education

Department of Education
FREE STATE PROVINCE

GRADE 12

LIFE SCIENCES P1

June 2025

TOTAL: 150

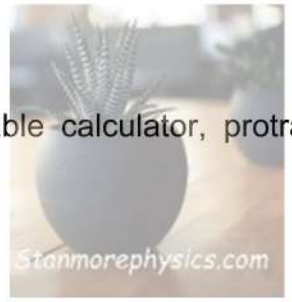
TIME: 2½ HOURS

This question paper consists of 15 pages.

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. Make ALL drawings in pencil and label them in blue or black ink.
7. Draw diagrams, tables or flow charts 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 a compass, where necessary.
11. Write neatly and legibly.



SECTION A

QUESTION 1

1.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.9) in the ANSWER BOOK, for example 1.1.10 D.

1.1.1 The structure that receives vibrations from the malleus and transmits it to the stapes.

A Ossicles
B Incus
C Tympanum
D Round window

1.1.2 The part of the female reproductive system that forms the birth canal during labour.

A Uterus
B Fallopian tube
C Vagina
D Endometrium

1.1.3 The structure in an amniotic egg that removes waste products.

A Amnion
B Allantois
C Yolk sac
D Chorion

1.1.4 The diagram below represents a cochlear implant in a human ear.

Which part of the brain is connected to the cochlear implant?

A Cerebellum
B Corpus callosum
C Cerebrum
D Medulla oblongata

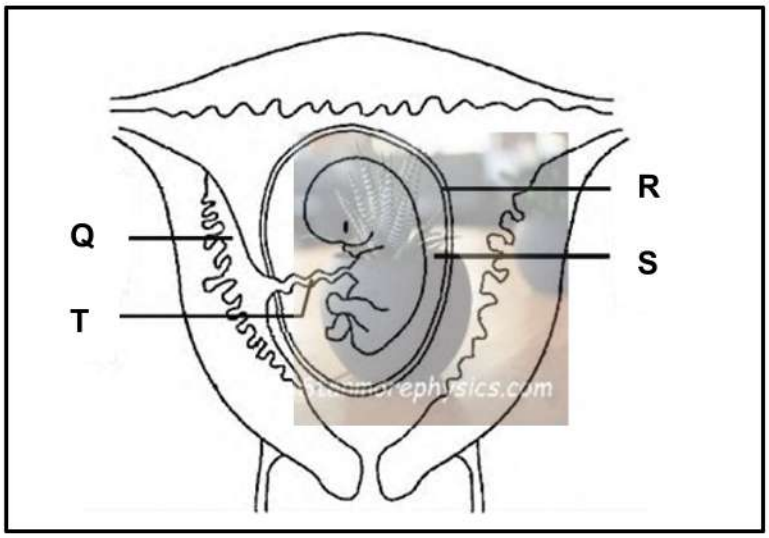
1.1.5 The cornea and the lens are both …

A opaque.
B transparent.
C elastic.
D inelastic.

1.1.6 Which ONE of the following parts secretes an alkaline fluid to neutralise the acid in the vagina?

A Scrotum
B Prostate gland
C Testis
D Vas deferens

1.1.7 **QUESTIONS 1.1.7 AND 1.1.8 ARE BASED ON THE DIAGRAM BELOW SHOWING A DEVELOPING FOETUS**



Which labelled part maintains the body temperature of the foetus?

A Q
B R
C S
D T

1.1.8 Which ONE of the following is the function of the umbilical vein in **T**.

A Carries useful products from the foetus to the placenta.
B Carries waste products from the foetus to the placenta.
C Carries waste products from the placenta to the foetus.
D Carries useful products from the placenta to the foetus.

1.1.9 The normal site of fertilisation in a human female is the …

A uterus
B ovary
C vagina
D fallopian tube (9 x 2) **(18)**

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.9) in the ANSWER BOOK.

