Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjahabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2026

LIFE SCIENCES P1

MARKS: 150

TIME: 2½ hours

This question paper consists of 16 pages.

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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 answer 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. ALL drawings must be done in pencil and labelled 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. All calculations to be rounded off to TWO decimal places.
12. Write neatly and legibly.

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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–D) next to the question numbers (1.1.1 to 1.1.9) in the ANSWER BOOK, for example 1.1.10 D.

1.1.1 A disorder caused by iodine deficiency.

A Alzheimer's disease
B Diabetes mellitus
C Goitre
D Multiple sclerosis

1.1.2 The stage of development of the fertilised ovum in which implantation occurs.

A Morula
B Blastula
C Foetus
D Zygote

1.1.3 A light refractive disorder characterised by an irregularly shaped cornea or lens, distorting incoming light.

A Short-sightedness
B Cataracts
C Long-sightedness
D Astigmatism

1.1.4 A list of characteristics of body control systems is given below:

(i) Reaction to stimuli
(ii) Production and release of hormones
(iii) Slow, long-lasting responses
(iv) Involves the use of nerves

Which characteristics are exclusive to the endocrine system?

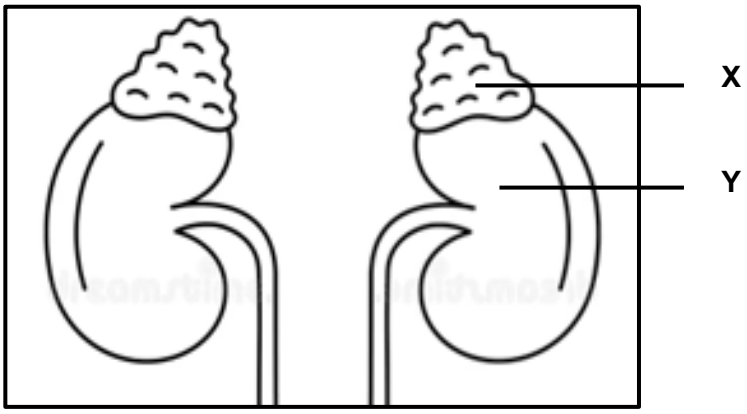
A (i) and (ii) only
B (i), (ii) and (iii) only
C (ii) and (iii) only
D (i), (ii), (iii) and (iv)

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1.1.5 Study the diagram of the kidneys and associated glands. Structures **X** and **Y** are shown.

Which row in the table below CORRECTLY identifies structures **X** and **Y**, as well as a hormone associated with each?



	X: Gland/Organ	**X:** Hormone	**Y:** Gland/Organ	**Y:** Hormone
A	Adrenal	Aldosterone	Kidney	Antidiuretic
B	Adrenal	Growth hormone	Kidney	Adrenaline
C	Kidney	Aldosterone	Adrenal	Antidiuretic
D	Kidney	Growth hormone	Adrenal	Adrenaline

1.1.6 Which of the hormones listed will contribute to the functioning of the sympathetic nervous system?

A Antidiuretic hormone
B Aldosterone
C Growth hormone
D Adrenaline

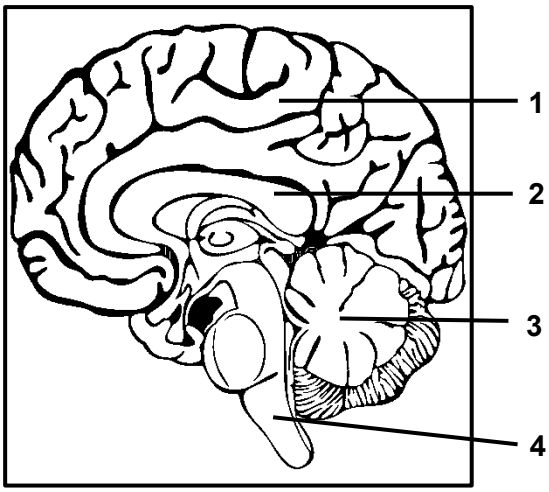
1.1.7 The structure which acts as a partial barrier that reduces the risk of HIV from passing form the mother to the developing foetus.

A Amnion
B Placenta
C Umbilical Cord
D Chorion

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1.1.8 A cross section of the human brain is given below.



Which ONE of the following options correctly shows the functions of the labelled parts (1, 2, 3 and 4) of the human brain?

