GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PREPARATORY EXAMINATION

2024

10831

LIFE SCIENCES

(PAPER 1)

TIME: 2½ hours

MARKS: 150

LIFE SCIENCES: Paper 1

10831E

17 pages

X05

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

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

SECTION A

QUESTION 1

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

1.1.1 Which structure protects the entrance to the vagina?

A Cervix
B Vulva
C Anus
D Urethra

1.1.2 In humans, fertilisation usually takes place in the …

A fallopian tubes.
B vagina.
C uterus.
D ovary.

1.1.3 Which part of the brain is responsible for voluntary movement?

A Cerebrum
B Cerebellum
C Medulla oblongata
D Hypothalamus

1.1.4 Which disease occurs when blood sugar levels are too high?

A Hyperthyroidism
B Goitre
C Diabetes
D Rickets

1.1.5 The structure that joins the two hemispheres of the brain is called the ...

A corpus callosum.
B hypothalamus.
C medulla oblongata.
D pituitary.

1.1.6 The pupillary reflex is the ability of a typical human eye to adjust to different light intensities in the environment.

Which combination of processes will occur in a typical human eye when the light intensity changes from dark to bright light?

(i) Radial muscles contract
(ii) Circular muscles contract
(iii) Pupil constricts
(iv) Radial muscles relax
(v) Circular muscles relax
(vi) Pupil dilates

A (ii), (iii) and (iv) only
B (i), (ii) and (iii) only
C (i), (v) and (vi) only
D (iii), (iv) and (v) only

1.1.7 Which of the following can be used to treat a severe middle ear infection?

A Wax cleaner
B Grommets
C Hearing aid
D Cochlear implant

1.1.8 A person experiences the following symptoms:

- Loses weight easily
- Is always hungry
- Never feels cold

The most likely explanation for this combination of symptoms is that the person …

A secretes too much growth hormone.
B has an overactive thyroid gland.
C is diabetic and just had an insulin injection.
D has an underactive hypothalamus.

1.1.9 Secretions are released into a cavity or onto the surface through a duct in the body by …

A an endocrine gland.
B an exocrine gland.
C the nervous system.
D the circulatory system.

1.1.10 Which of the following occurs when the sympathetic nervous system is more active than the parasympathetic nervous system?

A Increased breathing rate
B Decreased heart rate
C Constriction of pupils
D Increase in digestion (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 1.2.6) in the ANSWER BOOK.

1.2.1 Sharp structures found in plants for protection from herbivores

1.2.2 Type of vision that results from having two eyes

1.2.3 A hormone produced by the pituitary gland that stimulates milk production in human females

1.2.4 A condition where the cornea is uneven, resulting in blurry vision

1.2.5 The response of stems towards a light stimulus

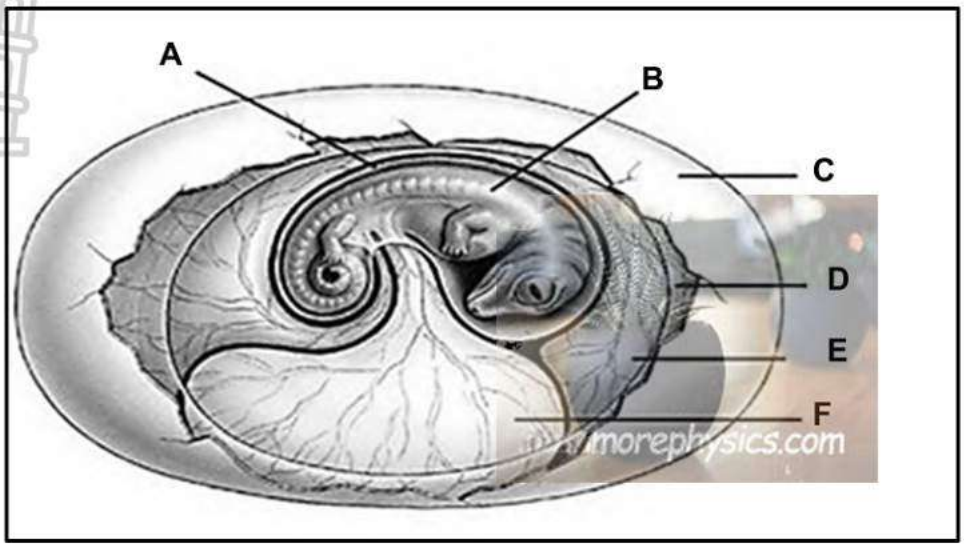
1.2.6 A hollow ball of cells formed from the zygote (6 x 1) **(6)**

1.3 Indicate whether each of the descriptions 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, 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 The hormone that is in excess in an abnormally tall person	A: Lutenising hormone B: Growth hormone
1.3.2 Corrective lenses for long-sightedness	A: Convex B: Concave
1.3.3 A disease of the CNS	A: Multiple sclerosis B: Alzheimer's disease

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

1.4 Study the diagram below of an amniotic egg and answer the questions that follow.



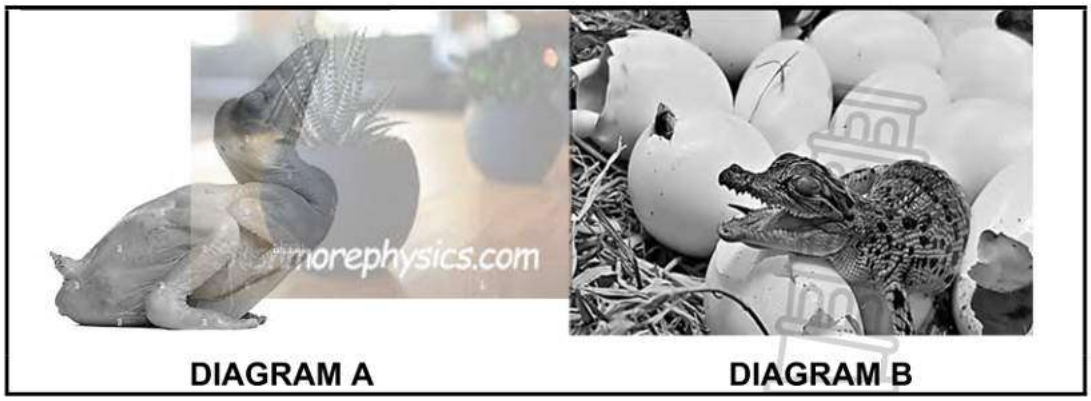
1.4.1 Give the LETTER and NAME of the part that:

(a) Protects the developing embryo from predators (2)

(b) Provides nutrients to the embryo during its development (2)

(c) Allows for the storage of waste products from the embryo (2)

