



LIMPOPO

PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

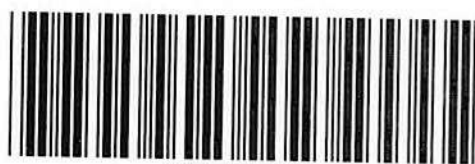
**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

**LIFE SCIENCES PAPER 1
SEPTEMBER 2026**

MARKS: 150

DURATION: 2½ HOURS



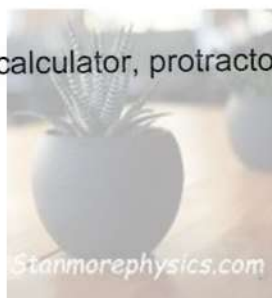
PELFSCP1

This question paper consists of 17 pages

INSTRUCTIONS AND INFORMATION

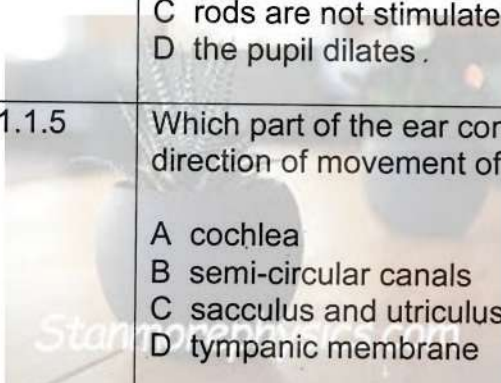
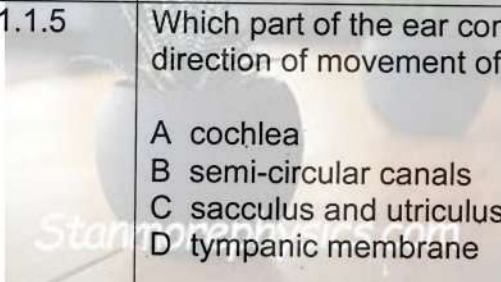
Read the following instructions carefully before answering the questions.

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. 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 to 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	On a hot day ... A vasoconstriction takes place. B less blood flows to the surface of the skin. C the sweat glands become inactive. D more blood flows to the surface of the skin.	
1.1.2	An athlete experiences a slight speech and visual disturbances after a serious head injury. Which part of the central nervous system may possibly be damaged? A Corpus callosum B Spinal cord C Cerebrum D Cerebellum 	
1.1.3	The microscopic gap between two consecutive neurons is called a/an ... A Ganglion B Synapse C Dendrite D Axon	
1.1.4	Colour vision is difficult at night because under dim light conditions... A cones are not stimulated B the lens cannot change shape C rods are not stimulated D the pupil dilates. 	
1.1.5	Which part of the ear contains receptors that detect changes in speed and direction of movement of the head? A cochlea B semi-circular canals C sacculus and utriculus D tympanic membrane 	

1.1.6

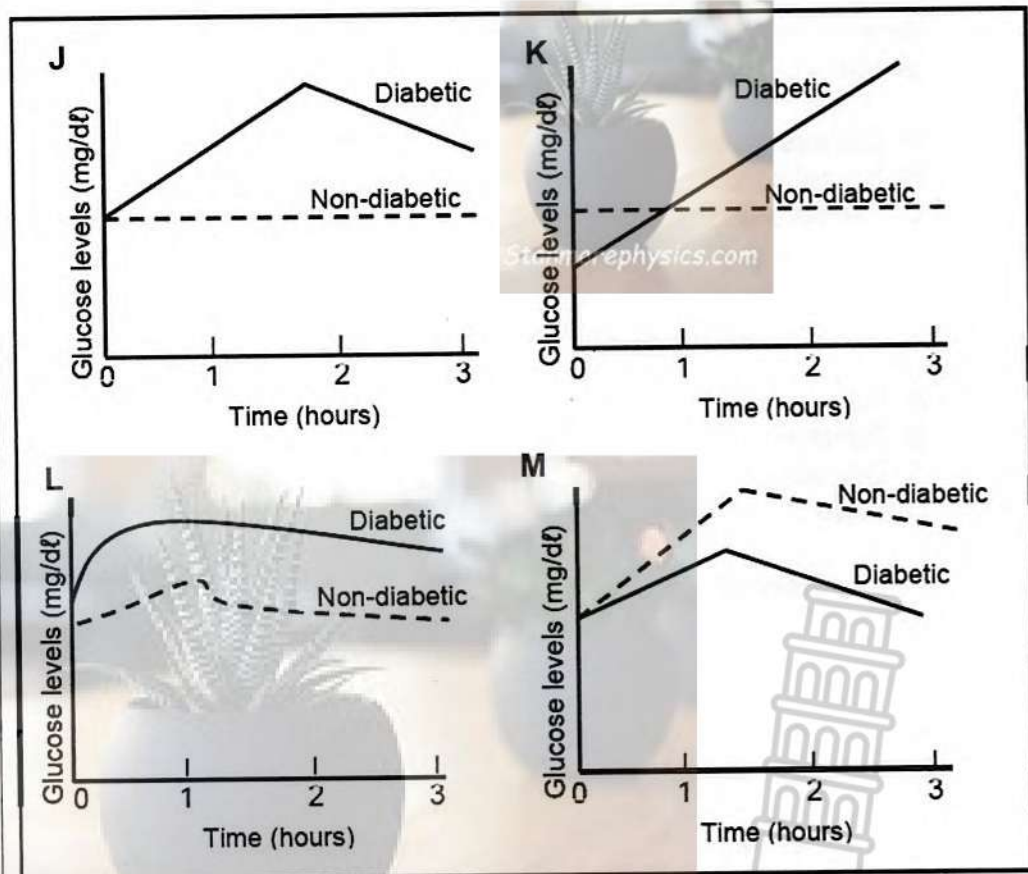
An acrosome has ...

- A mitochondria to produce energy for the movement of the sperm.
 B chromosomes that carry genes.
 C enzymes needed to penetrate the ovum.
 D a tail to facilitate the movement of sperm.