	1	2	3	4
A	Controls breathing	Regulates body temperature	Balance and posture	Heartbeat regulation
B	Controls involuntary actions	Neural interface between left and right hemispheres	Thinking and memory	Balance and posture
C	Controls voluntary actions	Connection between left and right hemispheres	Governs precise motor control	Life processes
D	Controls balance	Voluntary movement	Involuntary movement	Emotion and memory

1.1.9 After eating a meal rich in carbohydrates, how does insulin help keep blood sugar levels normal?

A Breaks down glycogen in the liver
B Stimulates the liver to convert glucose to glycogen
C Increases glucagon secretion
D Converts glucose to glycogen (9 x 2) (18)

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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 1.2.8) in the ANSWER BOOK.

1.2.1 Forms a common tubule for the release of urine and semen outside the male body

1.2.2 The structural and functional unit of the nervous system

1.2.3 Collective term for the glands that contribute to the formation of semen

1.2.4 Hormone that stimulates breast development and milk production

1.2.5 Specialised cell, nerve ending, or protein molecule that detects specific stimuli

1.2.6 Process that controls the amount of light entering the eye

1.2.7 Plant stress hormone, responsible for closing stomatal pores when a plant is experiencing excessive water loss

1.2.8 Homeostatic process that counteracts changes from a set point (8 x 1) (8)

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 numbers (1.3.1 to 1.3.3) in the ANSWER BOOK.

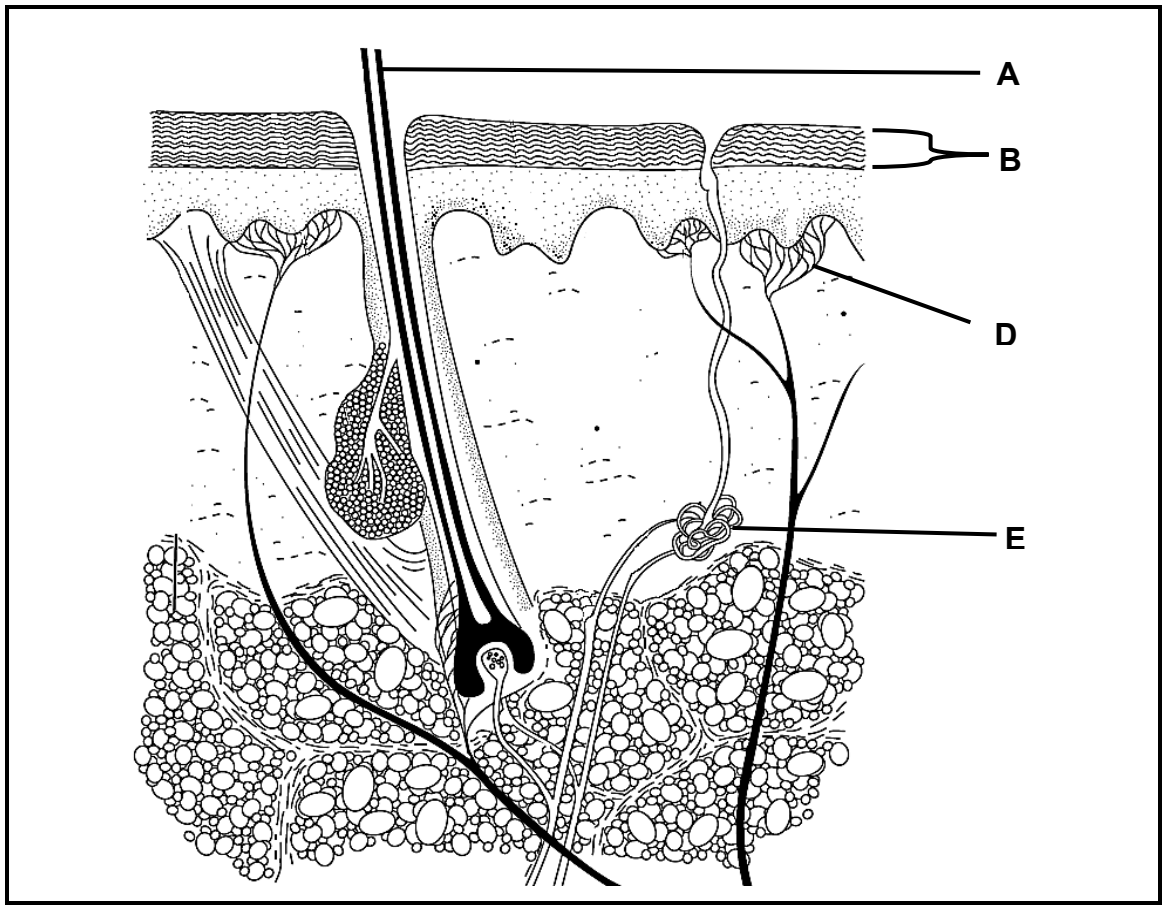
	COLUMN I	COLUMN II
1.3.1	Effectors used in regulation of high CO_2 levels in the blood	A: Pancreas B: Diaphragm
1.3.2	Function(s) of the epididymis	A: Store spermatozoa B: Maturation of spermatozoa
1.3.3	Hormone(s) that increase the rate of glucose metabolism	A: Glucagon B: Thyroxin
1.3.4	At the onset of puberty, the following events start to take place in a female	A: Gametogenesis B: Narrowing of hips