1.2.1 The part of the male reproductive system that stores sperm cells until they are mature

1.2.2 The process where the sperm and ovum fuse inside the female's body

1.2.3 The behaviour where an organism spends time and energy to protect and feed young offspring

1.2.4 A disorder that occurs because of the body's inability to produce insulin

1.2.5 The site where oogenesis takes place in the human body

1.2.6 The functional connection between two successive neurons

1.2.7 A ball of cells that forms during embryonic development

1.2.8 The period between ages 10 and 12 years when the human sex organs develop and produce gametes

1.2.9 Finger-like projections that develops from the outer membrane of an embryo after implantation

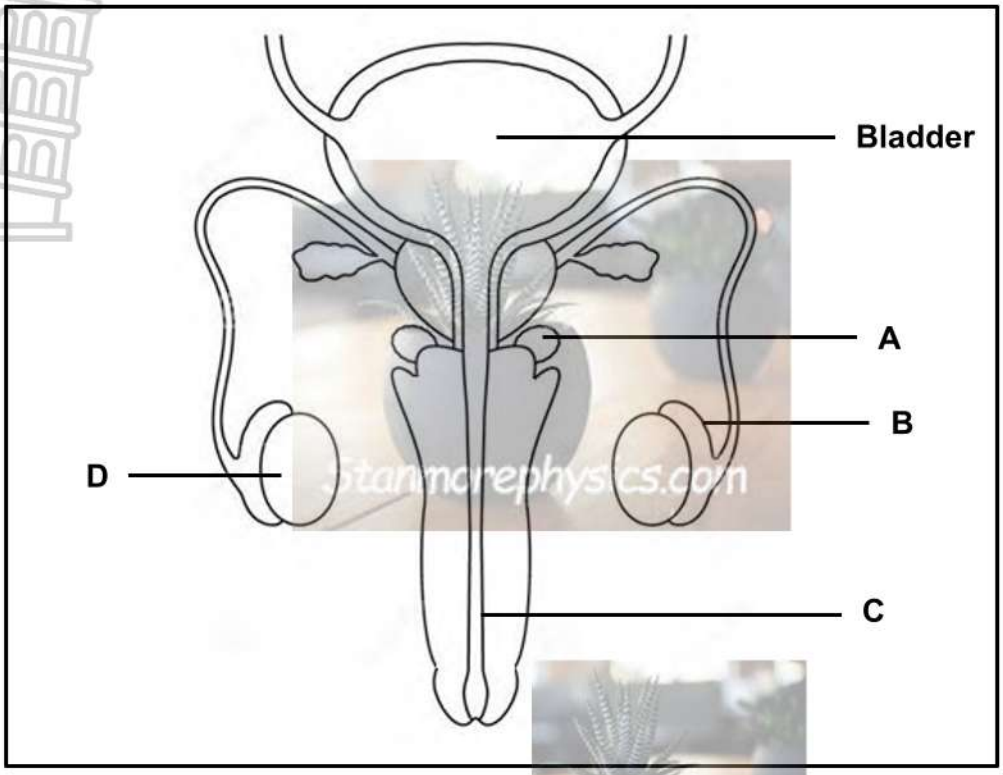
(9 x 1) **(9)**

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**, **both A and B** or **none** next to the question number (1.3.1 to 1.3.3) in the ANSWER BOOK.

	COLUMN I		COLUMN II
1.3.1	The structure in the ear that converts vibrations into pressure waves	A: B:	Tympanic membrane Oval window
1.3.2	Autonomic nervous system	A: B:	Somatic system Sympathetic & parasympathetic
1.3.3	Contains photoreceptors	A: B:	Choroid Retina

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

1.4 The diagram below represents the male reproductive system.



1.4.1 Give the **LETTER** and **NAME** of the part:

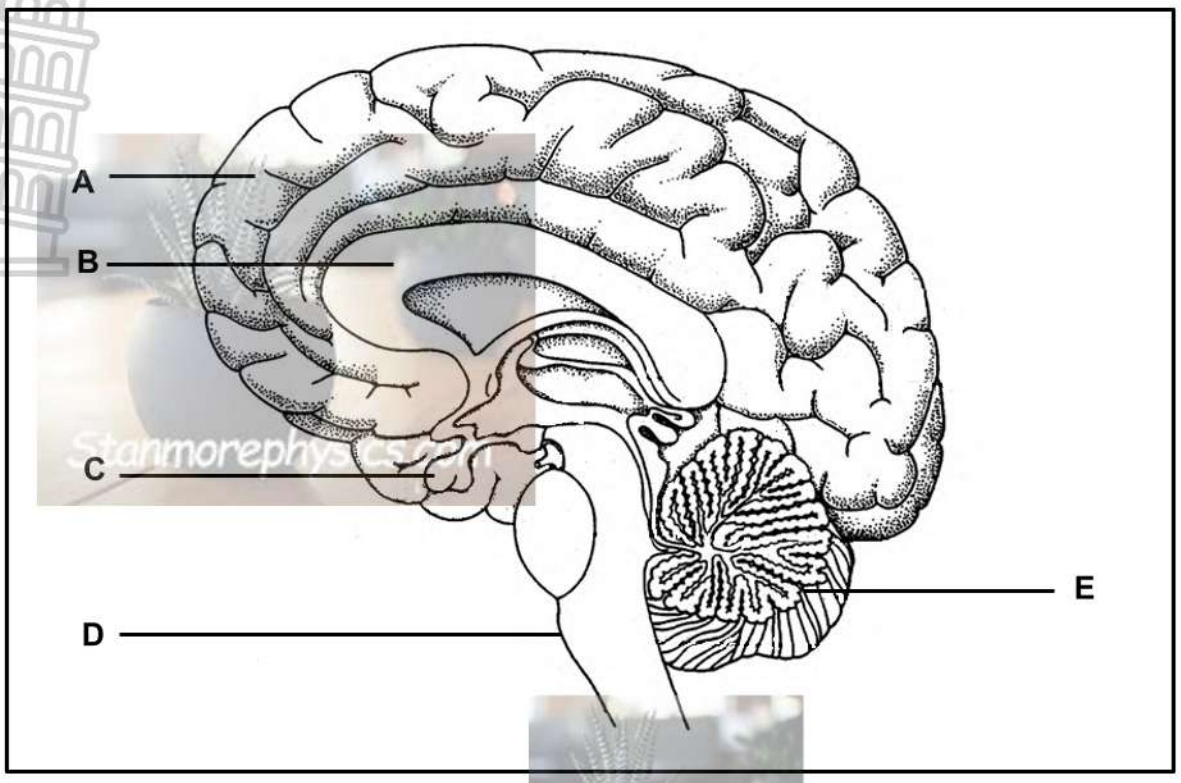
(a) Where meiosis takes place. (2)