1.4.2 The diagrams below show different stages of development.

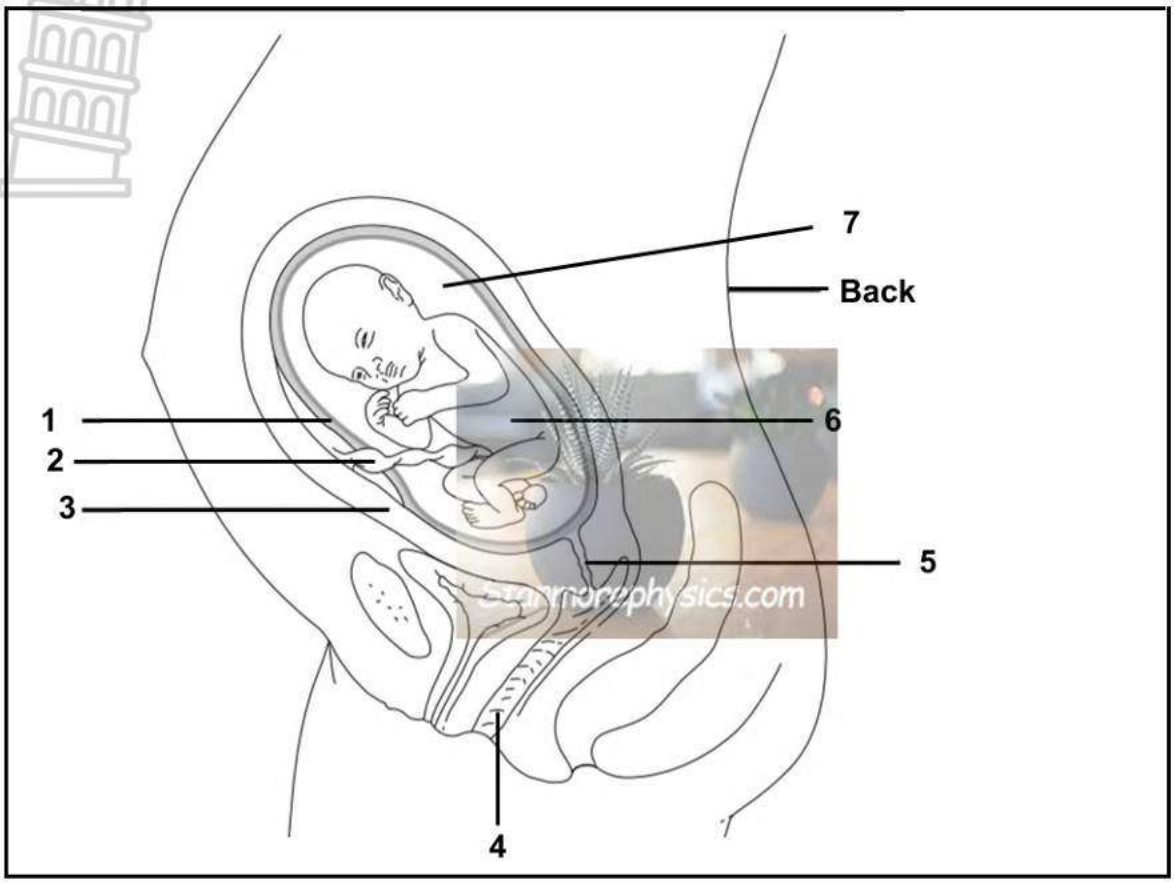


Name the diagram that represents:

(a) Altricial development (1)

(b) The type of development where a small amount of yolk was available to the embryo (1)
(8)

1.5 The diagram below shows the uterus of a pregnant woman.



1.5.1 Identify the structures numbered:

(a) **1** (1)
(b) **3** (1)
(c) **5** (1)
(d) **6** (1)

1.5.2 Name the structure that:

(a) Acts as the birthing canal (1)
(b) Secretes a hormone that maintains pregnancy (1)
(c) Transports oxygen and nutrients to the developing foetus (1)

1.5.3 Name the tissue of the uterus that contracts to enable the woman to "push" the baby out during birth. (1)

1.5.4 Several functions are listed below.

1. Acts as a microfilter
2. Allows for free movement of the foetus as it grows and develops
3. Gaseous exchange between mother and foetus
4. Protects the foetus against desiccation
5. Provides immunity to the foetus
6. Secretes a hormone
7. Shock absorber
8. Thermoregulation

Which of the above functions is/are applicable to the amniotic fluid?

Write only the NUMBER/S in your ANSWER BOOK. (2)

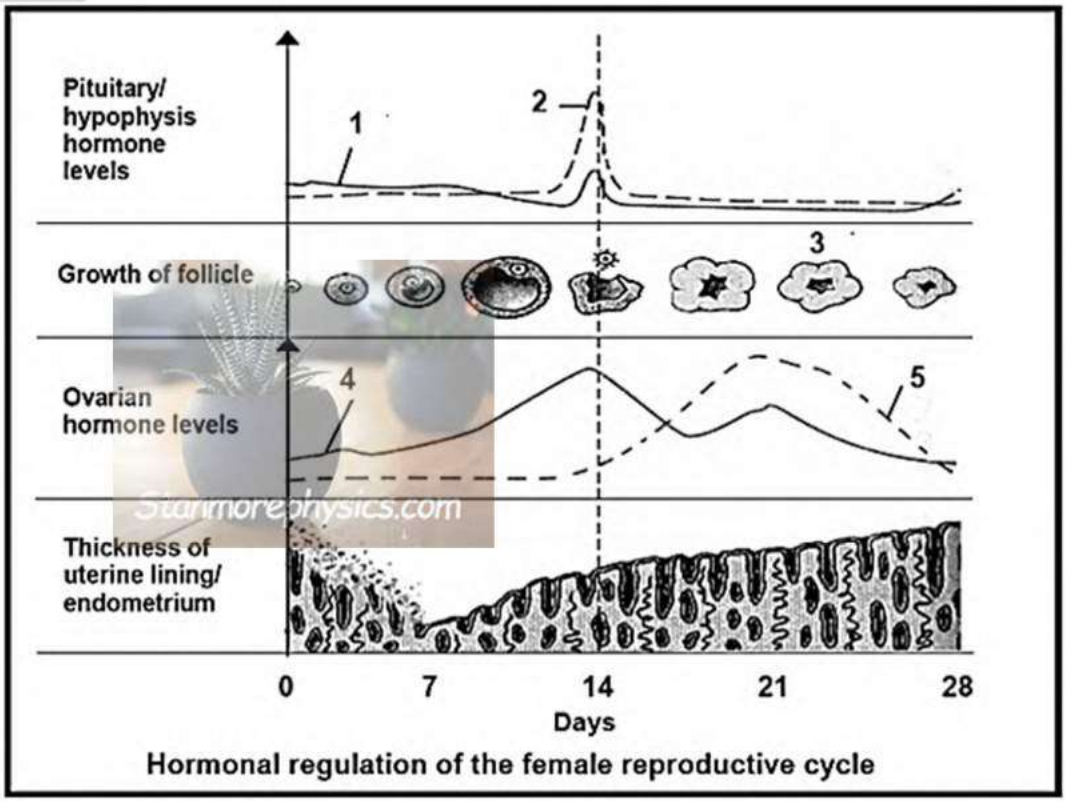
(10)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 Study the diagrams and graphs below, which show the hormonal regulation of the female reproductive cycle.