1.1.7

Two women, were given a glucose-rich drink at the same time (0 hours). One woman is diabetic and the other one is non-diabetic. The diabetic did not receive any medical treatment. Their blood glucose levels were measured over a period of 3 hours

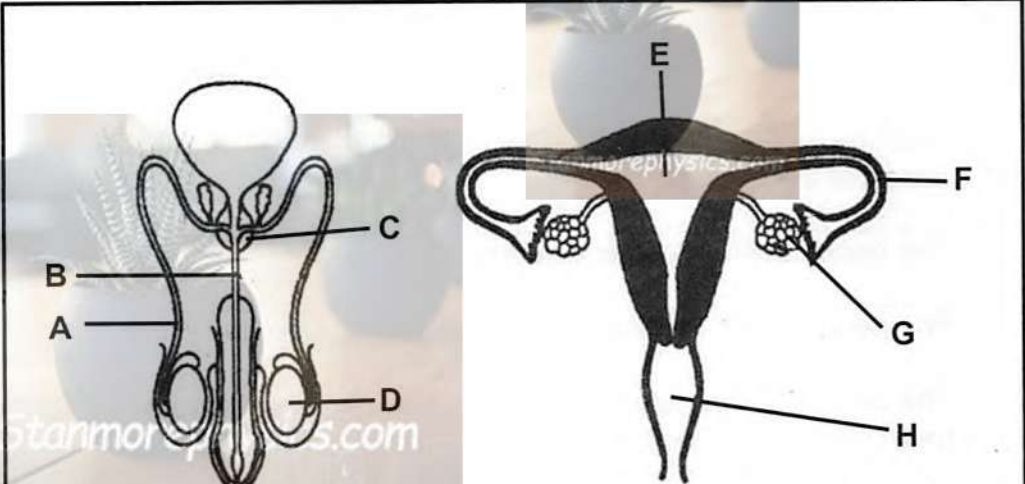
The graphs below show the possible blood glucose levels of the two women during this time.

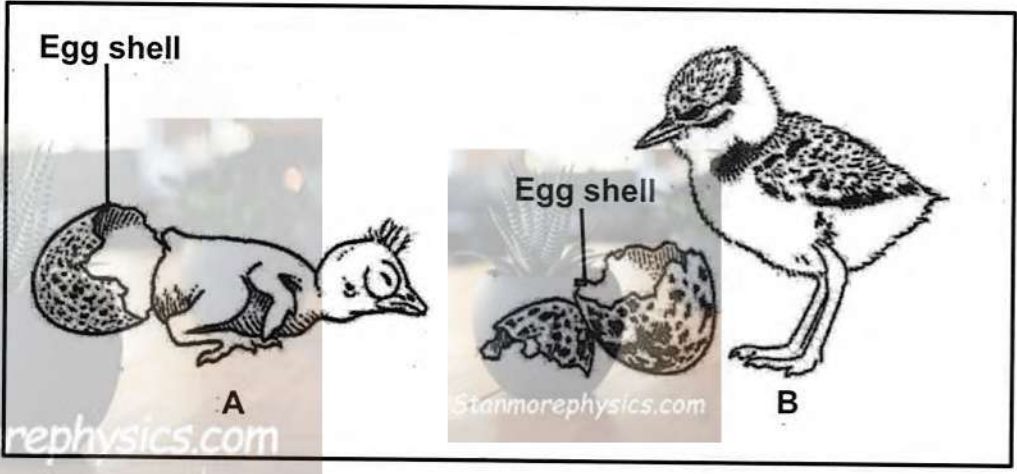


Which ONE of the graphs correctly represents the blood glucose levels of the two women?

- A J
 B K
 C L
 D M

1.1.8	A function of gibberellins in plants is to...	
	A inhibit the germination of seeds. B stimulate the germination of seeds. C promote the ageing of leaves. D promote the dormancy of lateral buds.	
1.1.9	Which ONE of the following methods of reproduction involves the development of the embryo inside an egg that is retained within the mother's body?	
	A Vivipary B Ovovivipary C Parental care D Ovipary	
	(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 numbers (1.2.1 to 1.2.10) in the ANSWER BOOK.	
1.2.1	A hollow ball of cells into which the fertilised ovum develops	
1.2.2	A structure in the eye that protects the internal parts and maintains the shape of the eyeball	
1.2.3	The homeostatic process whereby temperature is controlled in the body	
1.2.4	The period when the human sex organs develop and produce gametes	
1.2.5	The branch of the autonomic nervous system that restores an increased heart rate back to normal	
1.2.6	The type of cell division by which the zygote becomes multicellular	
1.2.7	A plant hormone that brings about dormancy of seeds and apical buds in plants	
1.2.8	A collective name for the membranes that covers the brain and spinal cord	
1.2.9	A movement of part of a plant in response to gravity	
1.2.10	A type of vision in which both eyes are used to focus on an object	
	(10 x 1)	(10)

