Downloaded from Stanmorephysics.com

GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PREPARATORY EXAMINATION

2025

10831

LIFE SCIENCES

(PAPER 1)

TIME: 2½ hours

MARKS: 150

LIFE SCIENCES: Paper 1

10831E

20 pages

X05

Downloaded from Stanmorephysics.com

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions in the ANSWER BOOK.
2. Start the answers to EACH question at the top of 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. Do ALL drawings 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 must use a non-programmable calculator, protractor and 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 answer and write only the letter (A – D) next to the question numbers (1.1.1 to 1.1.8) in the ANSWER BOOK, e.g. 1.1.9 E.

1.1.1 Which of the following is a mechanical defence mechanism that plants use?

A Production of sweet nectar in flowers
B Secretion of chemicals to make leaves taste better to herbivores
C Thorns on stems and leaves
D Increased secretion of abscisic acid causes leaves and fruit to fall off the plant

1.1.2 The following statements describe some parts of a human sperm cell.

(i) Many mitochondria that provide energy for movement
(ii) A tail that moves in a whip-like motion
(iii) Acrosome that contains enzymes to digest the jelly layer of the ovum
(iv) The nucleus contains 23 chromosomes

Which combination of statements are structural adaptations that ensure that sperm cells can move towards an ovum?

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

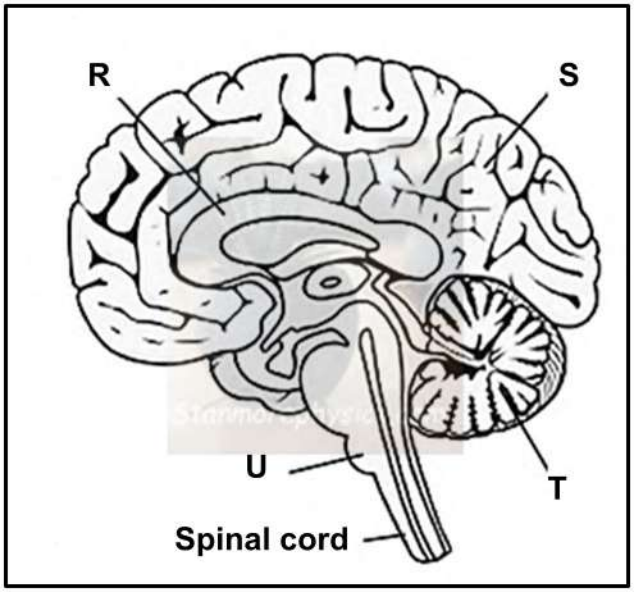
1.1.3 Which of the following events takes place during oogenesis?

A Three daughter cells from meiosis will degenerate.
B The diploid germinal epithelial cells lining the seminiferous tubules go through meiosis.
C Four daughter cells survive to form mature ova.
D One daughter cell will mature into a sperm cell.

Downloaded from Stanmorephysics.com

QUESTIONS 1.1.4 AND 1.1.5 ARE BASED ON THE FOLLOWING DIAGRAM.

The diagram below shows the internal structure of the human brain.



[Source: *https://www.shutterstock.com/search/labeled-brain-anatomy*]

1.1.4 Which of the following is NOT a function of part **S**?

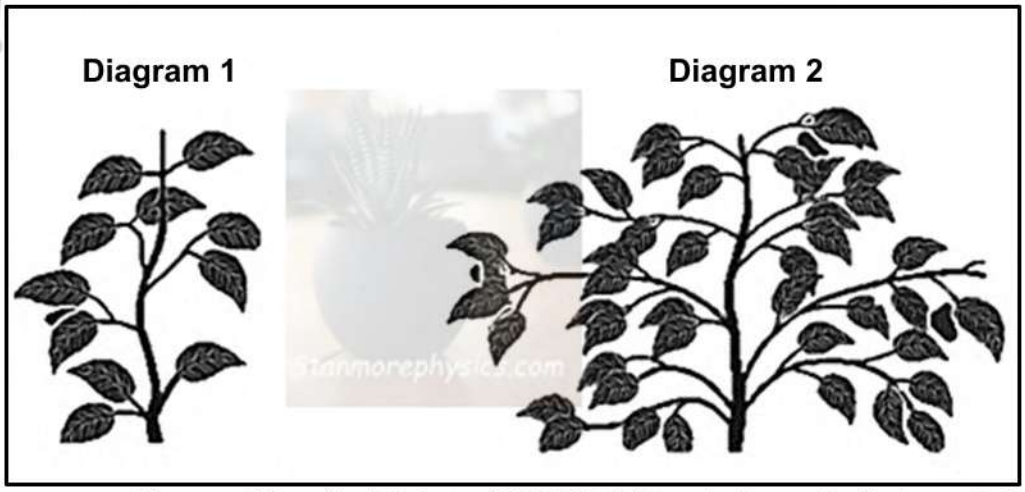
A Controls voluntary muscular movements
B Regulates heartbeat
C Interprets sensory impulses
D Controls higher thought processes

1.1.5 Which label indicates the corpus callosum?

A Part **R**
B Part **S**
C Part **T**
D Part **U**

Downloaded from Stanmorephysics.com

1.1.6 A person has a tree in his garden, as shown in **Diagram 1**. He wants the tree to grow to look like the neighbour's tree, as shown in **Diagram 2**.



[Source: *https://quizlet.com/280394463/93-apical-growth-flash-cards/*]

How should the tree in Diagram **1** be treated to achieve his goal?

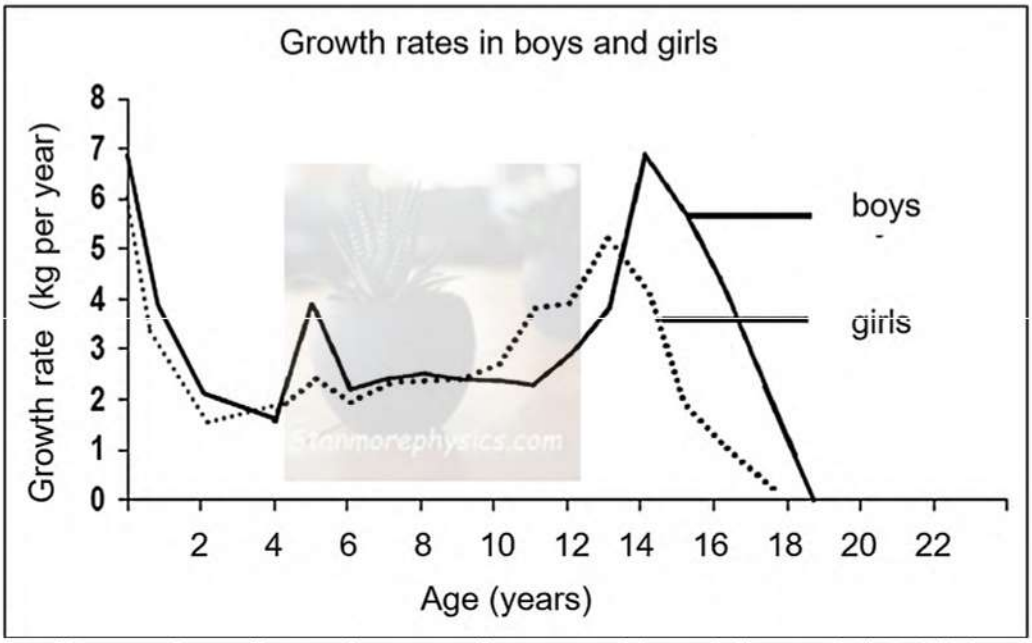
A Treat the plant with auxins to elongate the cells.
B Provide the stem with unilateral light.
C Add abscisic acid to the soil to promote growth.
D Cut the main stem to remove apical dominance.