Hormonal regulation of the female reproductive cycle

2.1.1 Give the NUMBER and NAME of the hormone that:

(a) Stimulates the development of a follicle (2)

(b) Maintains the endometrium between days 7 and 14 (2)

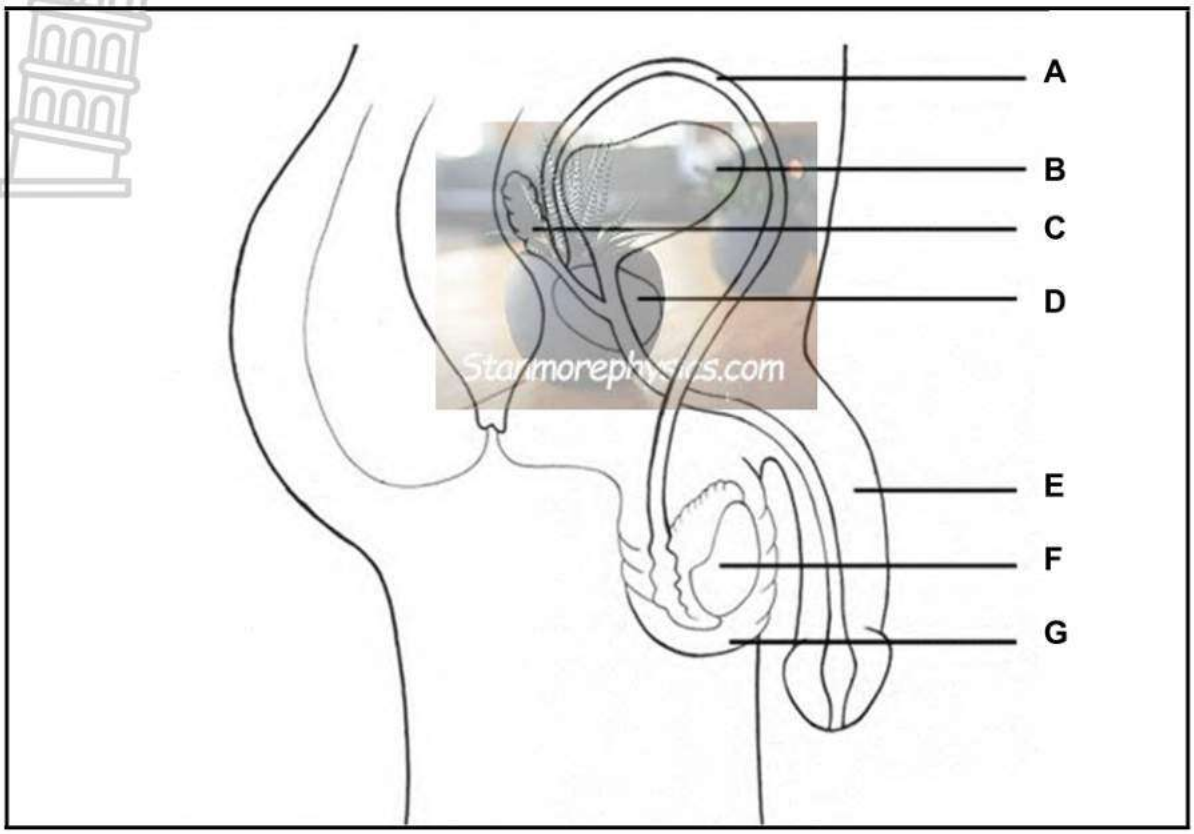
2.1.2 (a) Explain the function of the corpus luteum. (2)

(b) Describe how the corpus luteum is formed. (3)

2.1.3 Give TWO visible reasons, using the information from the diagrams and graphs above, to explain why the woman is not pregnant. (2)

(11)

2.2 The diagram below represents the human male reproductive system.



2.2.1 Identify the parts labelled:

(a) **A** (1)

(b) **E** (1)

2.2.2 Explain the function of structure **G**. (2)

2.2.3 Name and describe the process by which gametes are produced in part **F**. (4)

2.2.4 Draw a diagram of a gamete produced in part **F**. (5)

2.2.5 Draw a flow diagram showing the pathway of sperm cells during ejaculation. (2)

(15)

2.3 A student studied the effects of various plant hormones on the growth of corn seedlings.

- Corn seedlings of the same height and species were used.
- The student took four groups of 10 plants each.
- All initial heights of the seedlings were 1 cm.
- Each group received the same amount of water.
- She gave one group water only, while the other groups each received 1,00 micrograms of a different hormone mixed in with the water.
- After 15 days, she measured the height of each seedling from each group, calculated the average and recorded the information in the table below.

Various plant hormones mixed in water	Height of seedlings (cm)
Water only	21
Abscisic acid + water	19
Auxin + water	22
Gibberellins + water	48

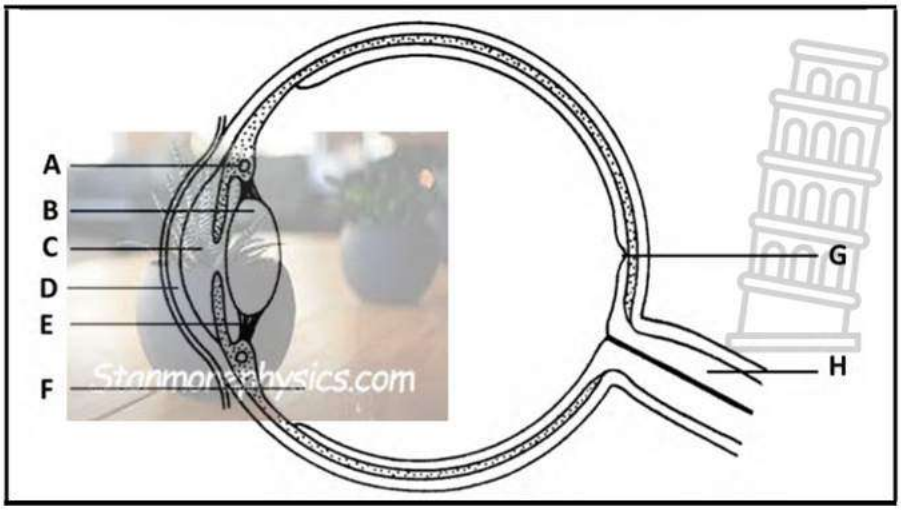
2.3.1 Which plant hormone produced the tallest plants? (1)

2.3.2 Identify TWO ways that the student ensured the validity of the investigation. (2)

2.3.3 Give TWO functions of abscisic acid. (2)

2.3.4 Draw a bar graph to represent the data in the table above. (6)
(11)

2.4 The diagram below shows a longitudinal section through a human eye.



2.4.1 Give the NAME of the part that:

(a) Maintains the shape of the eye together with the sclera (1)

(b) Carries impulses to the cerebrum (1)

2.4.2 Explain ONE feature shared by parts **B** and **D** that makes them suited to the function for clear vision. (2)

2.4.3 Discuss how parts **G** and **H** work together for vision to occur. (4)

2.4.4 Tabulate TWO structural differences between a healthy eye when looking at an object closer than 6 m away and when looking at an object further than 6 m away. (5)

(13)
[50]

QUESTION 3

3.1 An investigation was conducted to observe the time taken for blood alcohol levels to return to normal after the consumption of various volumes of alcohol.