(4 x 2) (8)

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1.4 The diagram below shows a cross section of the human skin.



1.4.1 Define the term *thermoregulation*. (2)

1.4.2 Provide labels for the following parts:

(a) **A** (1)

(b) **D** (1)

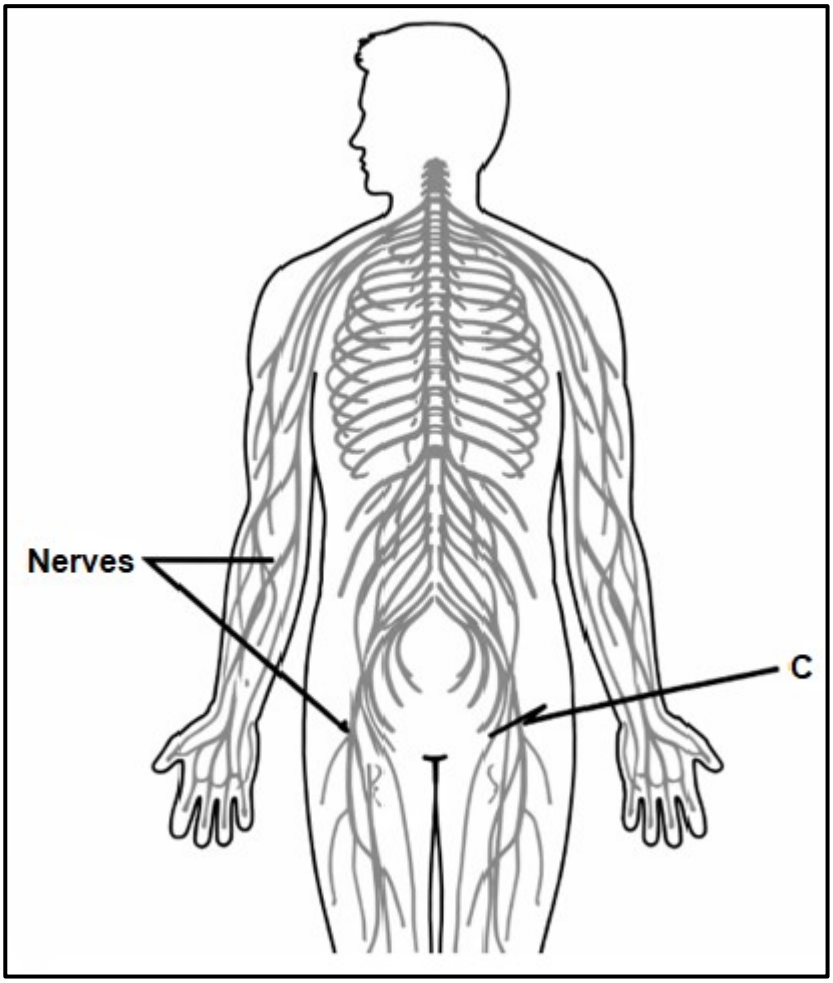
1.4.3 Give TWO visible features in the diagram that indicate that a cold day is being experienced. (2)

1.4.4 Name the part of the brain that controls thermoregulation. (1)

1.4.5 List TWO negative effects if the body is unable to limit heat loss. (2)

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1.5 The diagram below represents the human nervous system.