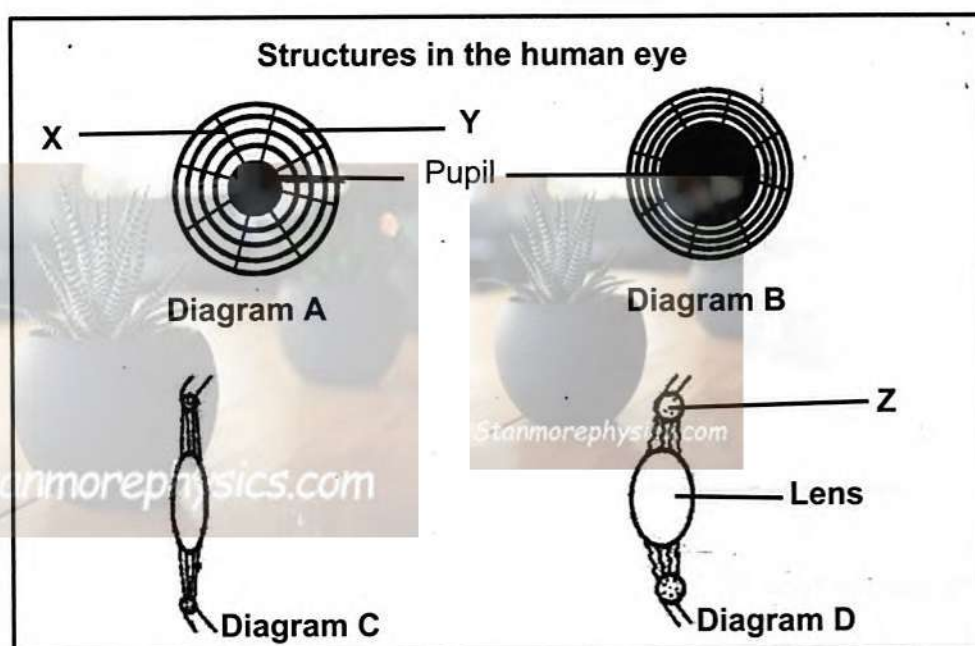
1.3	Indicate whether each of the descriptions in COLUMN I apply to A ONLY , B ONLY , BOTH A AND B or NONE of the items in COLUMN II. Write A only , B only , both A and B or none next to the question number (1.3.1 to 1.3.3) in the ANSWER BOOK.													
	<table border="1"> <thead> <tr> <th data-bbox="165 421 272 452"></th><th data-bbox="272 421 890 452">COLUMN I</th><th data-bbox="890 421 1362 452">COLUMN II</th></tr> </thead> <tbody> <tr> <td data-bbox="165 452 272 562">1.3.1</td><td data-bbox="272 452 890 562">Acts both as an exocrine and endocrine gland</td><td data-bbox="890 452 1362 562">A: Thyroid gland B: Pancreas</td></tr> <tr> <td data-bbox="165 562 272 672">1.3.2</td><td data-bbox="272 562 890 672">Equalises pressure on both sides of the tympanic membrane</td><td data-bbox="890 562 1362 672">A: Organ of corti B: Oval window</td></tr> <tr> <td data-bbox="165 672 272 786">1.3.3</td><td data-bbox="272 672 890 786">A hormone that regulates the amount of salt in the human body</td><td data-bbox="890 672 1362 786">A: ADH B: Aldosterone</td></tr> </tbody> </table>		COLUMN I	COLUMN II	1.3.1	Acts both as an exocrine and endocrine gland	A: Thyroid gland B: Pancreas	1.3.2	Equalises pressure on both sides of the tympanic membrane	A: Organ of corti B: Oval window	1.3.3	A hormone that regulates the amount of salt in the human body	A: ADH B: Aldosterone	
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1.3.1	Acts both as an exocrine and endocrine gland	A: Thyroid gland B: Pancreas												
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1.3.3	A hormone that regulates the amount of salt in the human body	A: ADH B: Aldosterone												
	(3 X 2)	(6)												
1.4	The diagrams below represent the male and female reproductive systems.  Male Reproductive System Female Reproductive System													
1.4.1	Identify part: (a) A (b) B (c) F	(1) (1) (1)												
1.4.2	Give the LETTER ONLY of the part where the foetus develops inside the female reproductive system.	(1)												
1.4.3	Give the LETTER and NAME of the part that...													

	(a) Secretes an alkaline fluid that neutralises acids in the vagina.	(2)
	(b) Receives the penis during copulation.	(2)
1.4.4	Name the type of gametogenesis that takes place in part G .	(1)
1.4.5	If there are 23 chromosomes in the nucleus of a sperm cell, how many chromosomes would there be in the nucleus of cells of part A ?	(1)
		(10)
1.5	The diagrams below show one-day hatchlings of two bird species. 	
1.5.1	Name the type of:	
	(a) egg represented in diagram A and B .	(1)
	(b) fertilisation that takes place in the bird species.	(1)
1.5.2	What are the structures that covers the body of the young in diagram B called?	(1)
1.5.3	Name the type of development strategy shown in diagram A .	(1)
1.5.4	Give the name of the extra-embryonic membrane that removes waste products from the developing embryos of the two organisms.	(1)
1.5.5	In which diagram (A or B) would you expect the yolk content of the egg to be more?	(1)
		(6)
	TOTAL SECTION A:	[50]

SECTION B**QUESTION 2**

2.1

The diagrams below show structures in the human eye.



2.1.1 Identify part:

(a) X

(1)

(b) Y

(1)

(c) Z

(1)

2.1.2 Give the LETTER only of the diagram that represents the eye...

(a) In dim light

(1)

(b) When looking at an object more than six metres away

(1)

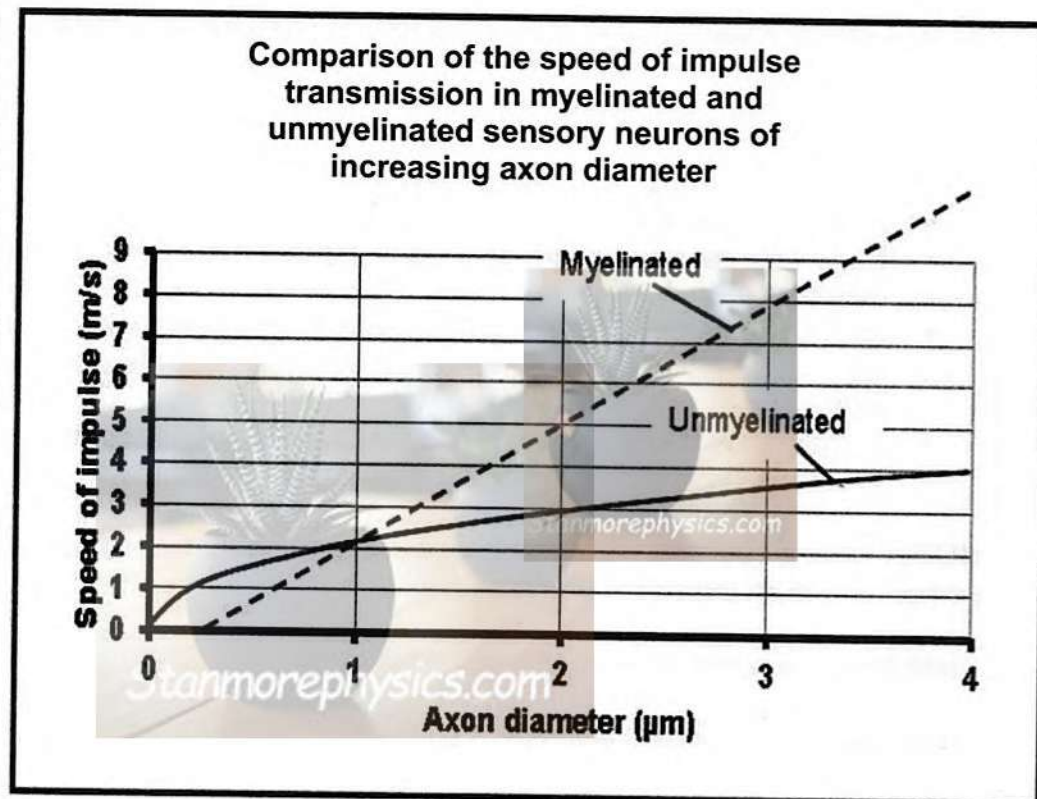
2.1.3 Name and describe the process that is responsible for the eye mentioned in QUESTION 2.1.2 (b).