The investigator invited four people to participate in the investigation. Each participant was asked to read the following governmental warning label about the consumption of alcohol:

GOVERNMENTAL WARNING:

1. According to the Surgeon General, women should not drink alcoholic beverages during pregnancy because of the risk of birth defects.

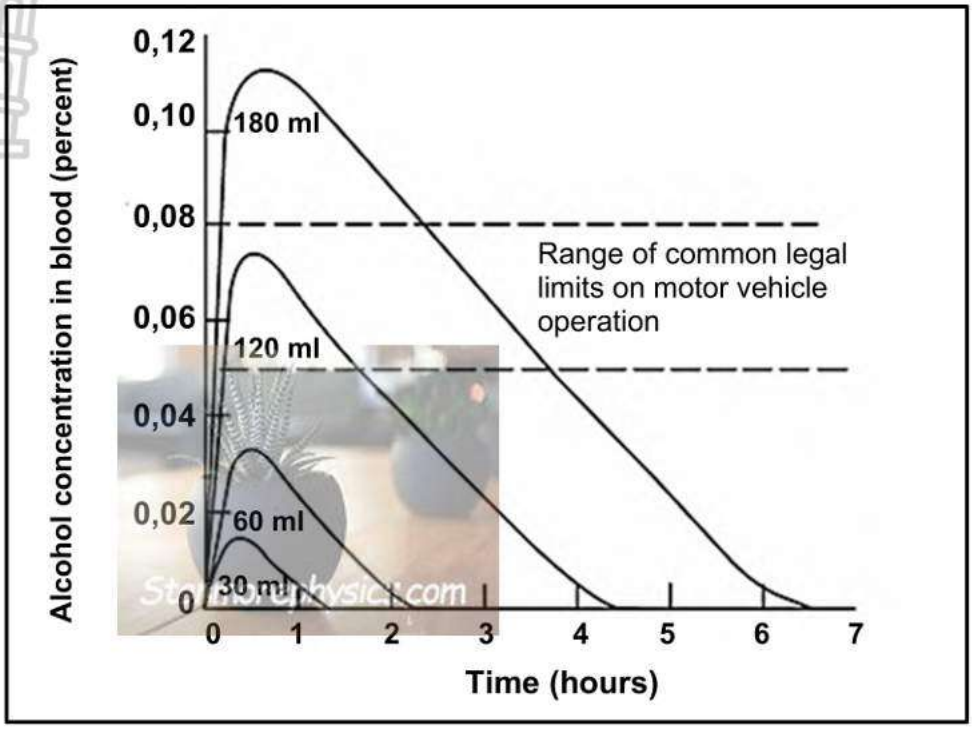
2. Consumption of alcoholic beverages impairs your ability to drive a car or operate machinery and may cause health problems.

Each participant was given a specific volume of alcohol to drink:

Participant	Volume of alcohol/ml
1	30
2	60
3	120
4	180

The blood alcohol concentration was measured before the participants drank the alcohol and every 30 minutes thereafter until the blood alcohol concentration returned to 0%.

The graph below shows the results of the investigation.



3.1.1 How many hours does it take for a person to be legally able to drive after consuming 180 ml of alcohol? (2)

3.1.2 For this investigation, identify the dependent variable. (1)

3.1.3 Suggest TWO reasons why the investigator would ask the participants not to consume alcohol for 48 hours before the investigation. (2)

3.1.4 For this investigation, describe:

(a) TWO safety precautions (2)

(b) TWO planning steps (2)

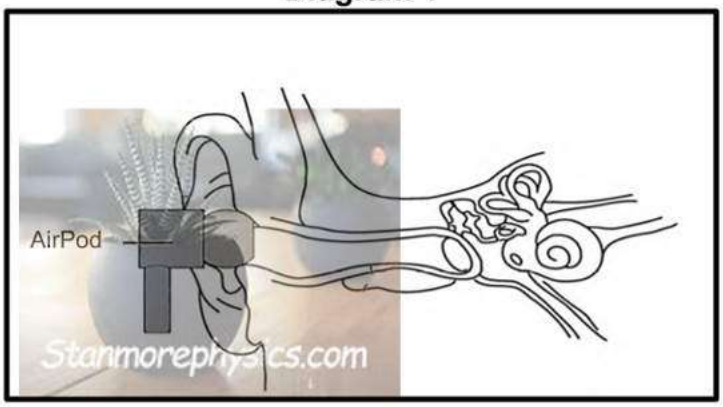
3.1.5 (a) Based on the table above, are the investigation results reliable? (1)

(b) Give a reason for your answer to QUESTION 3.1.5 (a). (2)

3.1.6 Write a suitable conclusion for this investigation. (2)
(14)

3.2 AirPods are wireless listening devices that fit into the ear and direct sound, allowing users to listen to music from their phones privately without disturbing others.

Diagram 1



A smartphone has a feature that can monitor the volume of music being played through the AirPods and give warning notifications if the volume exceeds 80 dB (decibels).

Fred and Tebogo are listening to the same music. Diagrams **2** and **3** below show their phone displays.