(b) That forms part of both the urinary and reproductive systems. (2)

(c) That secrets a fluid which improves sperm movement. (2)

1.4.2 Name the hormone responsible for the development of the secondary sexual characteristics in males. (1)
(7)

1.5 The diagram below represents parts of the central nervous system.



1.5.1 Give the **LETTER** and **NAME** of the parts responsible for:

(a) Connecting the two hemispheres of the brain. (2)

(b) Heartbeat (2)

(c) Memorising (2)

1.5.2 Name the TWO components of the central nervous system shown in the diagram.? (2)

1.5.3 State TWO ways in which the brain is protected. (2)
(10)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

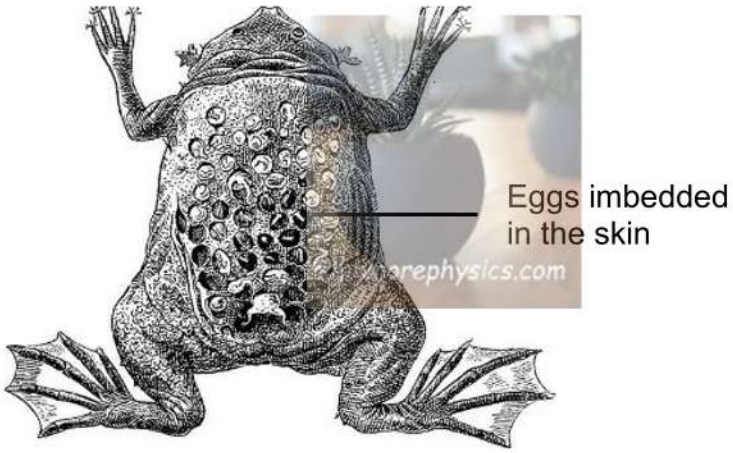
2.1 Read the extract on the reproduction of Suriname toads.

The male Suriname (*Pipa pipa*) toad makes a clicking call in the water to attract the female. The male then grasps the female from above. The skin of her back begins to thicken.

The female releases one ovum at a time and the female can have more than 100 eggs embedded in the skin of her back.

The male fertilises the eggs on her back. The skin continues to thicken around each egg so that the eggs are embedded within her skin.

The development stages from a tadpole (larvae) to a juvenile takes place inside her skin and eventually the toadlets emerge from her back by squeezing out through the openings in her skin.



2.1.1 Name the type of fertilisation that occurs during reproduction in toads. (1)

2.1.2 Explain TWO ways in which the Suriname (*Pipa pipa*) toad increases the chances of fertilisation. (4)

2.1.3 Name the type of reproductive strategy in the embryonic development that can be seen in the Suriname (*Pipa pipa*) toad. (1)
(6)

2.2 Diagram 1 below represent the development of the follicle and Diagram 2 represents the levels of hormones during the menstrual cycle.

Diagram 1

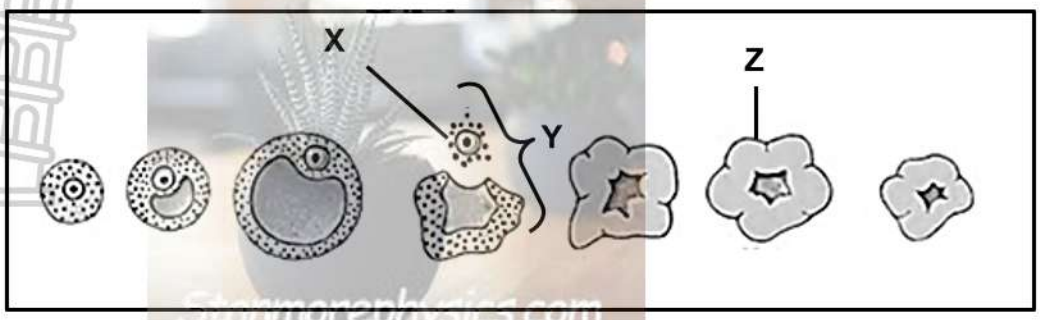
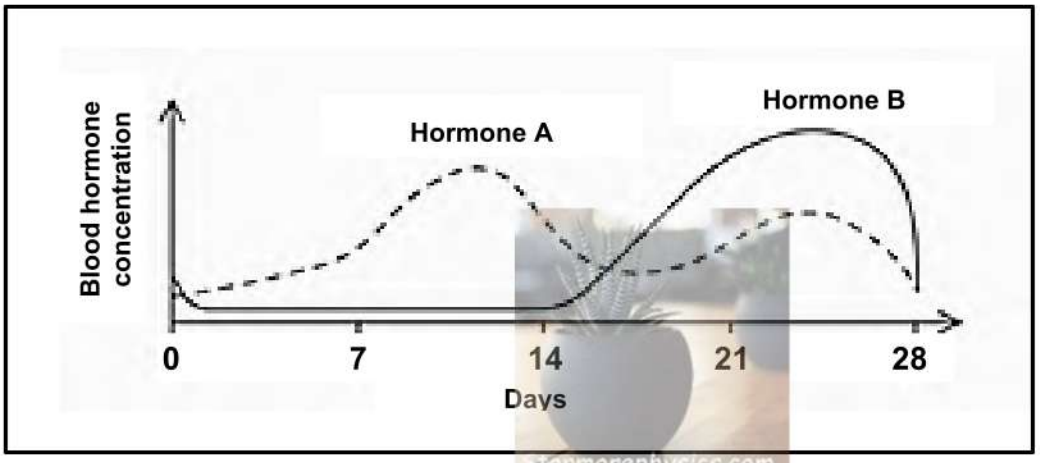