1.5.1 To which nervous system do the above nerves belong? (1)

1.5.2 State TWO important functions of the nervous system mentioned in QUESTION 1.5.1. (2)

1.5.3 Name the:

(a) Nerves that carry impulses to and from the spinal cord (1)

(b) Structure through which the motor neurons leave the spinal cord (1)

1.5.4 State TWO effects on the individual if the motor neurons at point **C** are cut. (2)

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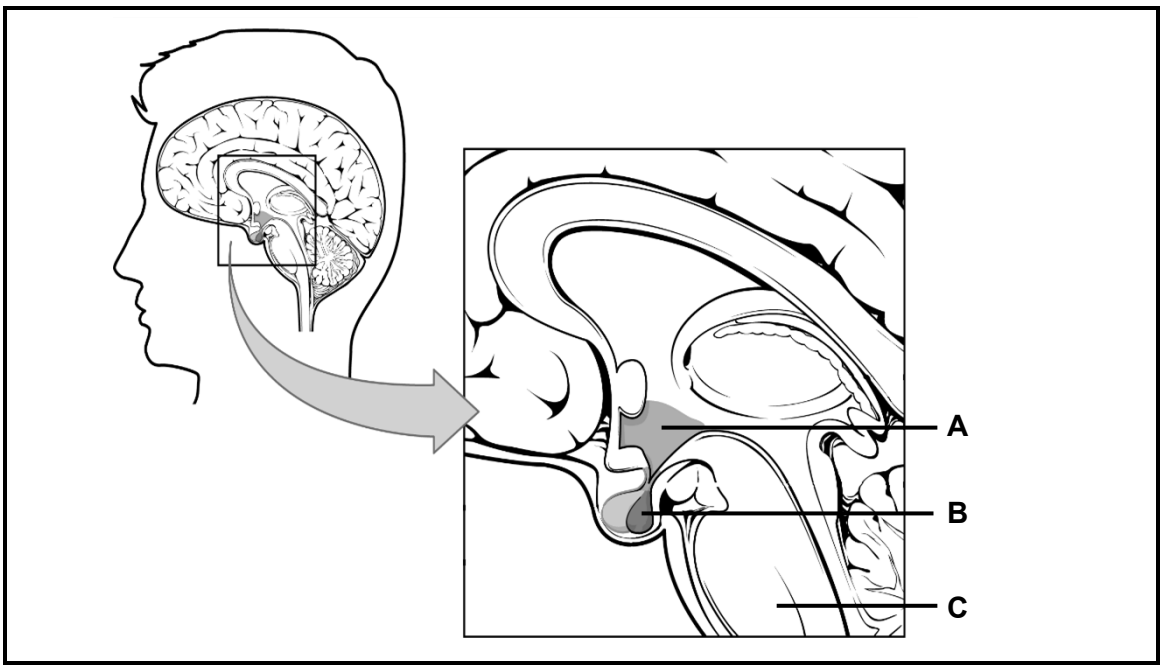
TOTAL SECTION A: 50

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SECTION B

QUESTION 2

2.1 The diagram below shows various components of structures inside the skull.



2.1.1 Identify the glands labelled:

(a) **A** (1)

(b) **B** (1)

2.1.2 Are the secretions of gland **B** considered endocrine or exocrine? Supply TWO reasons with your answer. (3)

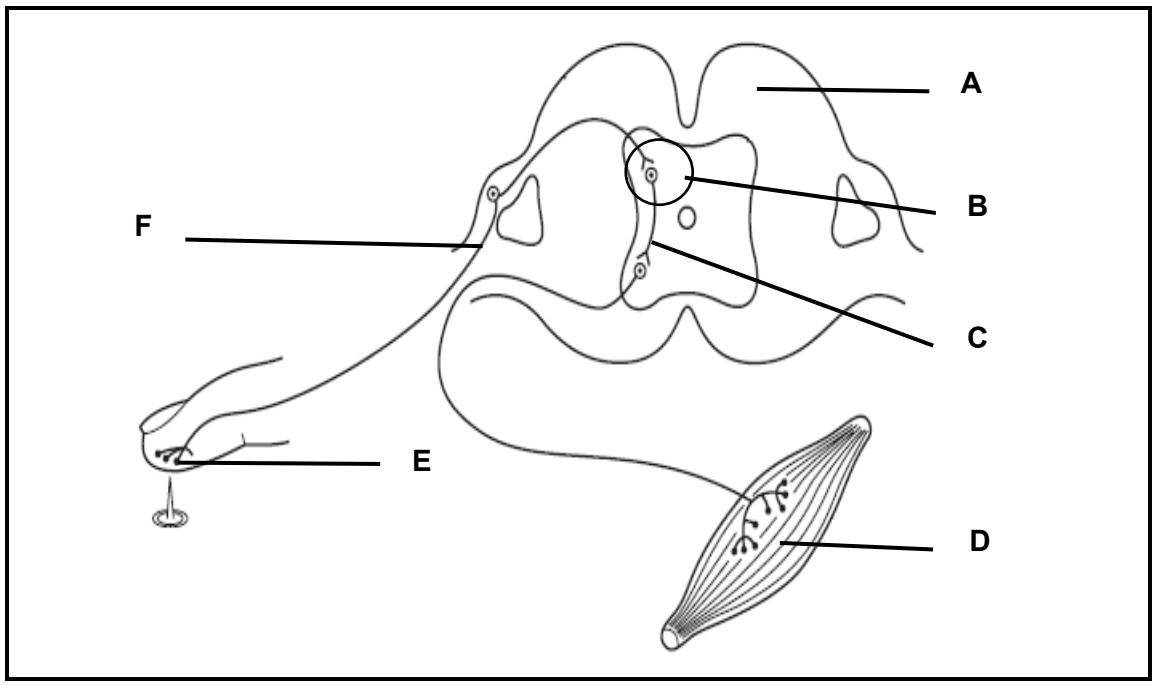
2.1.3 Describe the roles played by **A** and **B** when the water level in the blood decreases below normal levels. (4)