Diagram 2

Diagram 3

3.2.1 Name the part of the ear that:

(a) Vibrates due to the direct effect of sound waves (1)

(b) Contains receptor cells which detect the sound stimulus (1)

(c) Equalises pressure in the middle ear (1)

(d) Channels sound waves to the middle ear (1)

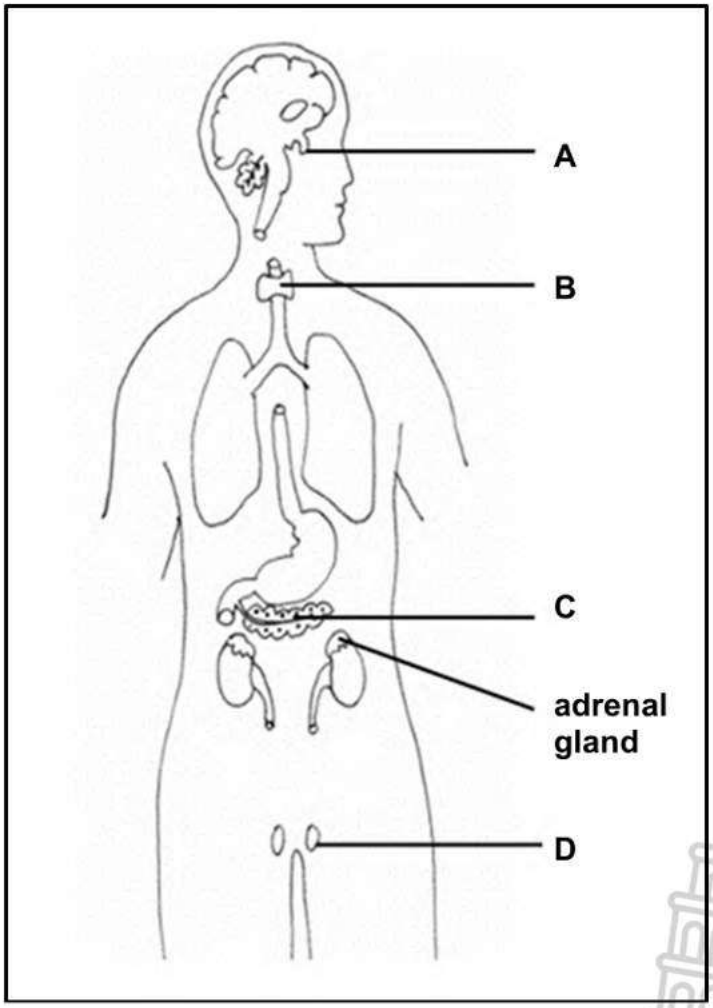
3.2.2 Explain TWO ways in which AirPods could prevent a person from hearing other environmental noise. (4)

3.2.3 Use diagrams **2** and **3** and answer the following questions.

(a) Who is more at risk for damage to their sound receptor cells? (1)

(b) Explain your answer to QUESTION 3.2.3 (a). (2)
(11)

3.3 The diagram below shows the male body with the position of various glands.

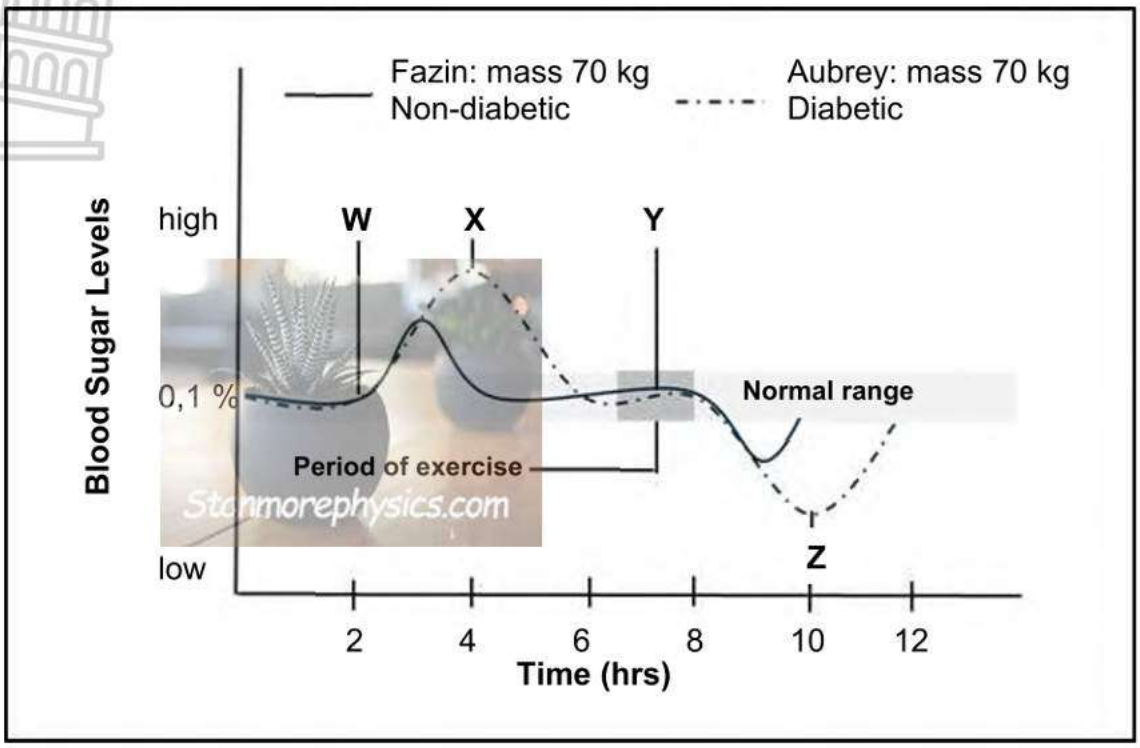


3.3.1 (a) Name TWO hormones secreted by the adrenal gland. (2)

(b) Name the hormone secreted by gland **D**. (1)

3.3.2 Name and describe the role of gland **A** when the hormone secreted by gland **B** increases above the normal level. (5)
(8)

3.4 Study the graph below and answer the questions that follow.



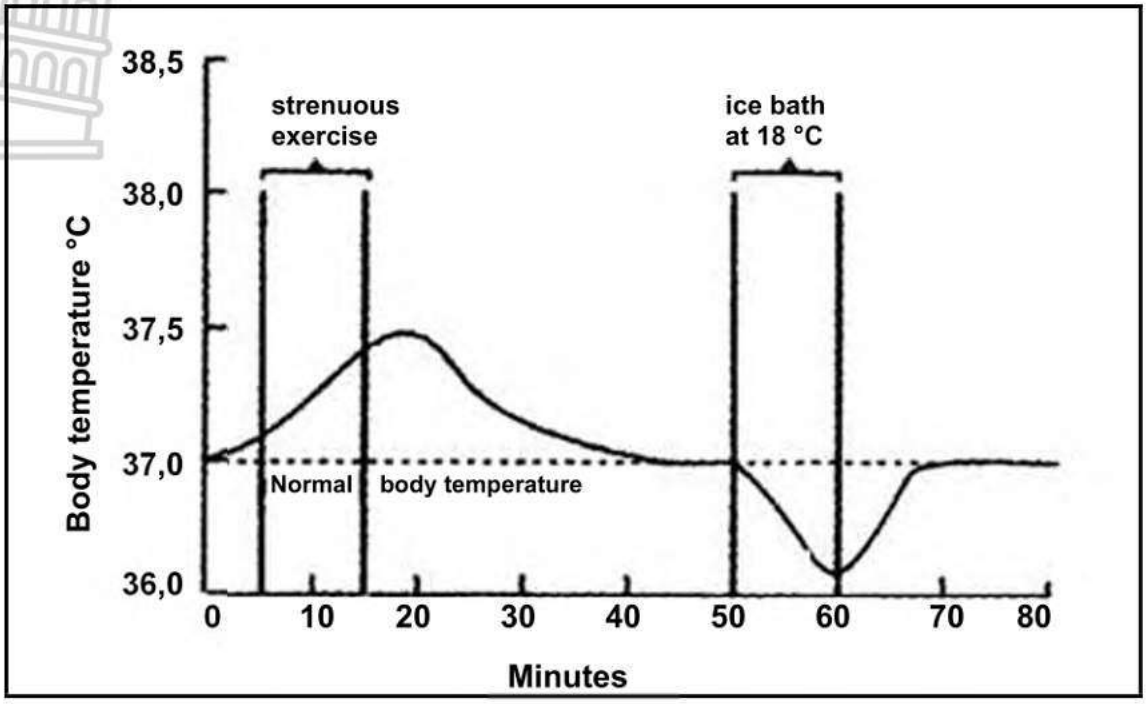
3.4.1 (a) Name the hormone Aubrey received at **X** on the graph. (1)