Diagram 2



2.2.1 Identify:

(a) **X** (1)

(b) Process **Y** (1)

(c) The hormone responsible for the formation of structure **Z** (1)

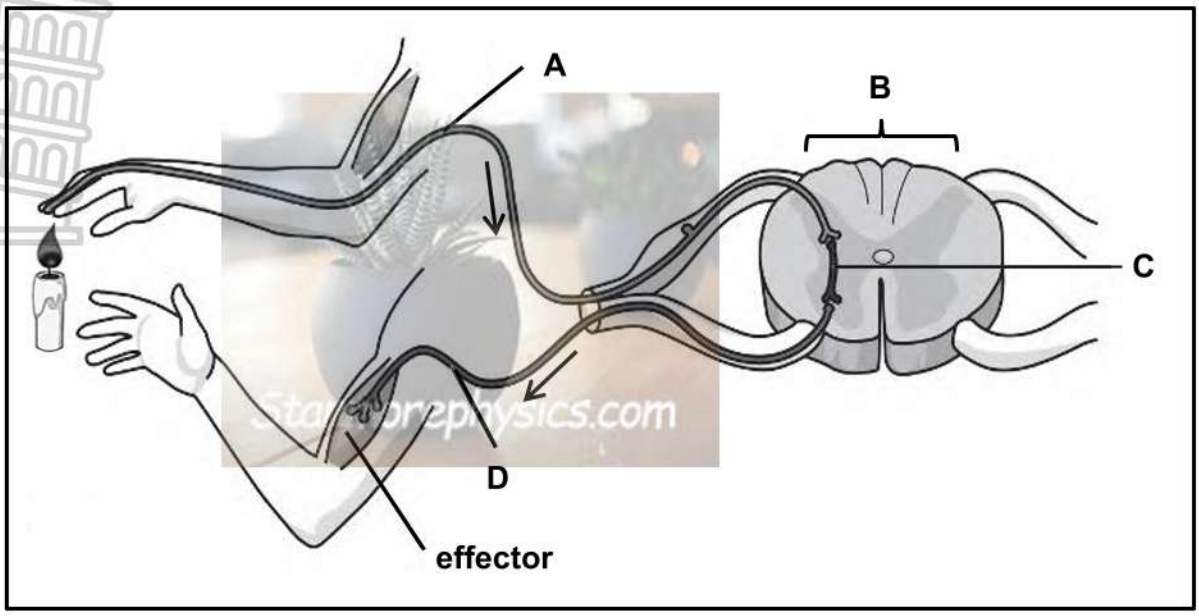
2.2.2 Name the TWO parts of the menstrual cycle. (2)

2.2.3 Give TWO **visible** reasons why this female is not pregnant. (2)

2.2.4 Describe the process of oogenesis. (5)
(12)

2.3 Give FOUR functions of the placenta. **(4)**

2.4 The diagram below shows a reflex arc. The arrows indicate the direction of nerve impulse transmission.



2.4.1 Label part **B**. (1)

2.4.2 Define a *reflex action*. (3)

2.4.3 Tabulate TWO structural differences between neuron **A** and **D**. (5)

2.4.4 Explain why the brain is not involved in this reflex action. (2)

2.4.5 If a person suffers from multiple sclerosis, explain the effect of this disease on the reflex action. (3)
(14)

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

The reproductive hormones Oestrogen and Progesterone increase the thickening of the endometrium during the menstrual cycle.

An investigation was conducted on the influence of oestrogen and progesterone on the thickening of the endometrium.

The procedure was done as follow:

- 80 females of the same age were asked to participate (20 in each group).
- The females were all healthy and not using any hormonal supplements.
- The females followed the same diet and exercise program over 10 days.

Group 1: No hormones given to the women

Group 2: Only Oestrogen was given to the women

Group 3: Only Progesterone was given to the women

Group 4: Oestrogen followed by progesterone was given to the women

Endometrium thickness was recorded every 2 days for 10 days.

Day	Control (No Hormones)	Oestrogen Only	Progesterone Only	Oestrogen + Progesterone
0	0.5 µm	0.5 µm	0.5 µm	0.5 µm
2	0.6 µm	1.2 µm	0.6 µm	1.2 µm
4	0.7 µm	2.0 µm	0.8 µm	2.0 µm
6	0.7 µm	2.5 µm	1.0 µm	3.5 µm
8	0.7 µm	2.5 µm	1.2 µm	4.0 µm
10	0.7 µm	2.5 µm	1.3 µm	4.5 µm