1.1.7 A person begins to climb to the top of Mount Everest. Which of the following changes will most likely occur in the person's body as they start to climb?

A Oxygen in the blood increases, causing the rate and depth of breathing to decrease.
B Carbon dioxide in the blood increases, causing the rate and depth of breathing to increase.
C Oxygen in the blood decreases, causing the rate and depth of breathing to decrease.
D Carbon dioxide in the blood decreases, causing the rate and depth of breathing to increase.

Downloaded from Stanmorephysics.com

1.1.8 The graph below shows the growth rates in boys and girls from birth until their late teens.



[Source: *https://www.glowm.com/resources/glowm/cd/pages/v5/v5c016.html*]

Which of the following statements is a correct conclusion from the graphs?

A Boys always have a higher growth rate than girls.
B Boys stop growing at a younger age than girls.
C Girls have a higher growth rate than boys between the ages of 4 and 6 years.
D Girls have a higher growth rate than boys between the ages of 10 and 13 years.

(8 x 2) **(16)**

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 A chemical substance that causes communication between the end of one neuron and the start of the next neuron

1.2.2 The hormone that stimulates the production of milk in human females

1.2.3 A bony structure that encloses and protects the brain

1.2.4 Fluid that protects the human embryo against mechanical injuries

1.2.5 A phenomenon where an increase in the secretion of one hormone inhibits the secretion of another hormone

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

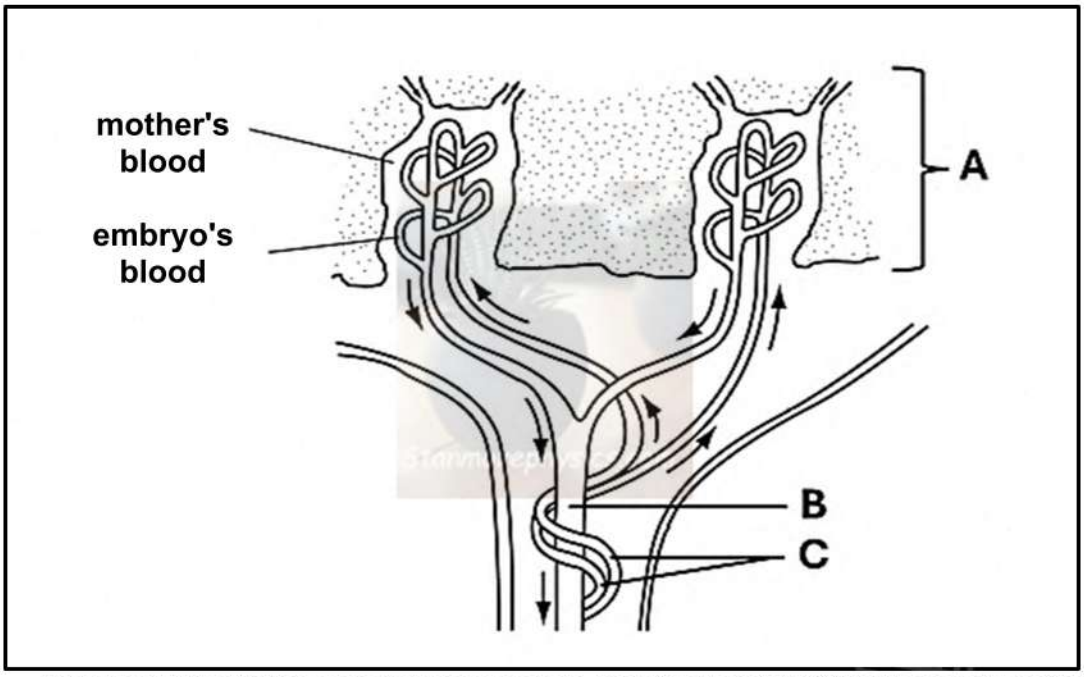
Downloaded from Stanmorephysics.com

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	The site where fertilisation takes place	A B	Fallopian tube Uterus
1.3.2	A condition, which results in the lens becoming cloudy	A B	Astigmatism Cataracts
1.3.3	Pupillary mechanism response when the stimulus is a bright light	A B	Ciliary muscle contracts Radial muscles contract

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

1.4 The diagram below shows how the blood of a human embryo flows close to the mother's blood during pregnancy.



[Source: *https://www.savemyexams.com/o-level/biology/cie/23/topic-questions/16-development-of-organisms-and-continuity-of-life/16-4-sexual-reproduction-in-humans/multiple-choice-questions/*]

1.4.1 Give the name of the structure that contains vessel **B** and vessel **C**. (1)

1.4.2 List TWO important substances that are transported by vessel **B**. (2)

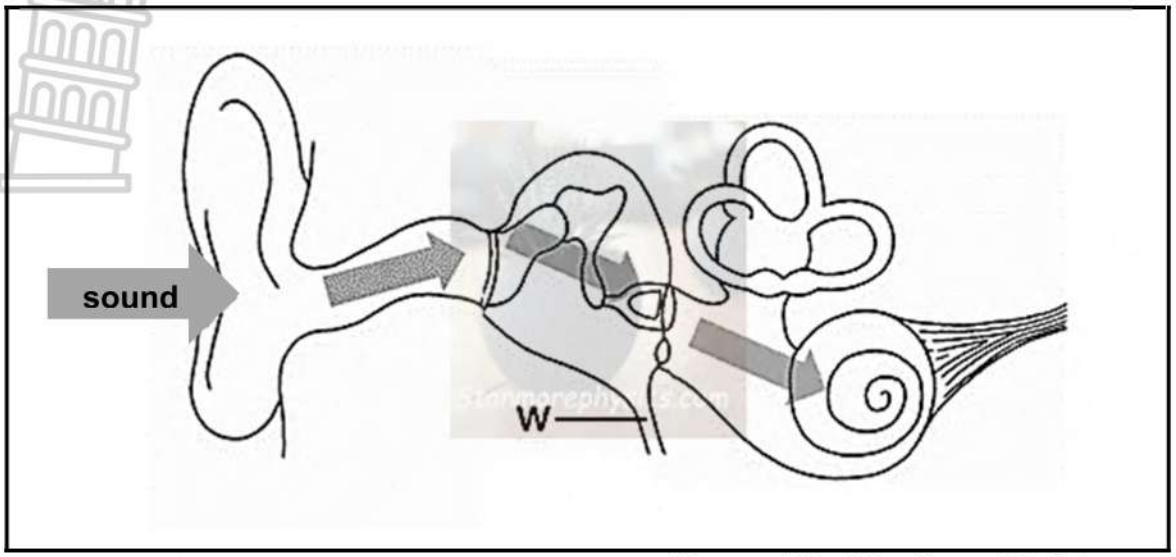
1.4.3 One of the functions of part **A** is to bring the mother's and embryo's blood close together.