(b) Provide a suitable reason for your answer to QUESTION 3.4.1 (a). (1)

3.4.2 Define the term *homeostasis*. (2)

3.4.3 Describe the negative feedback mechanism that occurs between points **Y** and **Z**. (5)
(9)

3.5 The graph below shows the effect of strenuous exercise on an athlete's body temperature, followed by an ice bath.



3.5.1 Which part of the brain responds to changes in the body's temperature? (1)

3.5.2 Describe the changes in the athlete's body between 20 and 40 minutes, as illustrated in the graph. (5)

3.5.3 Explain the cause of the increase in body temperature during strenuous exercise. (2)

(8)

[50]

TOTAL SECTION B: 100

TOTAL: 150

END

GAUTENG PROVINCE
Department: Education
REPUBLIC OF SOUTH AFRICA

AMENDMENT TO MARKING GUIDELINES

PREPARATORY EXAMINATIONS – 2024

ATTENTION: THE CHIEF INVIGILATOR

SUBJECT / *VAK*	**LIFE SCIENCES / *LEWENSWETENSKAPPE***
PAPER / *VRAESTEL*	**1**
DATE OF EXAMINATION / *DATUM VAN EKSAMEN*	**6 SEPTEMBER 2024**

The errata for the Marking Guidelines of LIFE SCIENCES P1 has reference.
There was an anomaly in the manner in which **Question 3.4.3** was presented on both the English and Afrikaans versions of the question paper. This matter was addressed at the Marking Standardisation Meeting.
To ensure that candidates are not disadvantaged and prejudiced in way, you are advised to please ask your Life Sciences educator(s) to **ignore Question 3.4.3** when marking.

In other words, the paper must be marked out of a total of 145 instead of 150 and then the learners' marks must be converted to a mark out of 150. E.g., Should a learner attain 85/145 then that mark is recalculated as 88/150.

Use the formula: $\frac{a}{145} \times 100 = b.$ *Then,* $\frac{b}{100} \times 150 = c$

C is the mark that is entered into SASAMS ***out of 150****.*

Please ensure that BOTH marks ($\frac{\mathbf{85}}{\mathbf{145}}$ **AND** $\frac{\mathbf{88}}{\mathbf{150}}$) are reflected on the cover page of candidates' answer scripts.

Mr. Jonathan Williams

DIRECTOR: EXAMINATIONS MANAGEMENT

6 SEPTEMBER 2024

Please note, the paper is to be marked out of 145 not 150.

USE THE CONVERSION TABLE BELOW

145 – 150

145	150	145	150	145	150	145	150	145	150
1	**1**	30	**31**	59	**61**	88	**91**	117	**121**
2	**2**	31	**32**	60	**62**	89	**92**	118	**122**
3	**3**	32	**33**	61	**63**	90	**93**	119	**123**
4	**4**	33	**34**	62	**64**	91	**94**	120	**124**
5	**5**	34	**35**	63	**65**	92	**95**	121	**125**
6	**6**	35	**36**	64	**66**	93	**96**	122	**126**
7	**7**	36	**37**	65	**67**	94	**97**	123	**127**
8	**8**	37	**38**	66	**68**	95	**98**	124	**128**
9	**9**	38	**39**	67	**69**	96	**99**	125	**129**
10	**10**	39	**40**	68	**70**	97	**100**	126	**130**
11	**11**	40	**41**	69	**71**	98	**101**	127	**131**
12	**12**	41	**42**	70	**72**	99	**102**	128	**132**
13	**13**	42	**43**	71	**73**	100	**103**	129	**133**
14	**14**	43	**44**	72	**74**	101	**104**	130	**134**
15	**15**	44	**45**	73	**75**	102	**105**	131	**135**
15	**16**	44	**46**	73	**76**	102	**106**	131	**136**
16	**17**	45	**47**	74	**77**	103	**107**	132	**137**
17	**18**	46	**48**	75	**78**	104	**108**	133	**138**
18	**19**	47	**49**	76	**79**	105	**109**	134	**139**
19	**20**	48	**50**	77	**80**	106	**110**	135	**140**
20	**21**	49	**51**	78	**81**	107	**111**	136	**141**
21	**22**	50	**52**	79	**82**	108	**112**	137	**142**
22	**23**	51	**53**	80	**83**	109	**113**	138	**143**
23	**24**	52	**54**	81	**84**	110	**114**	139	**144**
24	**25**	53	**55**	82	**85**	111	**115**	140	**145**
25	**26**	54	**56**	83	**86**	112	**116**	141	**146**
26	**27**	55	**57**	84	**87**	113	**117**	142	**147**
27	**28**	56	**58**	85	**88**	114	**118**	143	**148**
28	**29**	57	**59**	86	**89**	115	**119**	144	**149**
29	**30**	58	**60**	87	**90**	116	**120**	145	**150**

GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PREPARATORY EXAMINATION

2024

MARKING GUIDELINES

LIFE SCIENCES (PAPER 1) (10831)

11 pages

PRINCIPLES RELATED TO MARKING LIFE SCIENCES

1. **If more information than marks allocated is given**
   Stop marking when maximum marks are 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 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 the 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 the sequence and links become correct again, resume credit.

9. **Non-recognised abbreviations**
   Accept if first defined in the answer. If not defined, do not credit the unrecognised abbreviation but credit the rest of the answer if correct.

10. **Wrong numbering**
    It is acceptable if the answer fits into the correct sequence of questions, but the wrong number is given.

11. **If the language used changes the intended meaning**
    Do not accept.

12. **Spelling errors**
    Accept it if recognisable, 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 memo discussion meeting.

14. **If only a letter is asked for and only a name is given (and vice versa)**
Do not credit.

15. **If units are not given in measurements**
Candidates will lose marks. The memorandum will allocate marks for units separately.

16. Be sensitive to the **sense of an answer, which may be stated differently**

17. **Caption**
All illustrations (diagrams, graphs, tables, etc.) must have a caption.