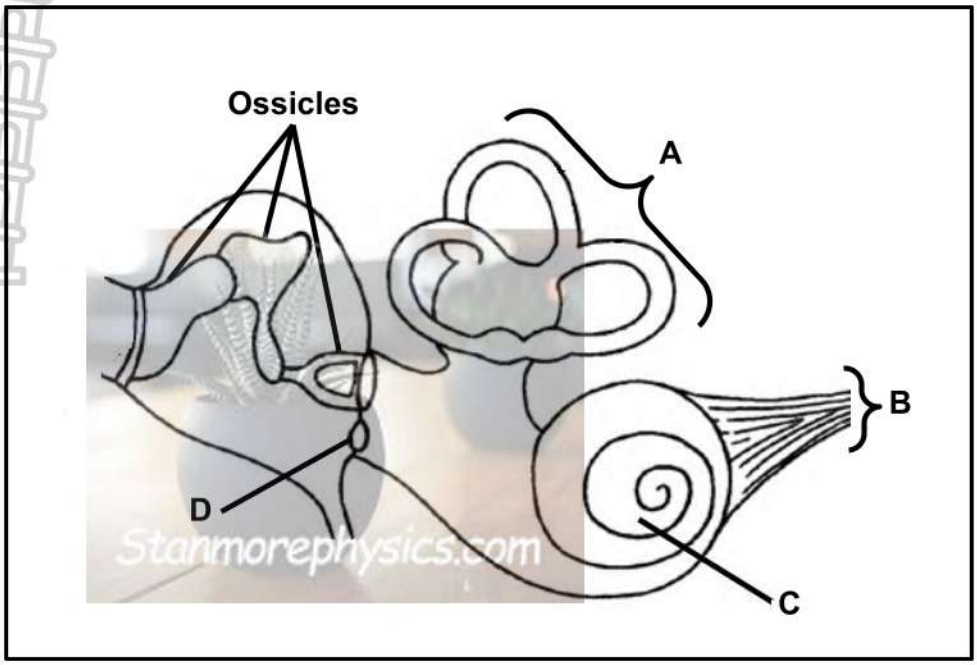
2.5.1 Identify the independent variable. (1)

2.5.2 Explain the significance of including **Group 1** in the investigation. (2)

2.5.3 State TWO ways in which the validity of the results was ensured. (2)

2.5.4 State a conclusion for this investigation. (2)
(7)

2.6 The diagram below shows different parts of the ear.



2.6.1 Identify:

(a) The TWO types of receptors in part **A** that helps to maintain balance in the human body. (2)

(b) The neuron in **B** that transmits the impulse to the cerebrum. (1)

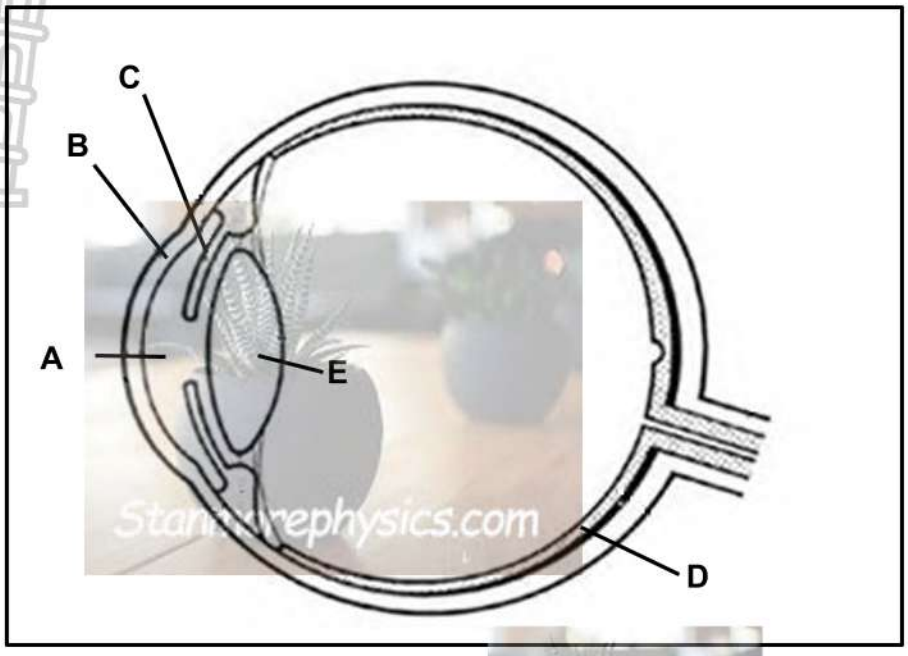
2.6.2 Give ONE function of **D**. (1)

2.6.3 Explain the role of part **C** in the interpretation of sound. (3)
(7)

TOTAL QUESTION 2: [50]

QUESTION 3

3.1 The diagram below represents the structure of the human eye.



3.1.1 Identify:

(a) Fluid **A** (1)

(b) Part **B** (1)

(c) Layer **D** (1)