(a) Identify part **A**. (1)

(b) Name the process by which substances move down a concentration gradient from the mother's blood to the embryo's blood. (1)
(5)

Downloaded from Stanmorephysics.com

1.5 One of the main functions of the human ear is hearing.



[Source: Mind The Gap – Life Sciences]

1.5.1 Give the name of the part of the ear that performs each of the following functions:

(a) Directs soundwaves to the auditory canal (1)

(b) Converts sound stimulus into nerve impulses (1)

(c) Transmits vibrations from the tympanic membrane to the oval window (1)

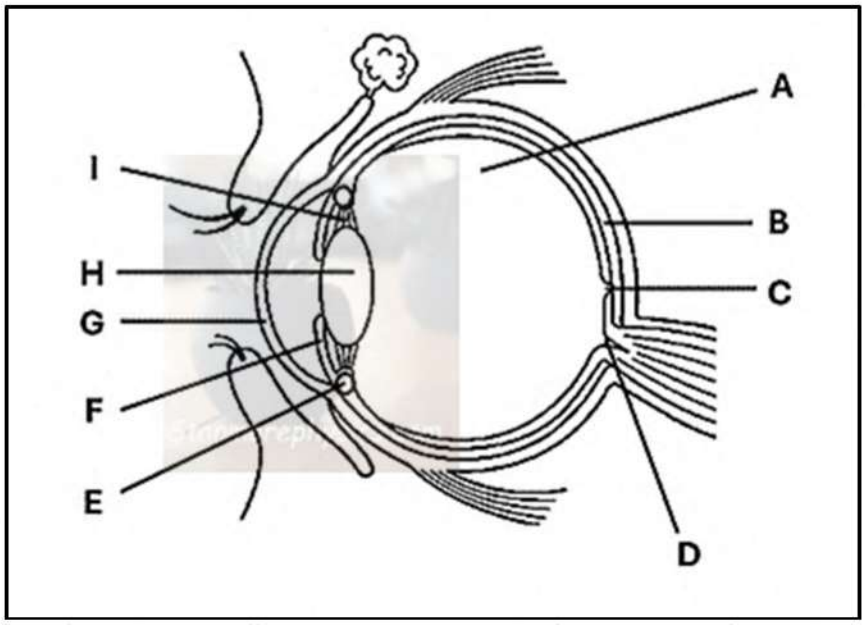
1.5.2 A middle ear infection can result in the production of excess fluid.
If part **W** becomes blocked, the fluid cannot drain naturally and a build-up of fluid causes an increase in pressure in the middle ear which may interfere with hearing.

(a) Identify part **W**. (1)

(b) Give the name of the small tube that is surgically inserted into the tympanic membrane to drain the excess fluid and reduce pressure in the middle ear. (1)
(5)

Downloaded from Stanmorephysics.com

1.6 The diagram below represents the internal structure of the human eye.



[Source: *https://www.shutterstock.com/image-vector/structural-diagram-eye-no-text-line-2289561893*]

1.6.1 Give the LETTER and NAME of the part that:

(a) Contains the highest concentration of cones (2)

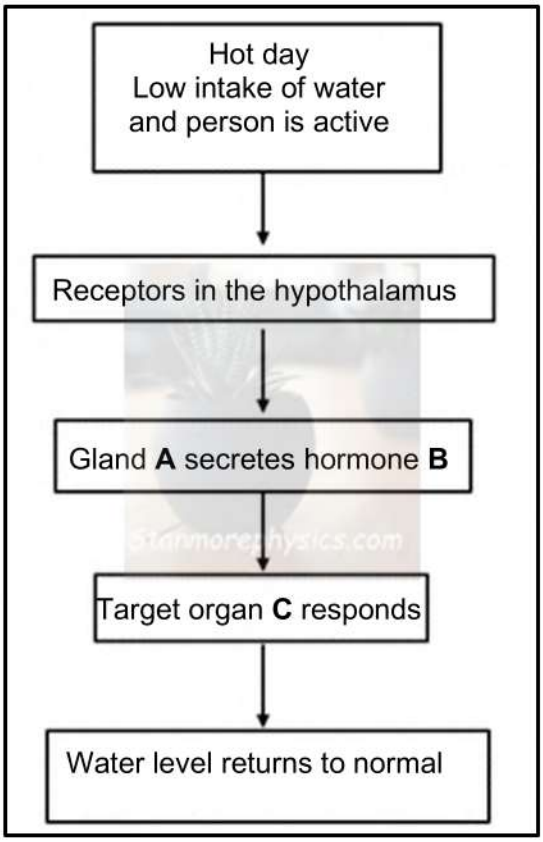
(b) Is a transparent layer at the front of the eye that causes the refraction of light (2)

(c) Prevents the reflection of light in the eye (2)

1.6.2 Give the LETTER(S) of the part(s) that will cause a change in the shape of part **H** during accommodation. (2)
(8)

Downloaded from Stanmorephysics.com

1.7 The flow diagram below shows the process of homeostasis in a human body on a hot day to balance the internal water level.



1.7.1 Name the homeostatic process represented by the flow diagram above. (1)

1.7.2 Give the name of:

(a) Gland **A** (1)

(b) Hormone **B** (1)

(c) Target organ **C** (1)

1.7.3 Will the urine produced on a hot day be DILUTED or CONCENTRATED? (1)
(5)

TOTAL SECTION A: 50

Downloaded from Stanmorephysics.com

SECTION B

QUESTION 2

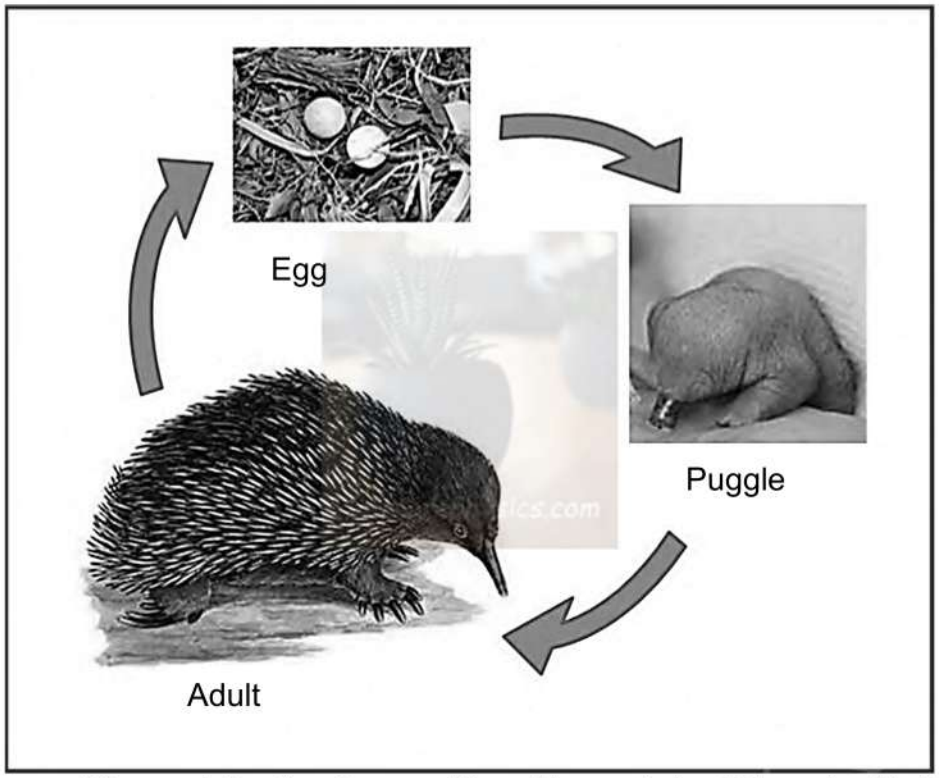
2.1

Echidnas are mammals that reproduce using internal fertilisation.