(6)

(11)

2.2

The graph below shows the speed at which impulses are transmitted along sensory neuron axons of increasing diameter when the axons are myelinated (covered with myelin sheath) and unmyelinated (no myelin sheath).



2.2.1 What is a reflex action?

(2)

2.2.2 Describe the direction of the impulse within a neuron

(2)

2.2.3 Give the diameter range (in μm) when the speed of the impulse is faster in unmyelinated axons than myelinated axons.

(1)

2.2.4 Describe the relationship between the axon diameter and speed of impulses in myelinated axons.

(2)

2.2.5 Use the evidence from the graph to explain the effect of multiple sclerosis on a sufferer whose motor neuron axons are greater than $1\mu\text{m}$ in diameter.

(3)

(10)

2.3		Male hormone contraceptive (birth control) pills have been in development for over 50 years. The pill contains a substance called TU, which inhibits the secretion of testosterone. There is, however, no product available on the market yet, mainly due to many side effects associated with the product. An investigation was done to determine how TU affects male fertility. The procedure was as follows: ▪ 300 healthy, male volunteers were selected. ▪ A sperm count for each volunteer was done initially. ▪ Each volunteer was given 450 mg of TU monthly over a period of 12 months. ▪ During the period of the investigation, the volunteers were asked to wear loose-fitting trousers and underwear made of the same light fabric. ▪ A sperm count was done weekly over a period of 24 months. ▪ The average sperm count was calculated per volunteer. NOTE: Sperm count refers to the total number of healthy sperm per ml of semen and is an indication of male fertility.	
2.3.1		State the dependent variable in this investigation.	(1)
2.3.2		State how the dependent variable in QUESTION 2.3.1 was measured.	(1)
2.3.3		Name TWO other factors that should be considered when selecting volunteers.	(2)
2.3.4		Explain why wearing tight-fitting trousers will decrease male fertility.	(2)
2.3.5		Explain how TU reduces fertility.	(2)
2.3.6		Suggest ONE reason for doing the sperm count for an additional 12 months after stopping the TU treatment.	(1)
			(9)

2.4

An investigation was conducted to determine the effect of light on the growth of young plant stems.

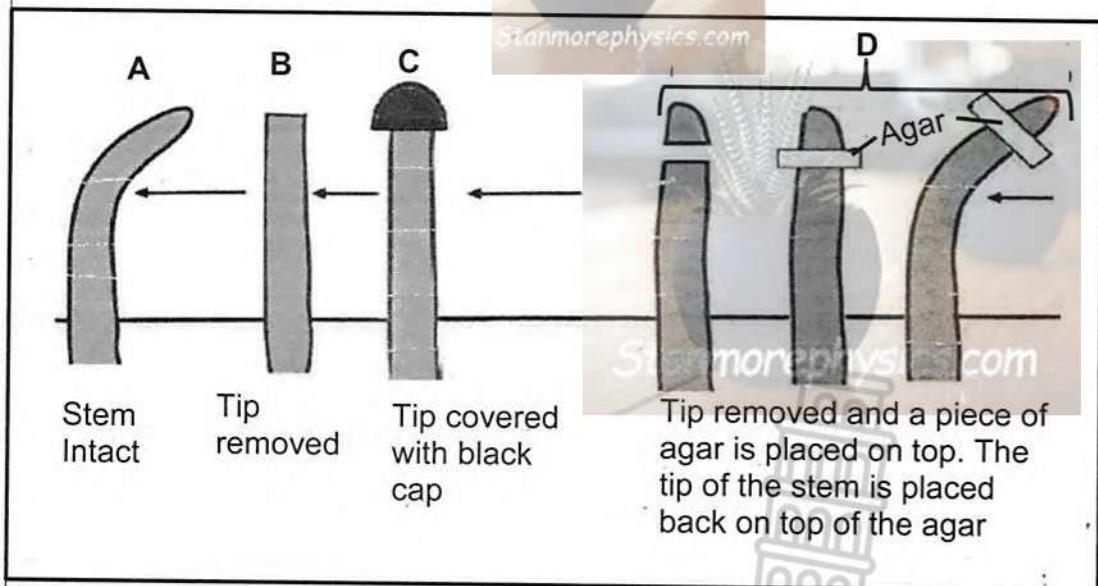
The procedure was as follows:

- A group of stems were exposed to a unilateral light.

The stem tips were treated differently.

- Stem **A**, the tip was left not removed.
- Stem **B**, the tip was removed.
- Stem **C**, the tip was covered with a black cap.
- Stem **D**, the tip was removed, and agar (jelly-like substance) was placed between the tip and the stem.

The diagrams below show the different treatments and results. The arrows indicate the position of a unilateral light source.



2.4.1

Name the growth hormone that causes the growth movements as shown in the diagrams.

(1)

2.4.2

Explain why stem **D** grows towards the light source.

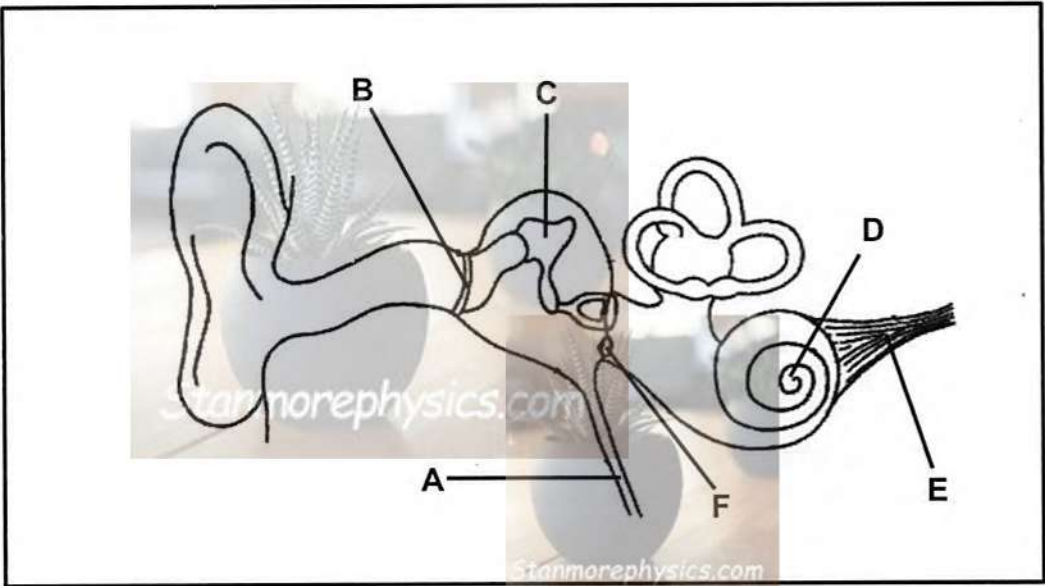
(5)

2.4.3

Explain the result of the experiment in stem **C**.