18. **Code-switching of official languages (terms and concepts)**
A 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 applies to all official languages.

19. **Changes to the markign 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 A ✓✓ or B ✓✓

1.1.4 C ✓✓

1.1.5 A ✓✓

1.1.6 A ✓✓

1.1.7 B ✓✓

1.1.8 B ✓✓

1.1.9 B ✓✓

1.1.10 A ✓✓ (10 x 2) **(20)**

1.2 1.2.1 Thorns ✓/spikes/prickles

1.2.2 Binocular ✓ vision

1.2.3 Prolactin ✓

1.2.4 Astigmatism ✓

1.2.5 Phototropism ✓

1.2.6 Blastocyst/Blastula ✓ (6 x 1) **(6)**

1.3 1.3.1 B Only ✓✓

1.3.2 A Only ✓✓

1.3.3 Both A and B ✓✓ or B only ✓✓ (3 x 2) **(6)**

1.4 1.4.1 (a) C ✓ Egg shell/shell ✓ (2)
(b) F ✓ Yolk ✓ (2)
(c) E ✓ Allantoïs ✓ (2)

1.4.2 (a) (Diagram) A ✓ (1)
(b) (Diagram) A ✓ (1)
(8)

1.5	1.5.1	(a)	Amnion ✓	(1)
		(b)	Uterus ✓/uterus wall	(1)
		(c)	Cervix ✓	(1)
		(d)	Foetus ✓	(1)
	1.5.2	(a)	Vagina ✓	(1)
		(b)	Placenta ✓	(1)
		(c)	Umbilical vein ✓ /umbilical cord	(1)
	1.5.3		Muscle ✓/myometrium	(1)
	1.5.4		2, 4, 7, 8 ✓✓ **All numbers must be included to earn both marks numbers can be in any order.**	(2)
				(10)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 (a) 1 ✓ – FSH✓/Follicle stimulating hormone (2)

(b) 4 ✓ – Oestrogen ✓ (2)

2.1.2 (a) – Secretes progesterone ✓
– To maintain the endometrium ✓ (2)

(b) – The pituitary gland/hypophysis ✓
– secretes LH ✓/luteinising hormone
– which stimulates the conversion of the ruptured Graafian follicle ✓ into the corpus luteum (3)

2.1.3 – The corpus luteum/structure 3 is getting smaller ✓/degenerating
– Progesterone/hormone 5 levels are dropping ✓/decreasing
– FSH/hormone 1 levels are increasing on days 27 – 28 ✓
(Mark first TWO only) (2)
(11)

2.2 2.2.1 (a) Vas deferens ✓ (1)

(b) Penis ✓ (1)

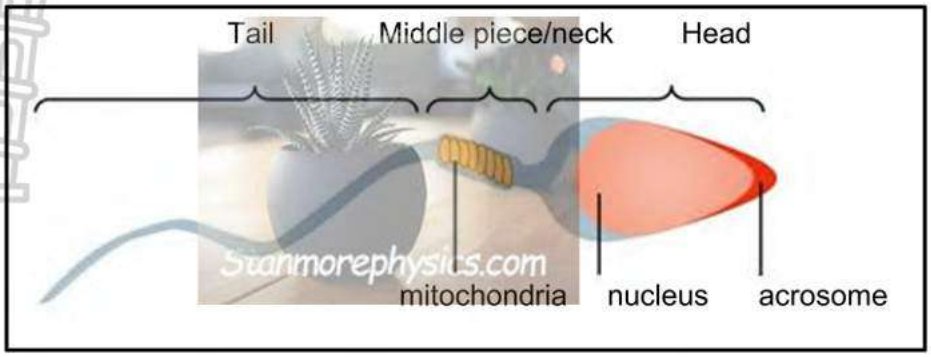
2.2.2 – Protection of testes ✓
– Because they are held outside the body ✓

OR

– Holds the testes outside of the body ✓
– to ensure they are at a lower temperature for optimum/healthy sperm cell production ✓ (2)

2.2.3 **Spermatogenesis** ✓*
– Under the influence of testosterone ✓
– diploid cells in the seminiferous tubules ✓ of the testes undergo meiosis ✓
– to form haploid sperm cells ✓
*** compulsory mark and any THREE points** (4)

2.2.4 Diagram of a sperm cell



The caption must include sperm cell	C ✓	(1)
The diagram contains a head with an acrosome and nucleus, a middle piece and a tail	D ✓	(1)
The correct proportion of the head, middle portion and tail	P ✓	(1)
Labels: any two correct labels	L ✓✓	(2)
TOTAL:		**5**

(5)

2.2.5 Epididymis → vas deferens /Sperm duct → urethra ✓✓
If the word testes is mentioned, no marks to be awarded

(2)
(15)

2.3 2.3.1 Gibberellins ✓ (1)

2.3.2
- Same height of corn seedling/All initial heights were 1 cm
- Same species were used
- Same number of seedlings in each sample
- Same amount of water was given
- Same amount of hormone mixture in water/1,00 micrograms of hormone
- Same period of 15 days for the experiment

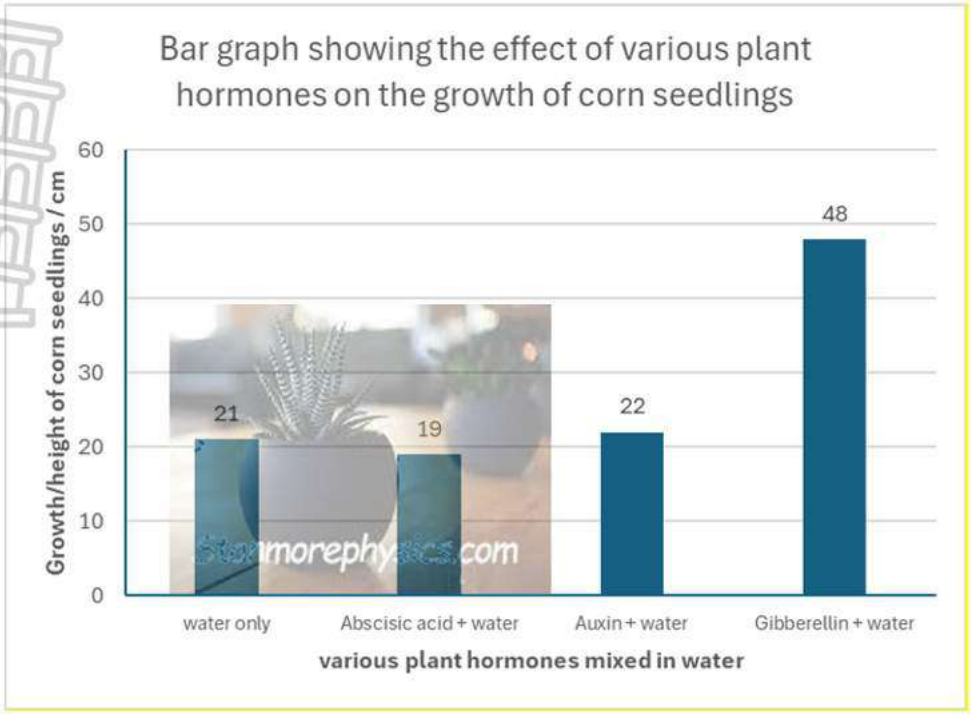
(Mark first TWO)
(**Do not accept** same environmental conditions)