An adult female echidna usually lays a single, leathery egg once a year. She rolls the newly laid egg, into a deep pocket, or pouch, on her stomach to keep it safe. Ten days later the baby echidna, called a puggle, hatches.

At birth the puggle does not have spines sticking out from its skin. The puggle laps up milk that the mother's body secretes from special glands in her pouch. It remains in the pouch until its spines begin to break through its skin, at about 53 days. Then the mother puts the puggle into a burrow, where she returns to feed it every 5 to 10 days until it is old enough to go out on its own, at about 7 months old.

[Adapted from *https://animals.sandiegozoo.org/animals/echidna*]



[Source: *https://cpsteamwork6.weebly.com/animal-life-cycles.html*]

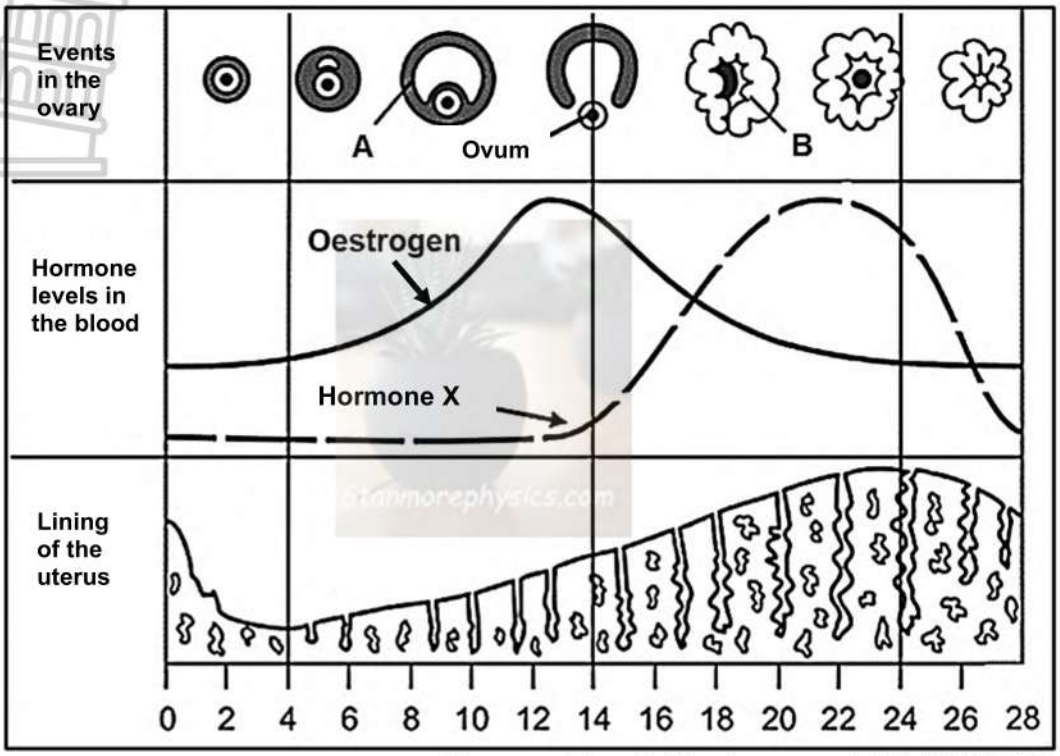
2.1.1 Describe *internal fertilisation*. (2)

2.1.2 Using the information above, give TWO reasons that would support the conclusion that echidnas are altricial at birth. (2)

2.1.3 Different species of mammals have different strategies for embryonic development. Tabulate TWO differences between the embryonic development strategies of *vivipary* and *ovipary*. (5)
(9)

Downloaded from Stanmorephysics.com

2.2 The diagram below represents parts of the menstrual cycle.



[Source: *https://slideplayer.com/slide/14462286/ Human reproduction slide 10 And https://quizlet.com/209572122/june-2014-part-b-flash-cards/*]

2.2.1 Using the diagram above, identify:

(a) Part **A** (1)

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

2.2.2 (a) According to the diagram above, on which day did ovulation take place? (1)

(b) Give ONE visible reason for your answer to QUESTION 2.2.2 (a). (1)

2.2.3 (a) Identify hormone **X**. (1)

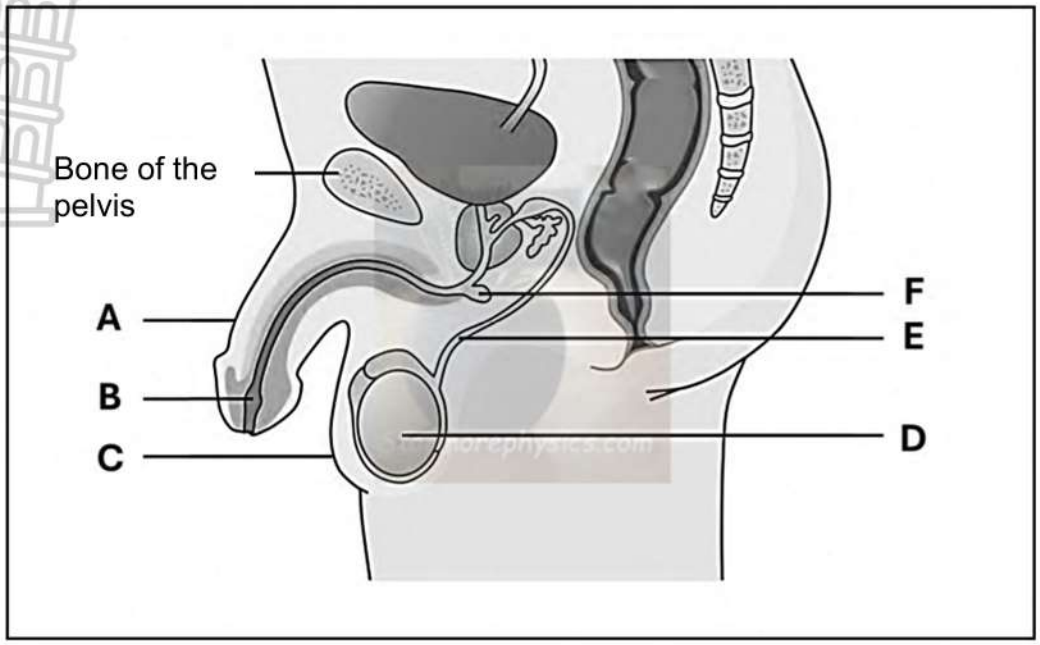
(b) Explain the influence of hormone **X** on the uterus between day 14 and day 24. (2)

2.2.4 According to the diagram above, for how long did menstruation last? (1)

2.2.5 Describe the role of FSH in the menstrual cycle. (3)
(11)

Downloaded from Stanmorephysics.com

2.3 The diagram below shows a side view of the male reproductive system.



[Source: *https://www.healthdirect.gov.au/male-reproductive-system*]

2.3.1 Identify the parts labelled:

(a) **B** (1)

(b) **F** (1)

2.3.2 Give the name of the part that:

(a) Transports sperm away from the epididymis to the accessory glands (1)

(b) Is used to deposit sperm into the female during copulation (1)

2.3.3 Name TWO secretions from the accessory glands and describe how each secretion can improve sperm maturation and motility. (4)
(8)

Downloaded from Stanmorephysics.com

2.4 In 2018, a teaching hospital in India carried out a survey to determine the incidence of cancer in different parts of the female reproductive system. They carried out research by interviewing patients and studying patient records. The results are shown in the table below.