(3)

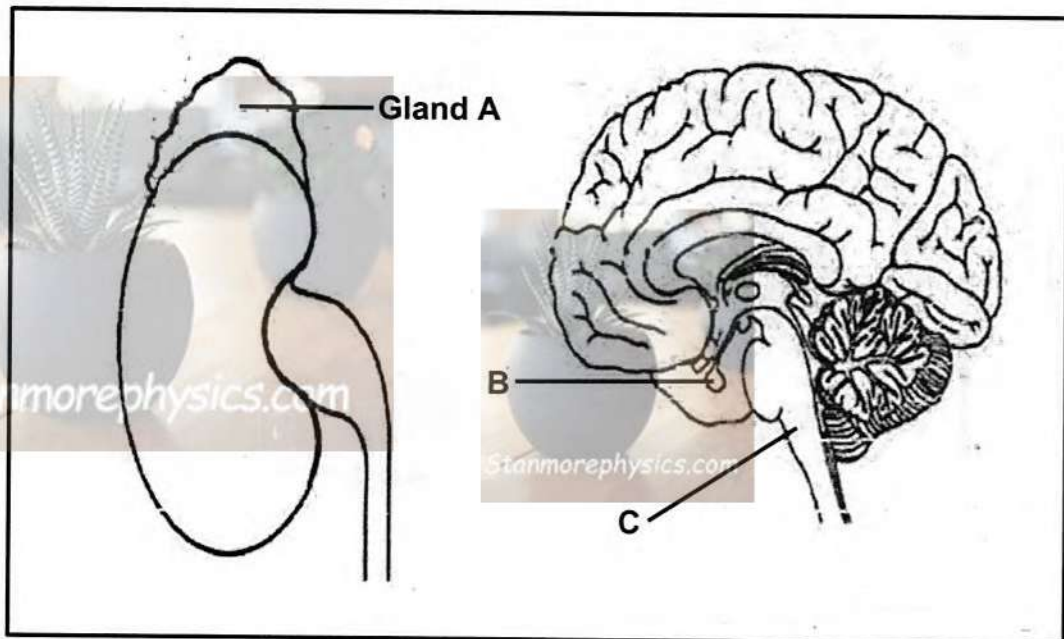
(9)

2.5		The diagram below represents a human ear.	
			
2.5.1		Identify part:	
		(a) A	(1)
		(b) E	(1)
2.5.2		Write down the LETTER of the part that releases pressure from the inner ear.	(1)
2.5.3		Explain what would happen if structure B had a hole in it.	(2)
2.5.4		Explain the effect if the receptors in region D are damaged.	(3)
2.5.5		Describe how the parts of the middle ear, including the membranes, assist in amplifying sounds.	(3)
			(11)
		TOTAL QUESTION 2:	50

QUESTION 3

3.1

The diagrams below show the human kidney and human brain.



3.1.1 Identify gland:

(a) **A**

(1)

(b) **B**

(1)

3.1.2 Name the hormone released by gland **B** that has an effect on:

(a) The renal tubules

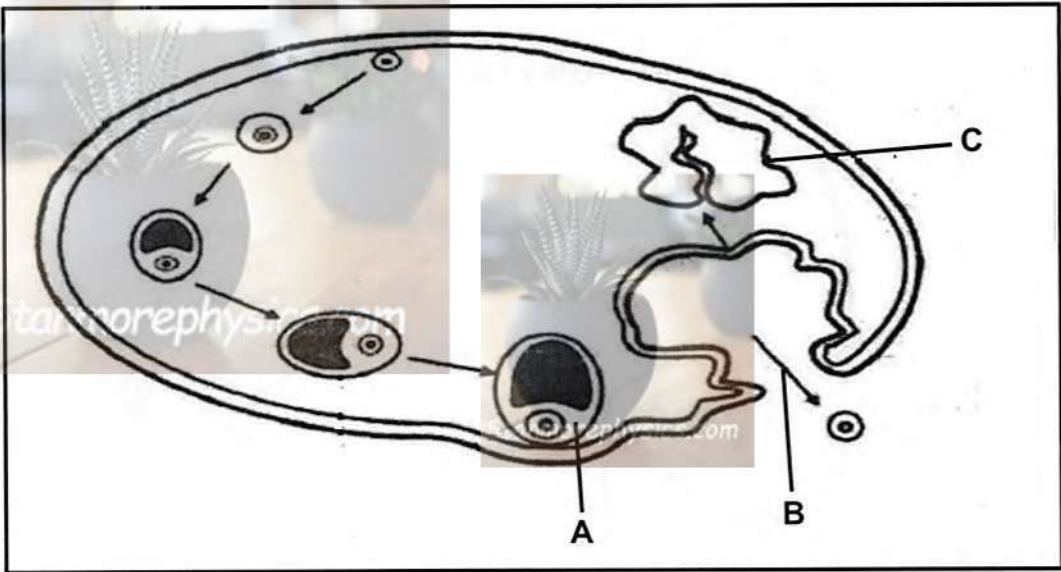
(1)

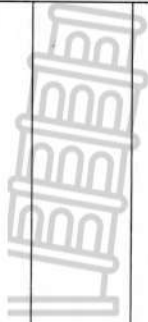
(b) Mammary glands of a pregnant female

(1)

3.1.3 During an emergency situation, gland **A** secretes a hormone that prepares the body for a 'fight or flight' response. This response leads to an increased energy production in the skeletal muscles and an increase in the blood carbon dioxide levels.(a) Name the hormone secreted by gland **A**.

(1)

	(b) Explain the effects of the hormone mentioned in QUESTION 3.1.3 (a) on the blood vessels of the skeletal muscles.	(4)
	(c) Describe how part C regulates the increased carbon dioxide levels in blood.	(5)
		(14)
3.2	The diagram below represents the events that take place during the ovarian cycle of a human. 	
3.2.1	Give the name of the:	
	(a) Process that takes place at B .	(1)
	(b) Hormone that causes the process in QUESTION 3.2.1(a) to occur.	(1)
3.2.2	Describe the changes that take place in the uterus as a result of the hormone secreted by structure A .	(2)
3.2.3	If fertilisation takes place, structure C does not degenerate.	
	Explain the implication of this for the:	
	(a) Uterine cycle	(3)
	(b) Ovarian cycle	(3)
		(10)



3.3

The table below shows the recorded number of severe brain injuries per 100 000 people per year in different regions of the world.