3.1.2 Explain TWO structural adaptations of part **E** for its function. (4)

3.1.3 Describe the role of part **C** in the pupillary mechanism when exposed to dim light. (5)

3.1.4 Describe the changes that takes place in the eye to be able to read the time on your wristwatch. (6)
(18)

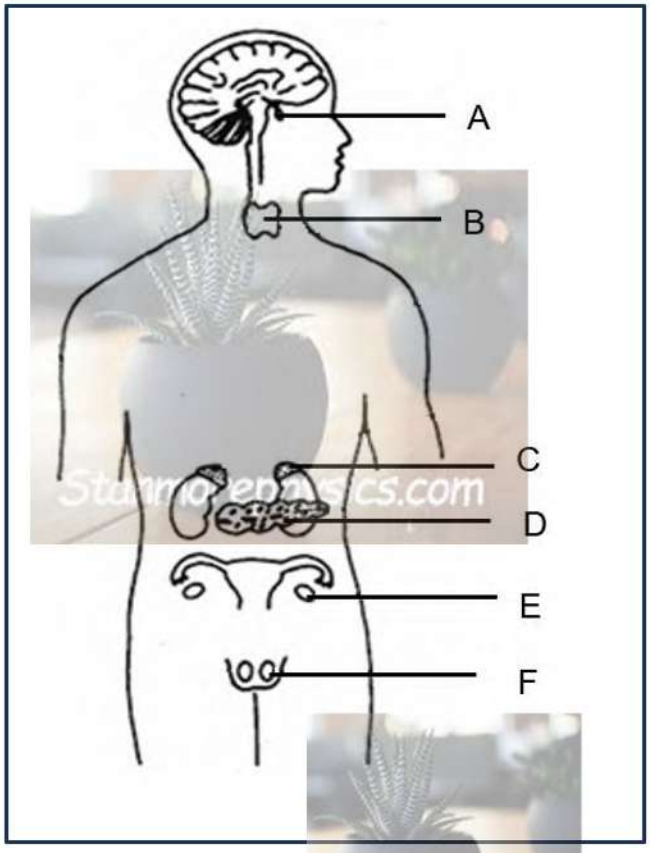
3.2 If Andrew looks at an object that is close to him, he sees it clearly and with focus. When he looks at objects far away, they are out of focus.

3.2.1 Identify the visual defect that Andrew probably has. (1)

3.2.2 Explain why Andrew sees distant objects to be out of focus. (2)
(3)

3.3 Draw a labelled diagram of a multipolar neuron. **(5)**

3.4 The diagram below represents endocrine glands in humans.



3.4.1 Give the LETTER and the NAME of the endocrine gland responsible for:

(a) Reabsorption of water. (2)

(b) Maintenance of metabolic rate. (2)

(c) Control of glucose levels in blood. (2)

3.4.2 Give the NAME of the hormone that:

(a) Stimulates follicle development in the ovary. (1)

(b) Promotes the growth of the skeleton and skeleton muscles. (1)

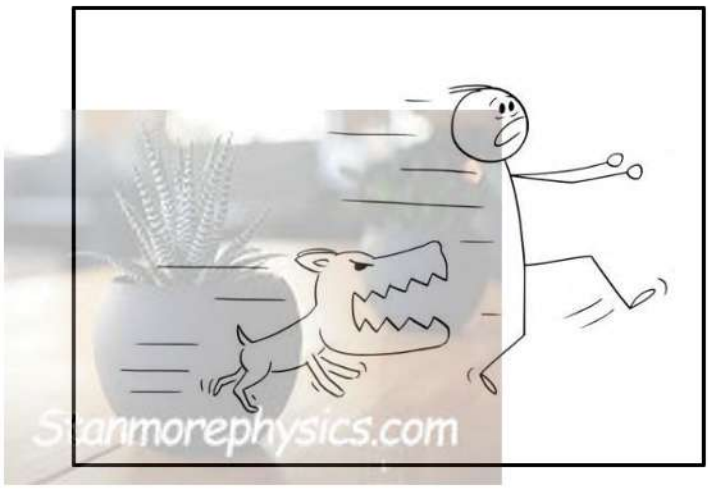
(c) Increases glucose levels in the blood. (1)

3.4.3 Name the disorder caused by an imbalance in thyroxin levels. (1)

3.4.4 Explain why the pancreas is considered both an exocrine and endocrine gland. (4)

(14)

3.5 The diagram below represents a "fight or flight" reaction that is controlled by hormones.



3.5.1 Give THREE characteristics of hormones. (3)

3.5.2 Identify the hormone responsible for the "fight and flight" reaction. (1)

3.5.3 Explain THREE effects of the hormone in QUESTION 3.5.1. (6)
(10)

TOTAL QUESTION 3: [50]
TOTAL SECTION B: 100
GRAND TOTAL: 150

education

Department of Education
FREE STATE PROVINCE

GRADE 12

LIFE SCIENCES

JUNE 2025

TOTAL: 150

MARKING GUIDELINES- with alternative options.(6 June 2025)

These marking guidelines consist of 9 pages.

PRINCIPLES OF MARKING LIFE SCIENCES

1. **If more information than the mark allocation is given**
   Stop marking after the maximum points have been obtained and draw a squiggly line indicating 'max' points in the right hand margin.

2. **If, for example, three reasons are required and five are given.**
   Mark only the first three regardless of whether all or some are correct/incorrect.

3. **If the whole process is described while only a part is required**
   Read everything and credit the relevant parts.

4. **If comparisons are required but descriptions are given**
   Accept if the differences/similarities are clear.

5. **If tabulation is required and paragraphs are given**
   Candidates will forfeit marks if not tabulated.

6. **If annotated diagrams are presented instead of descriptions required**
   Candidates will forfeit marks.

7. **If flowcharts are presented instead of descriptions**
   Candidates will forfeit marks.

8. **If the sequence is vague and links do not make sense**
   Credit where sequence and links are correct. Where sequence and links are not correct, do not credit. If the sequence is correct again, continue to credit.

9. **Unrecognized abbreviations**
   Accept if it is described at the beginning of the answer. If it is not defined, do not credit the unrecognized abbreviation, but credit the rest of the answer if it is correct.