Part of the female reproductive system	Incidence of cancer (%)
Cervix	56,94
Endometrium	22,50
Ovary	15,56
Vagina	3,33
Vulva	1,67

[Adapted from *https://www.researchgate.net/publication/329215773_Prevalence_of_female_reproductive_tract_cancer_in_a_teaching_hospital_of_Rohtas_District_Bihar_India*]

2.4.1 Where is the cervix located in the female reproductive system? (1)

2.4.2 State TWO planning steps that would have been taken before the start of this survey. (2)

2.4.3 Draw a pie chart to represent the data in the table. (6)
(9)

2.5 Myopia is referred to as short-sightedness and is a common cause of visual disability worldwide. The World Health Organisation has grouped the following conditions among the leading causes of blindness and vision impairment in the world:

- myopia
- uncorrected refractive error with cataract
- macular degeneration
- infectious disease
- vitamin A deficiency

[Adapted from *https://pmc.ncbi.nlm.nih.gov/articles/PMC1123161/*]

2.5.1 According to the text above, name TWO of the leading causes of blindness and vision impairment worldwide other than short-sightedness. (2)

2.5.2 Explain why a blurred image will be formed on the retina of a short-sighted person. (2)

2.5.3 (a) Describe the type of lens that will be used to correct short-sightedness. (1)

(b) Explain how the lens in QUESTION 2.5.3 (a) will correct short-sightedness. (2)
(7)

Downloaded from Stanmorephysics.com

2.6 A pirouette is a ballet move where a dancer spins or rotates on one foot. During a pirouette, the dancer's head remains still, and the body turns.

[Source: *https://rachelhuntanimations.blogspot.com/2012/10/random-character.html*]

Describe how the dancer maintains her balance throughout the pirouette. (6)

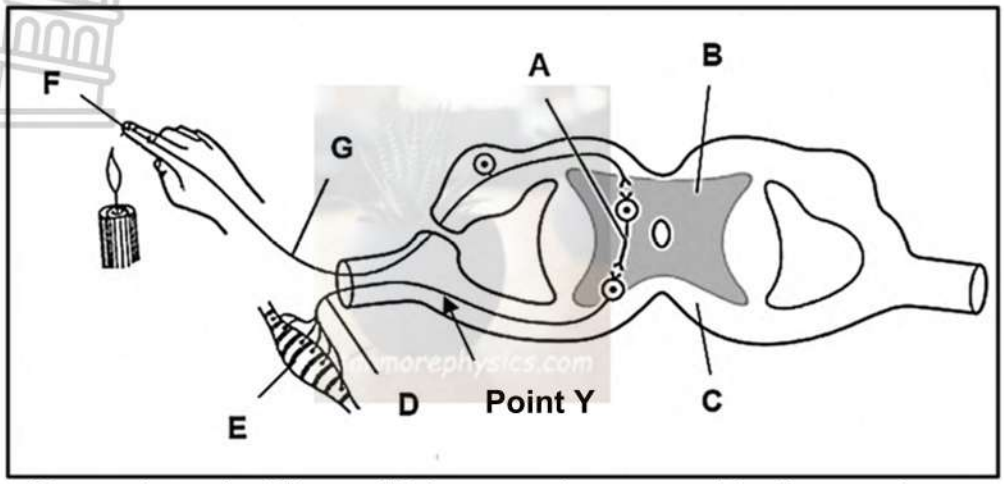
(6)

[50]

Downloaded from Stanmorephysics.com

QUESTION 3

3.1 The diagram below shows a reflex arc.



[Source: https://askfilo.com/biology-question-answers/the-diagram-shows-a-simple-reflex-arc-which-labelled-part-is-the-sensory-neurone]

3.1.1 To which part of the nervous system does the spinal cord belong? (1)

3.1.2 Define the term *synapse*. (2)

3.1.3 Give the name of the type of neuron that forms:

(a) Grey matter in the spinal cord (1)

(b) The dorsal root of the spinal nerve (1)

3.1.4 Describe the difference between a *reflex arc* and a *reflex action*. (2)

3.1.5 Write the letters for parts **A**, **D** and **G** in the correct order to indicate the direction in which an impulse will travel. (2)

3.1.6 Describe how the flame would affect the person if part **D** was damaged at point **Y.** (3)

3.1.7 Draw a labelled diagram of a sensory neuron. (5)
(17)

Downloaded from Stanmorephysics.com

3.2 A study was conducted to investigate the effects of environmental temperature on human core body temperature. The researchers exposed 26 male participants, between the ages of 20 – 25 years, to varying environmental temperatures (10°C, 20°C, 30°C, and 40°C) while monitoring their core body temperatures every 15 minutes for an hour at each environmental temperature. The table below represents the average results collected after conducting the investigation three times.

Environmental temperature (°C)	Average Core Body Temperatures (°C)
10	36,5
20	36,8
30	36,6
40	36,7

3.2.1 Name the process by which humans can maintain a constant internal body temperature. (1)

3.2.2 Identify the following in the investigation:

(a) The independent variable (1)

(b) The dependent variable (1)

3.2.3 Explain the importance of conducting the investigation on male participants only. (2)

3.2.4 Describe TWO ways in which the researchers ensured the reliability of the results. (2)

3.2.5 Describe TWO ways in which the human body can maintain a constant body temperature regardless of increased environmental temperature. (2)
(9)

Downloaded from Stanmorephysics.com

3.3 Diabetes is a chronic disease where the body either cannot produce insulin (Type 1 Diabetes) or cannot use insulin effectively (Type 2 Diabetes). Managing diabetes often requires frequent monitoring of blood glucose levels to avoid complications such as nerve damage, kidney failure, or vision loss.

Traditional blood glucose monitoring involves finger-prick tests, which can be painful and inconvenient. New technologies, such as Continuous Glucose Monitors (CGM), have been developed to address this.

Instead of regular finger pricks, which occur once or twice a day, a CGM uses a small sensor inserted just under the skin, usually on the back of the upper arm. The sensor measures glucose levels in the tissue fluid (the fluid surrounding cells) every minute and transmits the data wirelessly to a smartphone or reader.