Regions of the world	Number of severe brain injuries (per 100 000 thousand people per year)
Latin America	900
USA and Canada	1300
East Mediterranean	890
Europe	1010
Africa	800

3.3.1 Calculate the average number of brain injuries in the different regions. Show ALL working.

(2)

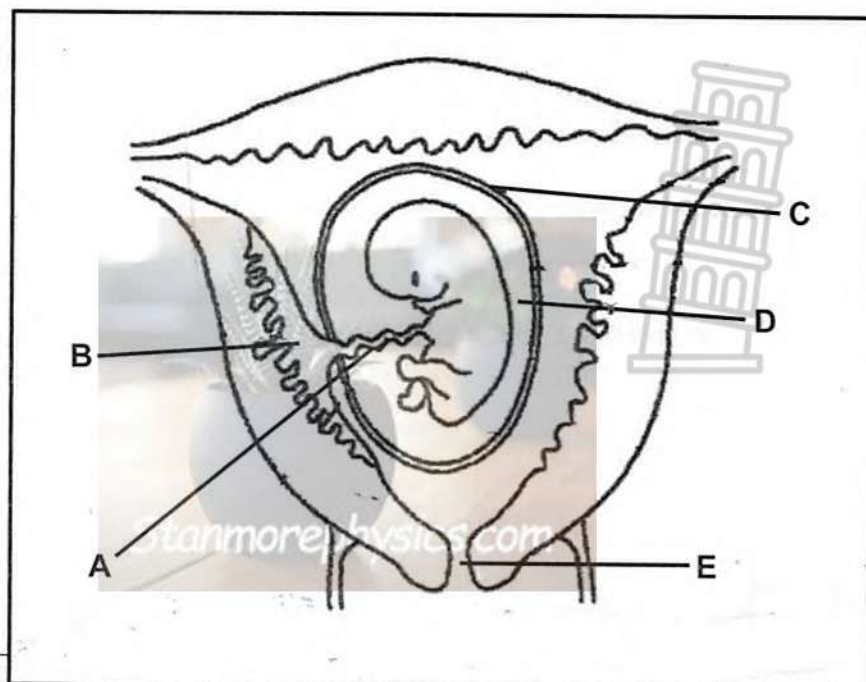
3.3.2 Draw a bar graph to represent the data in the table.

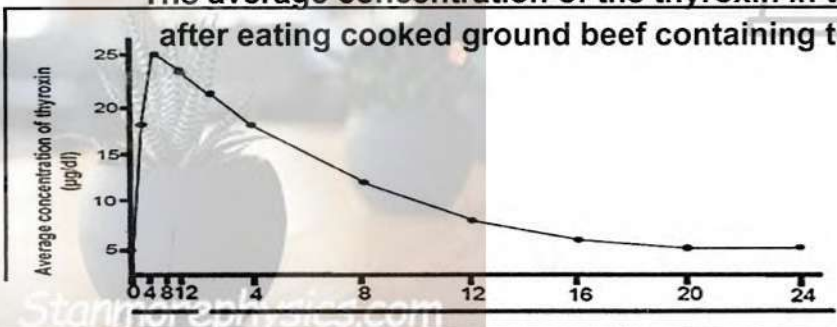
(6)

(8)

3.4

The diagram below represents a developing foetus in the uterus of a human female.



3.4.1	Identify part:																	
	(a) A	(1)																
	(b) E	(1)																
3.4.2	Name the blood vessel found in part A that transports carbon dioxide from the foetus to the mother.	(1)																
3.4.3	State TWO functions of the fluid found in part D .	(2)																
3.4.4	Explain one negative impact on foetal development if part B is reduced significantly.	(2)																
		(7)																
3.5	Read the extract below. AN OUTBREAK OF THYROTOXICOSIS Thyrotoxicosis is a medical condition caused by high levels of thyroxin in the blood. There was a sudden increase in the number of reported cases of the condition in one city. They suspected that this was due to people eating ground beef (minced meat) from a local butcher. The butcher added the thyroid glands of cattle when he produced the ground beef. Some people who ate this ground beef showed symptoms of increased heart rate, excessive sweating and weight loss. Doctors conducted an investigation to determine if the ground beef caused the thyrotoxicosis. The normal thyroxin levels of 5 volunteers were measured. They were then given cooked ground beef from the butchery to eat. Their thyroxin concentration was measured every 4 hours on day 1 and then once a day for the next 23 days. The average thyroxin levels was calculated and recorded. The results are shown in the graph below. The average concentration of the thyroxin in the volunteers after eating cooked ground beef containing thyroid gland  <table border="1" style="display: none;"><caption>Data points from the graph</caption><thead><tr><th>Time</th><th>Average concentration of thyroxin (µg/dl)</th></tr></thead><tbody><tr><td>0</td><td>~18</td></tr><tr><td>4</td><td>~25</td></tr><tr><td>8</td><td>~18</td></tr><tr><td>12</td><td>~12</td></tr><tr><td>16</td><td>~8</td></tr><tr><td>20</td><td>~6</td></tr><tr><td>24</td><td>~5</td></tr></tbody></table>		Time	Average concentration of thyroxin (µg/dl)	0	~18	4	~25	8	~18	12	~12	16	~8	20	~6	24	~5
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0	~18																	
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8	~18																	
12	~12																	
16	~8																	
20	~6																	
24	~5																	

	3.5.1	Name the type of interaction that results between TSH and the thyroid gland.	(1)
	3.5.2	Calculate the percentage increase of the average thyroxin concentration in the first 8 hours after eating the ground beef. Show ALL working	(3)
	3.5.3	Explain why thyrotoxicosis causes weight loss.	(3)
	3.5.4	Explain the expected concentration of TSH in the blood 8 hours after eating the ground beef.	(4)
			(11)
		TOTAL QUESTION 3:	50
		TOTAL SECTION B:	100
		GRAND TOTAL:	150



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**NATIONAL
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GRADE 12

LIFE SCIENCES P1

SEPTEMBER

2026

MARKING GUIDELINES

MARKS: 150

This MARKING GUIDELINES consists of 11 pages

PRINCIPLES RELATED TO MARKING LIFE SCIENCES

1. **If more information than marks allocated is given**
Stop marking when maximum marks is reached and put a wavy line and 'max' in the right hand margin.
2. **If, for example, three reasons are required and five are given**
Mark the first three irrespective of whether all or some are correct/incorrect.
3. **If 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 becomes correct again, resume credit.
9. **Non-recognized abbreviations**
Accept if first defined in answer. If not defined, do not credit the unrecognised abbreviation but credit the rest of answer if correct.
10. **Wrong numbering**
If answer fits into the correct sequence of questions but the wrong number is given, it is acceptable.
11. **If language used changes the intended meaning**
Do not accept.
12. **Spelling errors**
If recognizable, accept, provided it does not mean something else in Life Sciences or if it is out of context.
13. **If common names given in terminology**
Accept, provided it was accepted at the National memo discussion meeting.
14. **If only letter is asked for and only name is given (and vice versa)**
No credit.