10. **Wrongly numbered**
    If the answers match the correct order of the questions, they are acceptable.

11. **If the language used changes the intended meaning**
    Don't accept.

12. **Spelling errors**
    Accept if recognizable, provided it does not mean something else in Life Sciences or is out of context.

13. **If common names are given in terminology**
    Accept, if accepted at the memo discussion.

14. **If only letter is required and only the name is given (and vice versa)**
    No credit.

15. **If units of measure are not indicated**
Candidates will forfeit marks. Memorandum will indicate separate points for units.

16. **Be sensitive to the meaning of the answer, which can sometimes be presented in different ways**

17. **Heading**
All illustrations (such as diagrams, drawings, graphs, tables, etc.) must be captioned.

18. **Mixing of official languages (terms and concepts)**
A single word or two in any other official language other than the learner's language of assessment in which most of his/her answers are presented must be credited, if correct. A marker proficient in the relevant official language should be consulted. This applies to all official languages.

SECTION A

QUESTION 1

1.1	1.1.1	B ✓✓		
	1.1.2	C ✓✓		
	1.1.3	B ✓✓		
	1.1.4	C ✓✓		
	1.1.5	B ✓✓		
	1.1.6	B ✓✓		
	1.1.7	C ✓✓		
	1.1.8	D ✓✓		
	1.1.9	D ✓✓	(9 x 2)	**(18)**
1.2	1.2.1	Epididymis✓		
	1.2.2	Internal fertilisation✓ (Not fertilisation)		
	1.2.3	Parental care✓/ ~~Parenting~~ X		
	1.2.4	Diabetes✓mellitus		
	1.2.5	Ovaries✓		
	1.2.6	Synapse✓		
	1.2.7	Morula✓		
	1.2.8	Puberty✓		
	1.2.9	Chorionic villi✓	(9 x 1)	**(9)**
1.3	1.3.1	B only ✓✓		
	1.3.2	B only ✓✓		
	1.3.3	B only ✓✓	(3 x 2)	**(6)**
1.4	1.4.1	(a) D✓ Testis✓		(2)
		(b) C✓ Urethra✓		(2)
		(c) A✓ Cowper gland✓		(2)
	1.4.2	Testosterone ✓		(1)
				(10)
1.5	1.5.1	(a) B✓ Corpus callosum✓		(2)
		(b) D✓ Medulla Oblongata✓		(2)
		(c) A✓ Cerebrum✓		(2)
	1.5.2	- Brain✓ - Spinal cord✓ **(Mark first TWO only)**		(2)
	1.5.3	- Cranium✓ - Meninges✓ - Cerebrospinal fluid✓ **(Mark first TWO only)**	Any	(2) **(10)**
			TOTAL SECTION A:	**50**

SECTION B

QUESTION 2

2.1 2.1.1 External✓ fertilisation (1)

2.1.2 - 100 eggs are released✓ because the ova can be washed away✓/eaten by predators
- The male grasp onto the female✓ so that the sperm is release on the ova✓/in proximity of the ova.
- Eggs are imbedded in the back of the female✓ to protect✓ the eggs from predators Any (4)

2 x 2
(Mark first TWO only)

2.1.3 Ovipary✓ (1)
(6)

2.2

2.2.1 (a) Ovum✓
(b) Ovulation✓
(c) LH✓/(Luteinising hormone) (3)

2.2.2 - Ovarian✓ cycle
- Uterine✓ cycle (2)
(Mark first TWO only)

2.2.3 Hormone **B**/Progesterone decreases✓ to 28 days
The corpus luteum disintegrate✓ (2)
(Mark first TWO only)

2.2.4 - Diploid cells in the ovary undergo mitosis✓
- to form numerous follicles✓
- At the onset of puberty✓
- and under the influence of FSH✓
- one cell inside a follicle enlarges and undergoes meiosis✓
- Of the four cells that are produced, only one survives
- to form a mature, haploid ovum✓ (5)
- This occurs in a monthly cycle✓ Any **(12)**

2.3

- Nutrition of the fetus✓
- Excretion✓
- Gas exchange✓
- Acts as a microfilter✓
- Endocrine function✓/Secrete progesterone (4)
- The point of attachment to the mother✓ Any

(Mark first FOUR only)

2.4 2.4.1 Spinal cord✓ (1)

2.4.2 Rapid✓/Quick/Fast, automatic✓ reaction to a stimulus✓ (3)

2.4.3

Neuron A/ Sensory neuron	Neuron D/ Motor neuron
Monopolar neuron✓/ One outgrowth from the cell body	Multipolar neuron✓/ Multiple outgrowths from the cell body
Both the dendrite and axon cover with a myelin sheath✓	Only the axon is covered with a myelin sheath✓
The dendrites are long and the axon is short✓	The dendrites are short, and the axon are long✓
The cell body is in the middle of the neuron✓	The cell body is at the end of a neuron✓

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

2.4.4
- The spinal cord shortens the reaction time by sending impulses directly to the effector✓
- If the brain is involved, it delays the reaction✓
- Causing injury✓/being burned Any (2)

(Mark first TWO only)

2.5 2.4.5
- This will cause a slow/ transmission of impulses✓
- The myelin sheath is damaged✓ by multiple sclerosis
- Resulting in a slow reaction time✓ (3)

(14)