(2)

2.3.3
- Promotes dormancy of seeds ✓/inhibits germination of seeds
- Inhibits growth of apical buds ✓
- Induces flowering in some plants ✓
- Promotes ageing of leaves ✓
- Stimulates the abscission/falling of leaves / fruit ✓
- Stimulates closing of stomata ✓

Any TWO (2)

2.3.4



Criteria assessment of the graph

CRITERIA	ELABORATION	SYMBOL	MARKS
Correct type of graph	Bar graph drawn	**(T)**	**1**
Caption of graph	Both variables included (the effect of different hormones on the growth /height of corn seedlings)	**(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- and Y-axes	**(S)**	**1**
Plotting of points	1 – 3 bars plotted accurately All 4 bars plotted accurately	**(P)**	**1** **2**
	TOTAL:		**6**

NOTE: If the wrong type of graph is drawn, marks will be lost for "correct type of graph".

(6)
(11)

2.4 2.4.1 (a) Vitreous humour ✓ (1)

(b) Optic nerve ✓ (1)

2.4.2
- Transparent ✓ allows light to enter the eye and reach the retina ✓
- Causes refraction /bends light ✓ toward the yellow spot ✓/retina for clear vision
- Both are convex ✓to allow for refraction ✓

(Mark first ONE only) (2)

2.4.3
- Light stimulates the cones/photorecetor in part G /retina/yellow spot ✓
- to convert light to impulses ✓
- Impulses are transmitted via H/optic nerve ✓
- to the cerebrum ✓ to be interpreted (4)

2.4.4

Table showing structural differences in the eye for near and far vision.

Object closer than 6 m	Object further than 6 m
Ciliary muscle contracts ✓	Ciliary muscle relaxed ✓
Suspensory ligaments become slack/ slacken ✓	Suspensory ligaments tighten/ become taut ✓
Lens more convex ✓	Lens less convex ✓
T ✓ table including column headings	

Mark first TWO only **(5)**

(13)

[50]

QUESTION 3

3.1 3.1.1 2,2 ✓ hours ✓ (accept between 2,1 and 2,5 hours) (2)

3.1.2 Time it took for the blood alcohol levels to return to normal ✓/Blood alcohol concentration (1)

3.1.3
- To ensure that all participants started the investigation with no alcohol in their blood ✓
- To ensure the validity ✓of the investigation.
- To ensure that all participants begin the investigation with the same/zero blood alcohol concentration ✓
- To allow enough time for blood alcohol concentration to reach zero ✓

(Mark first TWO only) (2)

3.1.4 (a)
- Ensure that no participant is pregnant or breastfeeding ✓
- Ensure the participants are not allergic to alcohol ✓/no adverse reactions to alcohol
- Ensure participants do not drive ✓/operate heavy machinery/engage in activities that require concentration during and after the investigation

(Mark first TWO only) (2)

(b)
- Ask participants for permission to be part of the investigation ✓
- Decide how many participants to include ✓
- Decide on the age of participants ✓
- Decide on the weight of participants ✓
- Decide on the volumes of alcohol to be consumed ✓
- Decide on equipment✓/how to monitor blood alcohol concentration
- Decide on a suitable venue for the investigation ✓
- Decide on how to record data ✓
- Decide on a time to do the investigation ✓
- Ensure participants do not have a history of alcohol abuse ✓

(Mark first TWO only) (2)

3.1.5 (a) No ✓ (1)

(b)
- Only 1 participant per volume of alcohol ✓✓
- The investigation was not repeated ✓✓

(Mark first ONE only) (2)

3.1.6 The higher the volume of alcohol consumed the longer it takes to reduce blood alcohol concentration ✓✓ (2)

(14)

3.2 3.2.1 (a) Tympanic membrane ✓ (1)
(b) Cochlea ✓/organ of Corti (1)
(c) Eustachian tube ✓ (1)
(d) Auditory canal ✓ (1)

3.2.2
- The AirPods block the auditory canal ✓ and prevent the sound waves from the environment from reaching the tympanic membrane ✓
- The sound from the AirPods is too loud ✓ and the environmental noise is too quiet/soft by comparison, so it is not detected ✓

(Each point must have a linked cause and effect statement.) (4)

3.2.3 (a) Fred ✓ (1)
(b) (Fred's) volume is 92 dB ✓/over 80 dB
Which is more than the safe level ✓ of 80 dB (2)

(11)

3.3 3.3.1 (a) Aldosterone ✓ and adrenalin ✓ (2)
(b) Testosterone ✓ (1)

3.3.2 **Pituitary gland ✓*/hypophysis** is stimulated ✓

To secrete less TSH into the blood ✓
Low TSH levels stimulates the thyroid gland ✓
to secrete less thyroxin ✓
Thyroxin levels decrease ✓/ normal
* ✓ **Compulsory mark and FOUR other points** (5)

(8)

3.4 3.4.1 (a) Insulin ✓
(b) Blood sugar level starts decreasing ✓ (2)

3.4.2 – Maintenance of a constant internal environment within the body ✓
– Regardless of changes in the internal or external environment ✓ (2)

3.4.3 QUESTION REMOVED, THE PAPER WILL BE MARKED OUT OF 145 ~~(5)~~

(4)

3.5 3.5.1 Hypothalamus ✓ (1)

3.5.2
- the body temperature decreases ✓because
- Blood vessels of the skin dilate ✓/vasodilation
- More blood flows to the surface of the skin ✓
- More heat is lost from the surface of the skin ✓
- More blood flows to the sweat glands ✓
- to release more sweat ✓/to become more active
- Evaporation of sweat cools the skin✓

MARK ANY (5)

3.5.3 Increase in cellular respiration ✓ in muscles
produces more energy ✓as heat (2)
(8)
[45]

TOTAL SECTION B: 95

TOTAL: 145

ADDENDUM

question	Accept
1.2.2	Stereoscopic / 3D vision
1.5.1 (a)	Amniotic sac
1.5.1 (b)	Uterine wall
2.1.2 (a)	To maintain the endometrium ✓/further thicken the endometrium
2.2.1 (a)	Sperm duct
2.2.2	2^0 C lower than body temperature /35°C
2.2.5	If learners included outside penis /into vagina after the urethra they can be awarded the marks.
2.3.2	The word SAME must be included in the answers to award mark