15. **If units are not given in measurements**

Memorandum will allocate marks for units separately, except where it is already given in the question.

16. Be sensitive to the **sense of an answer, which may be stated in a different way.**

17. **Caption**

Credit will be given for captions to all illustrations (diagrams, graphs, tables, etc.) except where it is already given in the question.

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.



SECTION A			
QUESTION 1			
1.1			
1.1.1	D✓✓		
1.1.2	C✓✓		
1.1.3	B✓✓		
1.1.4	A✓✓		
1.1.5	B✓✓		
1.1.6	C✓✓		
1.1.7	C✓✓		
1.1.8	B✓✓		
1.1.9	B✓✓		
		(9 x 2)	(18)
1.2			
1.2.1	Blastula✓/blastocyst		
1.2.2	Sclera✓		
1.2.3	Thermoregulation✓		
1.2.4	Puberty✓		
1.2.5	Parasympathetic nervous system✓.		
1.2.6	Mitosis✓		
1.2.7	Absciscic Acid✓		
1.2.8	Meninges✓		
1.2.9	Geotropism✓/Gravitropism		
1.2.10	Binocular✓/Stereoscopic vision		
		(10 x1)	(10)

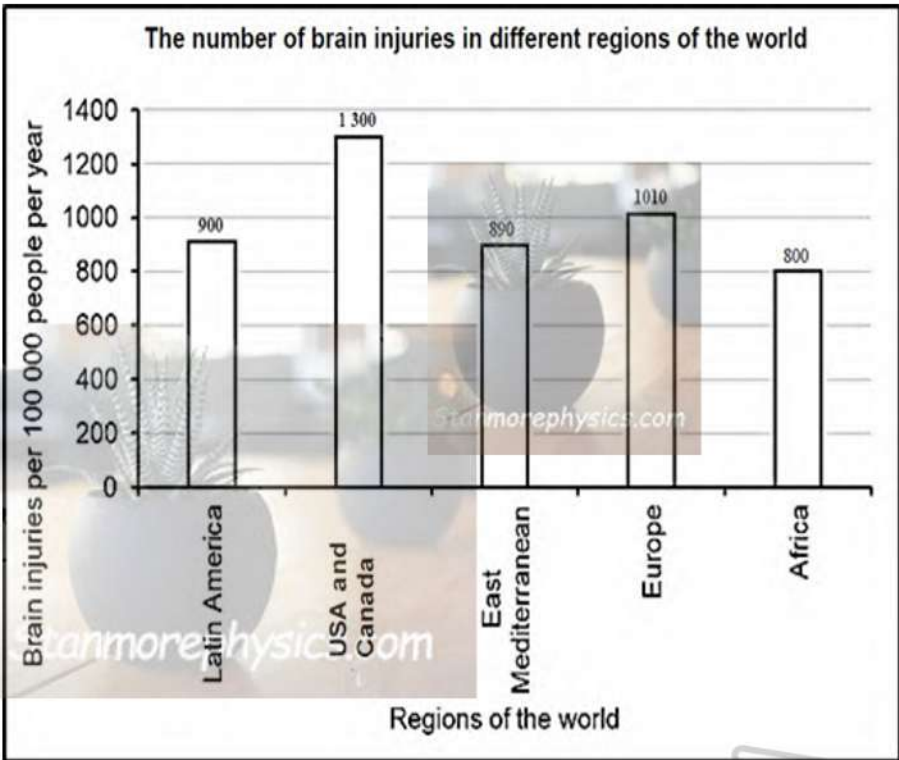
1.3			
1.3.1	B only✓✓		
1.3.2	None✓✓		
1.3.3	B only✓✓		
		(3 x 2)	(6)
1.4			
1.4.1	(a) Vas deferens✓/sperm duct		(1)
	(b) Urethra✓		(1)
	(c) Fallopian tube✓/oviduct		(1)
1.4.2	E✓		(1)
1.4.3	(a) C✓ - Prostate gland✓		(2)
	(b) H✓ - vagina✓		(2)
1.4.4	Oogenesis✓		(1)
1.4.5	46✓		(1)
			(11)
1.5			
1.5.1	(a) Amniotic egg ✓		(1)
	(b) Internal✓fertilisation		(1)
1.5.2	Down feathers✓		(1)
1.5.3	Altricial✓		(1)
1.5.4	Allantois✓		(1)
1.5.4	B✓		(1)
			(6)
		TOTAL SECTION A:	50

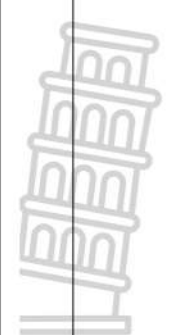
SECTION B			
QUESTION 2			
2.1			
2.1.1	(a) Radial muscle✓		(1)
	(b) Circular muscle✓		(1)
	(c) Ciliary body✓ /ciliary muscles		(1)
2.1.2	(a) B✓		(1)
	(b) C✓		(1)
2.1.3	- Accommodation*✓ for distant vision - Ciliary muscles relax✓ - Suspensory ligaments become taut✓ /tension on the lens increases - Lens become less convex✓ /flat - Light rays are refracted less✓ - Light rays are focused onto the retina✓	1* Compulsory mark + 5 Stanmorephysics.com	(6)
			(11)
2.2			
2.2.1	A rapid, involuntary response✓ to a stimulus✓		(2)
2.2.2	- From the dendrite✓ - to the axon✓ OR - From the cell body✓ to the axon✓	Any	(2)
2.2.3	0 to 1✓µm / accept 0 to 0,9 µm		(1)
2.2.4	As the axon diameter increases the speed of the impulse increases ✓✓ OR As the axon diameter decreases the speed of the impulse decreases ✓✓		(2)
2.2.5	- The speed of the impulse will decrease✓ - resulting in it taking longer for impulses to reach the effectors✓ - and the person will react slowly✓		(3)
			(10)