2.5.1 Oestrogen and progesterone✓ (1)

2.5.2
- The control✓
- to ensure that oestrogen and progesterone are responsible for the thickening of the endometrium✓ (2)

2.5.3
- same diet✓
- same exercise✓
- same age✓
- same period✓/ of 10 days
- healthy humans✓
- Same gender Any (2)

2.6 **(Mark first TWO only)**

2.5.4 Oestrogen and progesterone increase the thickness of the endometrium more than only oestrogen of progesterone.✓✓ (2)

(7)

(2)

2.6.1 (a) Crista✓ (1)
Maculae✓

(b) Sensory✓ neuron

(1)

2.6.2 - Preventing echoes from forming✓
- Absorb excess pressure waves from the inner ear ✓
Any
(Mark first ONE only) (3)
(7)

2.6.3 - The organ of Corti will be stimulated✓
- To convert the pressure waves✓ to
- impulses✓

Total Question 2 [50]

QUESTION 3

3.1 3.1.1 (a) Aqueous humour✓ (1)
(b) Cornea✓ (1)
(c) Retina✓ (1)

3.1.2 - Elastic✓
The lens changes shape✓ to allow for accommodation
- Convex✓
To refract the light rays on the retina✓
- Transparent✓
To allow light to pass through✓ to the retina Any (2x2) (4)
(Mark first TWO only)

3.1.3 - The circular muscles of the (iris) relax✓ and
- The radial muscles of the (iris) contract✓
- The pupil dilates✓/diameter enlarger
- So that more light enters the eye✓
- To be focused on the retina✓ (5)

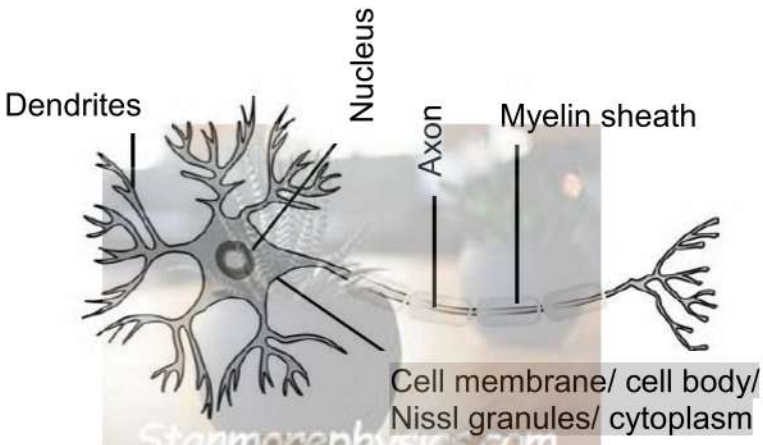
3.1.4 - Ciliary muscle contract✓
- Ciliary body move towards lens✓
- Suspensory ligaments slacken✓ (loosen)
- Tension on the lens decreases✓
- Lens become more convex✓
- This causes light rays to bend more✓
- to focus on the retina✓ and form a clear image (6)
(18)

3.2 3.2.1 Short-sightedness✓/myopia (1)

3.2.2 -The eyeball is to long✓/cornea is too convex, so the light rays are refracted more and the
- light rays focus in front of the retina✓ and not on the retina, so no clear image is formed (2)
-The inability of the lens to become less convex ✓ **(3)**

3.3

Multipolar neuron/ Motor neuron



Heading of the diagram (C)	1
Correct type of diagram/neuron (T)	1
Any 1 label (L)	1
Any 2 label (L)	2
Any 3 labels (L)	3

(5)

3.4 3.4.1 (a) A✓ - Pituitary gland✓/Hypophysis (2)

(b) B✓ - Thyroid gland✓ (2)

(c) D✓ - Pancreas✓ (2)

3.4.2 (a) FSH✓/ Folic stimulating hormone (1)

(b) Growth hormone✓/GH (1)

(c) Glucagon✓ (1)

3.4.3 Goiter✓/ Goitre (1)

3.4.4 Pancreases secrete pancreatic juice✓/enzymes through duct✓
Pancreases secrete hormones✓/(insulin and glucagon) directly in the blood✓ Any (2x2) (4)
(14)

3.5 3.5.1 - Chemical messengers✓
- Proteins✓/(Organic Compound)
- Small quantities needed✓

- Transport to target organs✓
- Hormones are stimulatory or inhibitory✓/ Negative feedback
- Transport via the blood stream ✓

Any (3)

(Mark first THREE only) (1)

3.5.2 Adrenalin✓

3.5.3
- Increases heart rate✓ leading to a increased blood pressure supplies more glucose and O_2 for cell respiration✓
- Stimulates the liver to convert more glycogen into glucose✓ to provide more glucose for cell reparation✓
- Blood supply to the skeletal muscles and heart muscle increases✓ so that muscle cells get more glucose and O_2 for cell respiration✓
- Pupils dilate✓ and more light enters the eye to focus the light rays on the retina to form a clear image✓
- Blood vessel in skin narrows✓/vasoconstriction and less blood goes to skin and intestines and more blood to the muscle cells for cell respiration✓ (6)
- Breathing rate and depth increase✓ to supply more O_2 for cell respiration✓ **(10)**
- Body cells✓ – Increased metabolic rate✓ Any (2x3)

(Mark first THREE only)

Total Question 3: [50]

TOTAL SECTION B: 100

GRAND TOTAL: 150