[Adapted from *https://www.freestyle.abbott/za-en/products/freestyle-libre-2.html*]

3.3.1 According to the text above, list TWO possible complications of diabetes. (2)

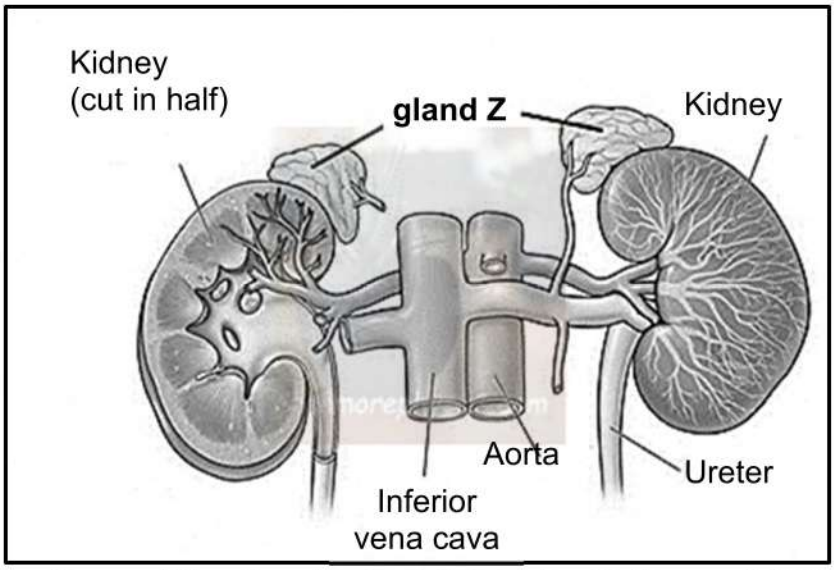
3.3.2 A Type 1 diabetes patient with a CGM receives an alert from her smartphone indicating that her blood glucose level is outside of normal limits. In response to the alert, she immediately injects herself with the required dose of insulin.

(a) State whether the smartphone alert warns her that her blood glucose level is too HIGH or too LOW. (1)

(b) Describe the role of the injected insulin in regulating her blood glucose levels. (3)
(6)

Downloaded from Stanmorephysics.com

3.4 The diagram below shows two glands in the human endocrine system. The glands secrete the hormones, aldosterone and adrenaline.



[Source: https://my.clevelandclinic.org/health/diseases/16448-hyperaldosteronism]

3.4.1 Give the definition of a *hormone*. (2)

3.4.2 Identify gland **Z**. (1)

3.4.3 Gland **Z** increases the secretion of adrenaline during a 'fight or flight' response.

(a) Name the part of the autonomic nervous system that is stimulated by an increase in the secretion of adrenaline. (1)

(b) Describe the effect that an increase in the secretion of adrenaline will have on the digestion of food in the stomach. (2)

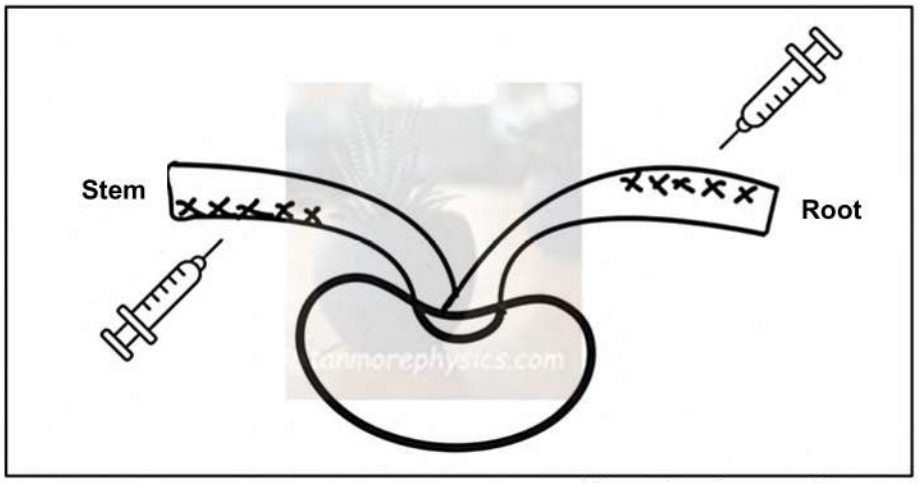
3.4.4 The normal aldosterone level is 7 ng/dL. A person who develops a tumour in gland **Z** experiences hyperaldosteronism (over-secretion of aldosterone). Hyperaldosteronism is confirmed with a blood test that shows an aldosterone level of 30 ng/dL.

Calculate the percentage increase in aldosterone level. Show ALL calculations. (3)
(9)

Downloaded from Stanmorephysics.com

3.5 An investigation was carried out where a germinating bean seed's young root and stem were injected with auxins in a dark and gravity-free environment aboard the International Space Station.

The tips of the young root and stem were cut off, and a high concentration of auxins was injected into the cells at the sites, as shown in the diagram below.



[Examiner's own diagram]

3.5.1 Define the term *tropism*. (2)

3.5.2 Explain the significance of cutting off the tips of the young roots and stems in this investigation. (3)

3.5.3 After injecting the auxins, as shown in the diagram, the seedling was left to grow for 10 days.

Redraw the germinating seed diagram and show the expected growth after 10 days. (3)

3.5.4 Give the name of the hormone that causes the germination of the bean seed. (1)

(9)

[50]

TOTAL SECTION B: 100

TOTAL: 150

END

Downloaded from Stanmorephysics.com

GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PREPARATORY EXAMINATION

2025

MARKING GUIDELINES

LIFE SCIENCES (PAPER 1) (10831)

13 pages

Downloaded from Stanmorephysics.com

Additional Notes to the marking Guidelines
Life Sciences P1

Question 1:

1.5.1 (c) – Accept: Hammer, Anvil and Stirrup (However, scientific terms should be taught)

1.7.2 (b) – Accept: Vasopressin

Question 2:

2.2.4 – Accept: Between 4 and 5 days.

2.4.1 – Accept: Between the uterus and the vagina

2.4.3 – Learners will lose marks for C and P if calculations are incorrect.

2.6 – if learners use the word/s **perilymph** and **endolymph** – Credit the learner in place of the word **fluid** in bullet 2.

Question 3

3.4.4 – accept ($\frac{23}{7}$)

Downloaded from Stanmorephysics.com

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.

Downloaded from Stanmorephysics.com

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 marking guidelines**
No changes must be made to the marking guidelines without consulting the provincial internal moderator.

Downloaded from Stanmorephysics.com

SECTION A

QUESTION 1

1.1 1.1.1 C ✓✓

1.1.2 B ✓✓

1.1.3 A ✓✓

1.1.4 B ✓✓

1.1.5 A ✓✓

1.1.6 D ✓✓

1.1.7 B ✓✓

1.1.8 D ✓✓

(8 x 2) **(16)**

1.2 1.2.1 Neurotransmitter ✓/acetylcholine/dopamine/seratonin

1.2.2 Prolactin ✓

1.2.3 Cranium ✓

1.2.4 Amniotic ✓ fluid

1.2.5 Negative feedback ✓

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

1.3 1.3.1 A only ✓✓

1.3.2 B only ✓✓

1.3.3 None ✓✓

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

1.4 1.4.1 Umbilical cord ✓ (1)

1.4.2 Oxygen✓ /O_2
Nutrients ✓ / glucose / $C_6H_{12}O_6$ / amino acids / vitamins / minerals
Water ✓ / H_2O
Antibodies ✓
Mark first TWO (2)

1.4.3 (a) Placenta ✓ (1)

(b) Diffusion ✓ (1)
(5)