2.3			
2.3.1	Male fertility✓		(1)
2.3.2	Measuring the sperm count✓/total number of healthy sperms		(1)
2.3.3	- Age✓ - Diet✓ - Exercise✓ - Lifestyle ✓ - Activity level✓ - Occupation✓ Mark first TWO only		(2)
2.3.4	- The higher temperature/pressure on the testes✓ due to the tight underwear - could decrease the sperm count✓/sperm production/lead to production of abnormal sperms/unhealthy sperms/poor quantity and quality of sperms		(2)
2.3.5	- TU inhibits the secretion of testosterone✓ - spermatogenesis cannot take place✓/ no sperm will be produced		(2)
2.3.6	- To determine if TU is still effective after 12 months✓ - To see if the sperm count returns to normal✓ when the treatment stops Mark first ONE only		(1)
			(9)
2.4			
2.4.1	Auxins✓		(1)
2.4.2	- Auxins diffuse through the agar to the stem✓ - auxins are sensitive to light✓/are destroyed by light/move away from light - There is a higher concentration of auxins on the darker side of the stem✓ - stem grows faster ✓ /shows more cell elongation on the darker side - causing the stem to grow/bend towards light✓		(5)
2.4.3	- Light will not reach the tip of the stem✓ - Auxins are distributed evenly throughout the stem✓ - The stem will grow straight upwards✓		(3)
			(9)

2.5			
2.5.1	(a) Eustachian tube ✓		(1)
	(b) Auditory nerve ✓		(1)
2.5.2	F✓		(1)
2.5.3	- Tympanic membrane will not be able to vibrate ✓ to - transmit vibrations to the middle ear/ossicles ✓ and this - may cause hearing loss ✓ /deafness Any		(2)
2.5.4	- The receptors cannot convert the stimuli into impulses ✓ - No impulses/fewer impulses are transmitted to the cerebrum ✓ - and the person does not hear anything ✓ /hearing is impaired/no interpretation happens		(3)
2.5.5	- The sound vibrations are transmitted from the large tympanic membrane ✓ - to the smaller oval window ✓ - through the ossicles ✓ - which are arranged from largest to smallest ✓ - This concentrates the vibrations ✓, amplifying them Any		(3)
			(11)
		TOTAL QUESTION 2:	50

QUESTION 3			
3.1			
3.1.1	(a) Adrenal✓gland		(1)
	(b) Pituitary gland✓/Hypophysis		(1)
3.1.2	(a) ADH✓		
	(b) prolactin✓		(1)
3.1.3			
	(a) Adrenalin✓		(1)
	(b) - adrenalin causes blood vessels to dilate✓since - muscles require more blood✓/with more oxygen and glucose - for increased cellular respiration✓/increased breakdown of glucose - to supply additional energy✓		(4)
	(c) - Part C/the medulla oblongata is stimulated✓and - send impulses to the heart✓ - the heart beat faster✓ - impulses are also sent to the breathing muscles✓/ diaphragm and intercostal muscles - the rate and depth of breathing increases✓ - More carbon dioxide is taken to the lungs✓/ exhaled - the carbon dioxide levels return to normal✓		(1)
	Any		(5)
			(14)
3.2			
3.2.1	(a) Ovulation✓		(1)
	(b) LH ✓/(Luteinising Hormone)		(1)
3.2.2	- It causes the endometrium✓ - to become thicker✓/more glandular/more vascular		(2)
3.2.3	(a) - The levels of progesterone remain high✓ - the endometrium is maintained✓ - the endometrial lining is not shed✓/no menstruation takes place		(3)

	(b)													
	- The levels of progesterone remain high✓ - FSH secretion is inhibited✓ - no new follicle develops✓/no ovum is produced	(3)												
		(10)												
3.3														
3.3.1	$\frac{4900}{5} \checkmark \quad (900+1300+890+1010+800)$ $= 980 \checkmark$	(2)												
3.3.2	The number of brain injuries in different regions of the world <table><thead><tr><th>Regions of the world</th><th>Brain injuries per 100 000 people per year</th></tr></thead><tbody><tr><td>Latin America</td><td>900</td></tr><tr><td>USA and Canada</td><td>1300</td></tr><tr><td>East Mediterranean</td><td>890</td></tr><tr><td>Europe</td><td>1010</td></tr><tr><td>Africa</td><td>800</td></tr></tbody></table>	Regions of the world	Brain injuries per 100 000 people per year	Latin America	900	USA and Canada	1300	East Mediterranean	890	Europe	1010	Africa	800	
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	Rubric/criteria for marking graph:														
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		(8)													
3.4															
3.4.1	(a) Umbilical cord✓	(1)													
	(b) Cervix✓/cervical opening	(1)													
3.4.2	Umbilical artery✓	(1)													
3.4.3	- Protects the foetus from shock✓/Acts as a shock absorber - Protects the foetus from drying out✓ - Protects the foetus from temperature changes✓ - Allows free foetal movement✓ Mark first TWO only	(2)													
3.4.4	- The foetus will receive less nutrients✓ and therefore have a lower birth mass✓/physical under-development/mental under- development -The foetus will receive less oxygen And therefore have a lower birth mass/✓physical under-development/mental under- development -Waste will accumulate✓ And it will affect the functioning of the foetus✓/poisons foetus Mark first ONE only	(2)													
		(7)													

3.5			
3.5.1	Negative feedback mechanism✓		(1)
3.5.2	$\frac{(25 - 5)}{5} \times 100$ $= 400\%$ OR $\frac{(24 - 5)}{5} \times 100$ $= 380\%$		(3)
3.5.3	- Thyrotoxicosis increases the metabolic rate✓/rate of cellular metabolism ✓ - more glucose is used✓ - less glucose is stored✓ - fat is broken down✓ causing weight loss	Any	(3)
3.5.4	- The high levels of thyroxin✓ in the blood - causes the pituitary gland✓/Hypophysis - to secrete less TSH✓ into the blood - Causing the levels of TSH to decrease✓		(4)
			(11)
		TOTAL QUESTION 3:	50
		TOTAL SECTION B:	100
		GRAND TOTAL:	150

