katleho	8 weeks		X	X	X	X
Rethabile	Never had		X	X	X	X
Martinus	Never had		X	X	X	X

NOTE: The learners decided not to consider Given's data in their analysis as they thought he was deliberately (on purpose) giving incorrect answers. They replaced him with Tumisang who also recovered from COVID-19 six weeks ago.

- 3.4.1 Consider the samples (A – E). Which sample had the greatest concentration of salt? (1)
- 3.4.2 Describe how the nervous system enables a normal person to interpret the taste of a salty liquid (stimulus) when placed on the tongue. (3)
- 3.4.3 Identify the dependent variable in this investigation. (1)
- 3.4.4 Identify TWO variables that the learners kept the same. (2)
- 3.4.5 Describe the general trend shown by the results. (2)
- 3.4.6 Select the TWO participants that acted as the control in this investigation. (2)

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3.4.7 Give a reason for your answer to QUESTION 3.4.6. (1)

3.4.8 Explain how leaving out Given's results, and replacing it with Tumisang's results, affects both the reliability and validity of the investigation. (4)
(16)

[50]

TOTAL SECTION B: 100

TOTAL: 150



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✓ (b) F✓ – Optic nerve✓ (c) A✓ – Eyelid✓	(2) (2) (2)
	1.4.3	(a) It contracts✓ (b) It slackens✓/loosens (c) Becomes more convex✓/more rounded	(1) (1) (1)
	1.4.4	(a) Concave lenses✓/ Concave Glasses/(Laser) surgery (b) Surgery✓/synthetic lens	(1) (1) (14)
1.5	1.5.1	(a) A, B, and C✓ (only accept if all three are correct) (b) D and E✓ (only accept if both are correct)	(1) (1)
	1.5.2	(a) Prostate✓ gland (b) Testosterone✓	(1) (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)

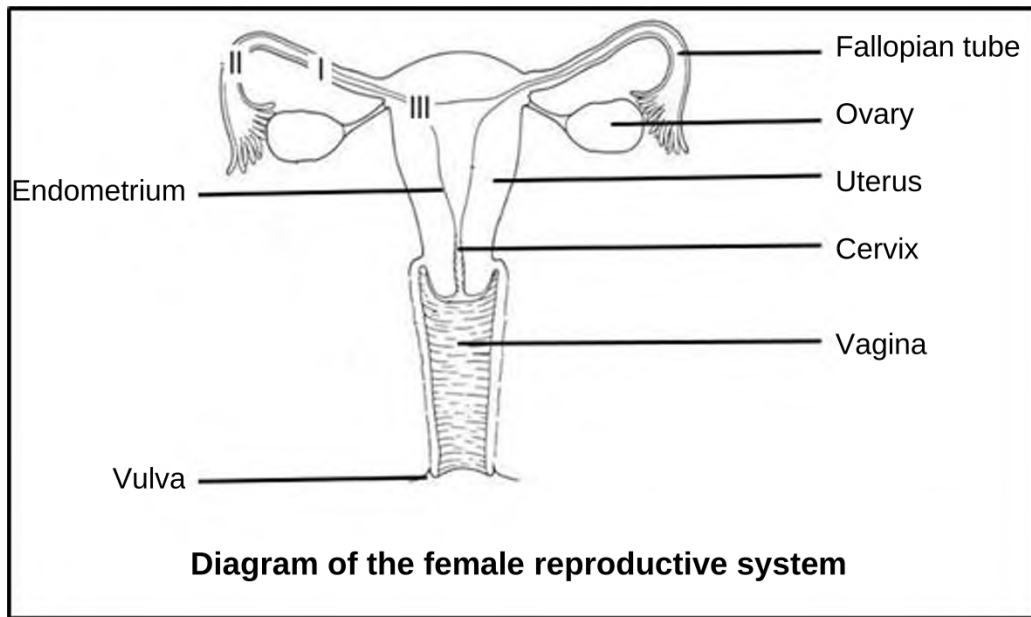
2.2.2 – Sperm cell's nucleus✓ enters the ovum and }
– fuses with the ovum's nucleus✓ } OR fertilization✓
– to form the zygote✓/diploid nucleus of this cell.

OR

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

(3)

2.2.3



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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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: <ul style="list-style-type: none"> - Respiration✓/energy production - Energy consumption✓/metabolism - Heat production✓ - Heart rate✓ 		
		Mark first TWO only	(Any 2)	(2)
	2.5.3	<ul style="list-style-type: none"> - Fat✓ - (Muscle) protein✓ 		
		Mark first ONE only	(Any 1)	(1)
	2.5.4	Glycogen✓		(1)
	2.5.5	<ul style="list-style-type: none"> - 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

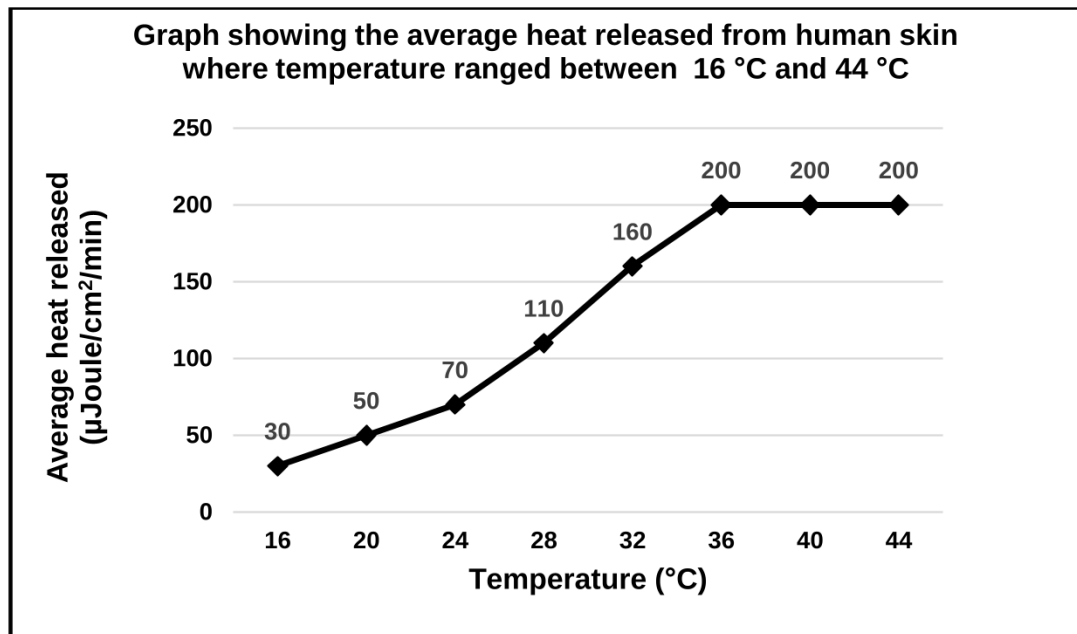
3.1 3.1.1 Thermoregulation✓ (1)

- 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)



- 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	(P)	1
	All 8 points plotted correctly		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)
- 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
56	57
57	58
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
130	132
131	133
132	134
133	135
134	136
135	137
136	138
137	139
138	140
139	141
140	142
141	143
142	144
143	145
144	146
145	147
146	148
147	149
148	150