Downloaded from Stanmorephysics.com

1.5	1.5.1	(a)	Pinna ✓	(1)
		(b)	Organ of Corti ✓/ Cochlea	(1)
		(c)	Ossicles ✓/Malleus, incus and stapes **Note: If ossicles are named, all three bones must be given, in any order, for 1 mark.**	(1)
	1.5.2	(a)	Eustachian tube ✓	(1)
		(b)	Grommet ✓	(1) **(5)**
1.6	1.6.1	(a)	C ✓ Yellow spot ✓/ Fovea / Fovea centralis	(2)
		(b)	G ✓ Cornea ✓	(2)
		(c)	B ✓ choroid ✓	(2)
	1.6.2		E ✓ and I ✓ **(Any order, mark first TWO only)**	(2) **(8)**
1.7	1.7.1		Osmoregulation ✓	(1)
	1.7.2	(a)	Pituitary ✓ gland / Hypophysis	(1)
		(b)	ADH ✓/ Antidiuretic hormone	(1)
		(c)	Kidney ✓	(1)
	1.7.3		Concentrated ✓	(1) **(5)**

TOTAL SECTION A 50

Downloaded from Stanmorephysics.com

SECTION B

QUESTION 2

2.1 2.1.1
- fusion of (male and female) gametes ✓
- inside the female's reproductive organ ✓ /body (2)

2.1.2 At birth/after hatching, the puggle:

- has no spines ✓ sticking out from its skin/naked
- eyes are closed ✓
- remains in its mother's pouch ✓/does not walk on its own/protection from predators
- feeds from milk from the mother ✓/does not look for its own food
- is kept inside a burrow ✓ for 7 months/protection from predators
- requires a large amount of parental care ✓

NOTE: Protection from predators can only be referred to ONCE
(Mark first TWO only) (2)

2.1.3

Vivipary	Ovipary
The embryo develops inside the female's reproductive organs✓/uterus	The embryo develops outside of the female's body in an amniotic egg ✓/The eggs are laid
The embryo receives a continuous supply of food/nutrients from the mother through the placenta ✓	Embryo receives a fixed amount of food/nutrients from the yolk ✓
Mother gives birth to live young ✓	Young hatch from an egg ✓
Waste from the embryo is removed through the placenta ✓ and is excreted from the mother's body.	Waste collects in the allantois ✓
Gaseous exchange occurs at the placenta ✓	Gaseous exchange occurs through the chorion ✓/shell/ outer covering
The embryo is protected inside the mother's body ✓	The embryo is protected by a shell ✓

(Mark first TWO comparisons only)
Table: columns with headings **T** ✓ (5)
(9)

Downloaded from Stanmorephysics.com

2.2 2.2.1 (a) Graafian Follicle ✓ (1)

(b) Corpus luteum ✓ (1)

2.2.2 (a) (Day) 14 ✓ (1)

(b) Graafian follicle/part A has ruptured ✓/ovum has been released from the Graafian follicle/part A (1)

2.2.3 (a) Progesterone ✓ (1)

(b)
- Maintains the thickness of the endometrium ✓/ causes the endometrium to become more vascular and glandular
- to prepare it for the implantation of the blastocyst ✓/ blastula /embryo (2)

2.2.4 4 days ✓ (1)

2.2.5
- Stimulates the development ✓/maturation
- of a primary/immature follicle ✓
- into a Graafian follicle ✓ (3)

(11)

2.3 2.3.1 (a) Urethra ✓ (1)

(b) Cowper's gland ✓ (1)

2.3.2 (a) Vas deferens ✓ (1)

(b) Penis ✓ (1)

2.3.3
- nutrients ✓ sugars/protein that provide energy for the sperm cells to move ✓
- alkaline fluid ✓ that neutralises the acid in the urethra/vagina ✓
- mucus ✓ for easier movement of sperm cells ✓/slippery tubes for easier passage of sperm cells

(**Mark first TWO only: Named secretion and its function**) (4)

(8)

Downloaded from Stanmorephysics.com

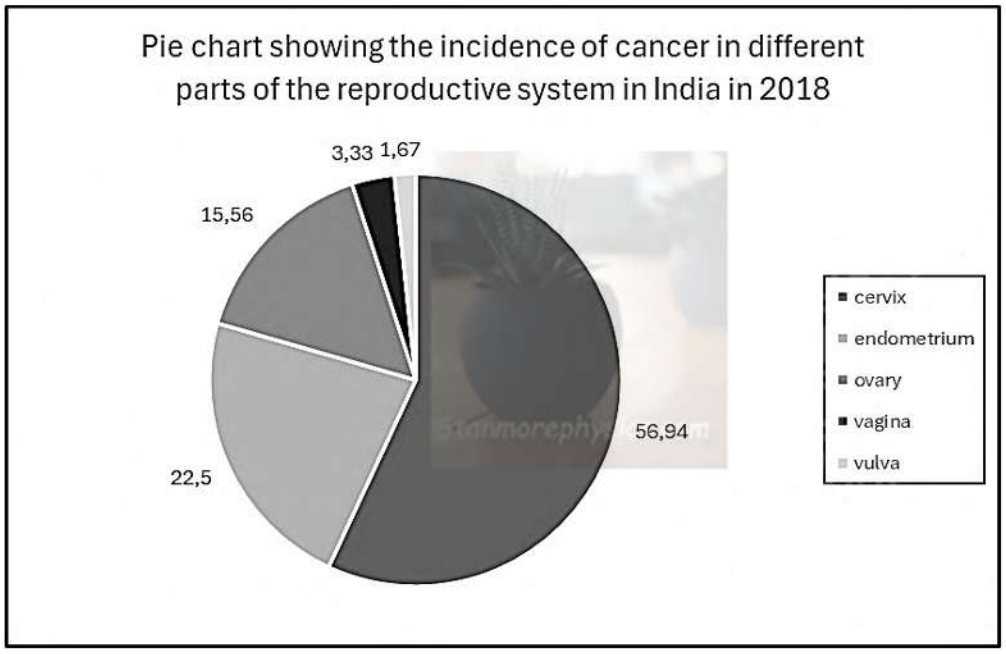
2.4 2.4.1 At the bottom/base/lower opening of the uterus ✓/top of the vagina (1)

2.4.2 Get permission from the participants ✓
Get permission from the hospital ✓
Decide:
- which disease to study ✓/type of cancer
- how to determine if the patient has cancer ✓
- how many participants to include in the study ✓/on the sample size
- how to collect/organise the data ✓
- the duration of the study ✓
- which hospitals to use ✓

(**Mark first TWO only**)
(NOTE: Ensure that statements are written in the future tense.) (2)

2.4.3 **Pie chart Calculations:**

Cervix:	56,94 / 100	x 360	= 204,98°	= 205°
Endometrium:	22,50 / 100	x 360	= 81°	
Ovary:	15,56 / 100	x 360	= 56,01°	= 56°
Vagina:	3,33 / 100	x 360	= 11,98°	= 12°
Vulva:	1,67 / 100	x 360	= 6,01°	= 6°



(6)

Downloaded from Stanmorephysics.com

Criteria	Elaboration	Symbol	Mark
Type	A pie chart is drawn: symmetrical circle drawn showing at least one segment	**T**	1
Caption	Correct caption including both variables.	**H**	1
Calculations	1– 4 calculations correct	**C**	1
	All 5 calculations are correct.		2
Proportions	1–3 sectors correct with a key/sectors labelled	**P**	1
	All sectors correct with a key / sectors labelled		2
		TOTAL:	**6**

(9)

2.5 2.5.1
- Uncorrected refractive error with cataract ✓
- Macular degeneration ✓
- Infectious disease ✓
- Vitamin A deficiency ✓

(Mark first TWO only) (2)

2.5.2
- Eyeball is longer than normal/inability of the lens to become less convex ✓/lens stays more convex
- Lens will bend/refract the light too much ✓/refractive power too high/light is focused in front of/before the retina (2)

2.5.3 (a) Biconcave ✓ /concave (1)

(b)
- Causes light to diverge before entering the eye ✓
- Reduces the angle that the light bends in the eye ✓/light rays are refracted less in the eye
- Ensures that light converges on the retina ✓/yellow spot / fovea / fovea centralis
- to form a clear image. ✓

any (2)
(7)

2.6 As the dancer spins her body:
- there is a change in the speed/direction ✓
- causing movement of the fluid in the inner ear ✓
- in the semi-circular canals ✓
- to stimulate the cristae ✓
- to convert the stimulus into an impulse ✓
- which is conducted by the auditory nerve ✓/vestibular nerve which is part of the auditory nerve
- to the cerebellum ✓
- which sends impulses to skeletal muscles✓/proprioceptors restore balance

Any (6)
(6)

Downloaded from Stanmorephysics.com

[50]

QUESTION 3

3.1 3.1.1 Central ✓ nervous system/ CNS (1)

3.1.2 Functional connection between the axon of one neuron and the dendrite of another neuron ✓✓ (2)

3.1.3 (a) interneuron ✓ (1)

(b) sensory ✓ neuron (1)

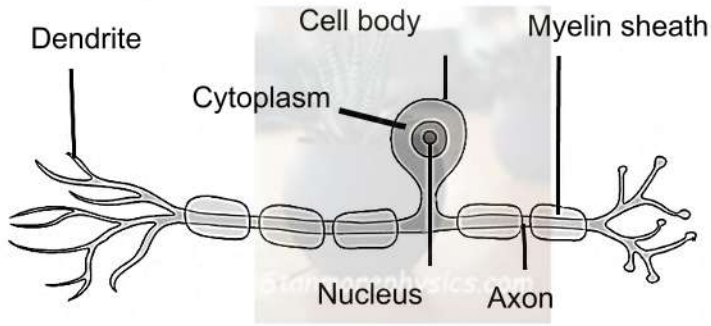
3.1.4 A reflex arc is the path taken by an impulse ✓ in response to a stimulus/ within a reflex action,
a reflex action is a quick and automatic/involuntary response ✓ to a stimulus (2)

3.1.5 G → A →D ✓✓ (2)

3.1.6
- The person would feel the heat ✓
- but will be unable to move their muscle ✓/hand away
- resulting in damage/burning/injury to the skin✓/tissues/finger/hand (3)

3.1.7

Diagram of a sensory neuron



Criteria	Elaboration	Symbol	Mark
Caption	The correct caption is given	**C**	1
Drawing	Correct neuron drawing (accept diagram with or without myelin sheath)	**D**	1
Labels	Any three correct labels: Axon, dendrite, cell body, cytoplasm, myelin sheath, nucleus, cell membrane	**L**	3
		TOTAL:	**5**

(5)
(17)

Downloaded from Stanmorephysics.com

3.2 3.2.1 Thermoregulation ✓ (1)

3.2.2 (a) Environmental temperature ✓ (1)

(b) Human core body temperature ✓ (1)

3.2.3
- **Ensure validity ✓***
- by ensuring that gender does not affect the results ✓
- by ensuring that the changes in the human core body temperature are due to the environmental temperature only ✓ and no other factor

(*compulsory mark + 1 other mark) (2)

3.2.4
- The investigation was done with a large sample of 26 participants ✓
- was repeated 3 times ✓
- an average was calculated. ✓

Any (2)

3.2.5
- Increased sweating ✓/sweat glands become more active
- Vasodilation of the blood vessels of the skin ✓ (2)

(9)

3.3 3.3.1
- Nerve damage ✓
- Kidney failure ✓
- Vision loss ✓

(Mark first TWO only) (2)

3.3.2 (a) (Too) High ✓ (1)

(b)
- It will stimulate cells to absorb more glucose ✓ to use for cellular respiration
- Insulin will stimulates the conversion of excess glucose into glycogen ✓ for storage
- In the liver ✓
- **Decreasing/lowers the blood glucose levels** ✓* until normal levels.

(1 compulsory mark + any two) (3)

(6)

3.4 3.4.1 A chemical messenger/messenger molecule that is secreted into the bloodstream ✓✓/ is responsible for chemical co-ordination that regulates activities in the body (2)

3.4.2 Adrenal ✓ gland (1)

3.4.3 (a) Sympathetic ✓ nervous system (1)

(b) It will decrease the amount of blood ✓ flow going towards the stomach, decreasing the amount of digestion taking place ✓/the digestion of food (2)

Downloaded from Stanmorephysics.com

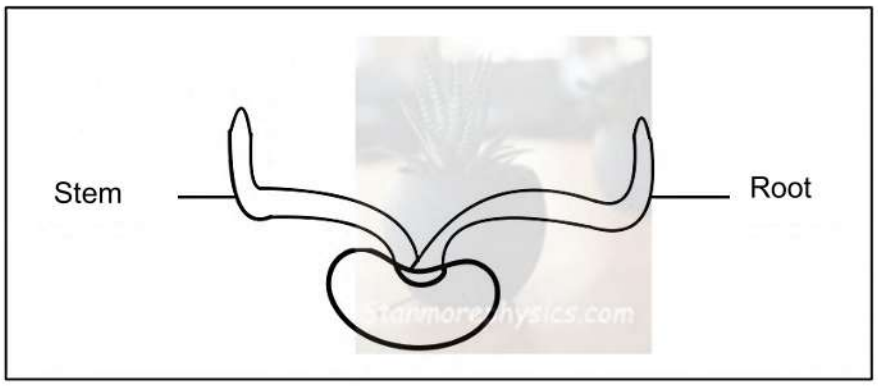
3.4.4 percentage increase = $\left(\frac{30-7}{7}\right)$ ✓ x 100 ✓ = 328,57 ✓ / 328,6 /329 % (3)
(9)

3.5 3.5.1 Growth/turning movement of a plant/part of a plant in response to a (external) stimulus ✓✓ (2)

3.5.2
- Auxins that are produced in the tips of roots and stems are removed ✓
- therefore, cannot diffuse/move through the stems and roots ✓/cannot interfere with the injected auxins ✓
- thereby eliminating the normal effects of auxins ✓/ensuring the effect of the auxins/growth direction is only due to injected auxins

Any (3)

3.5.3 Diagram showing the effect of auxins in the stem and root of a germinating seed (3)



Criteria	Elaboration	Symbol	Mark
Root	Correct drawing of growth of young root **growing upwards**	**R**	1
Stem	Correct drawing of growth of young stem **growing upwards**	**S**	1
Labels	Stem and root identified	**L**	1
		TOTAL	**(3)**

3.5.4 Gibberellins ✓ (1)
(9)
[50]

TOTAL SECTION B: 100

TOTAL: 150