2.1.4 Explain TWO reasons why **C** is considered an important part of the autonomic nervous system. (4)

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2.2 The diagram below represents part of a reflex arc.



2.2.1 Give the correct labels for the following parts:

(a) **D** (1)

(b) **E** (1)

2.2.2 Define the term *reflex action.* (2)

2.2.3 List TWO functions of connection **B** between neurons. (2)

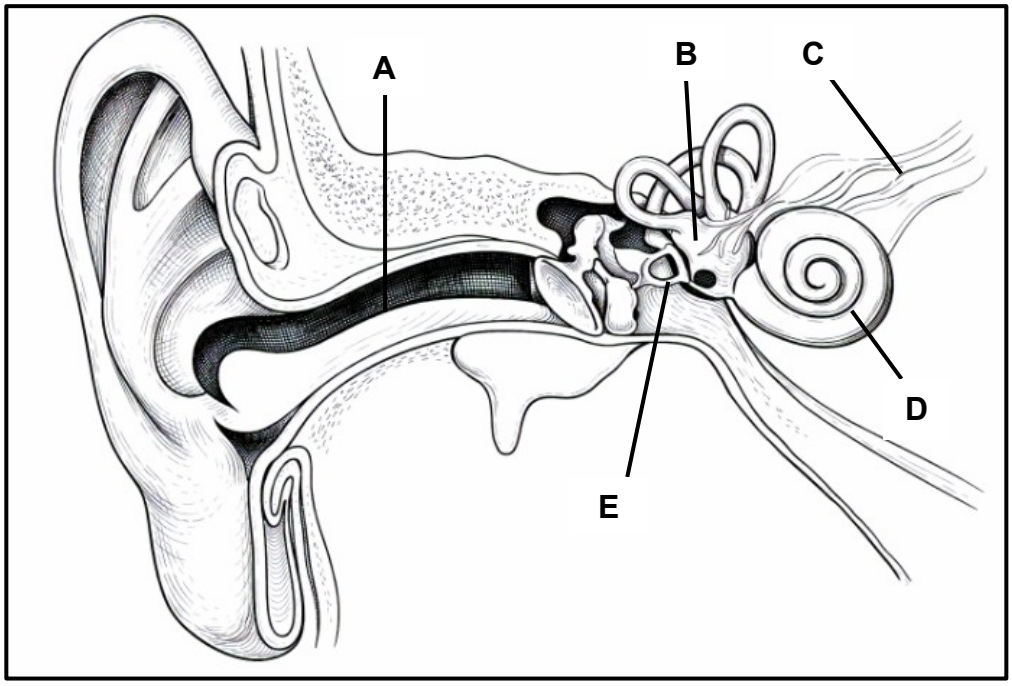
2.2.4 Tabulate TWO differences between neuron **C** and neuron **F**. (5)

2.2.5 (a) Name the region of the spinal cord labelled **A**. (1)

(b) Explain the role of this region in transmitting nerve impulses. (2)

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2.3 The diagram below shows a cross section through the human ear.



2.3.1 Identify part:

(a) **C** (1)

(b) **E** (1)

2.3.2 State the difference between the type of waves found in parts **A** and **D**. (2)

2.3.3 Identify the part involved in static balance and describe how balance is restored when the head tilts or moves in a straight direction. (4)

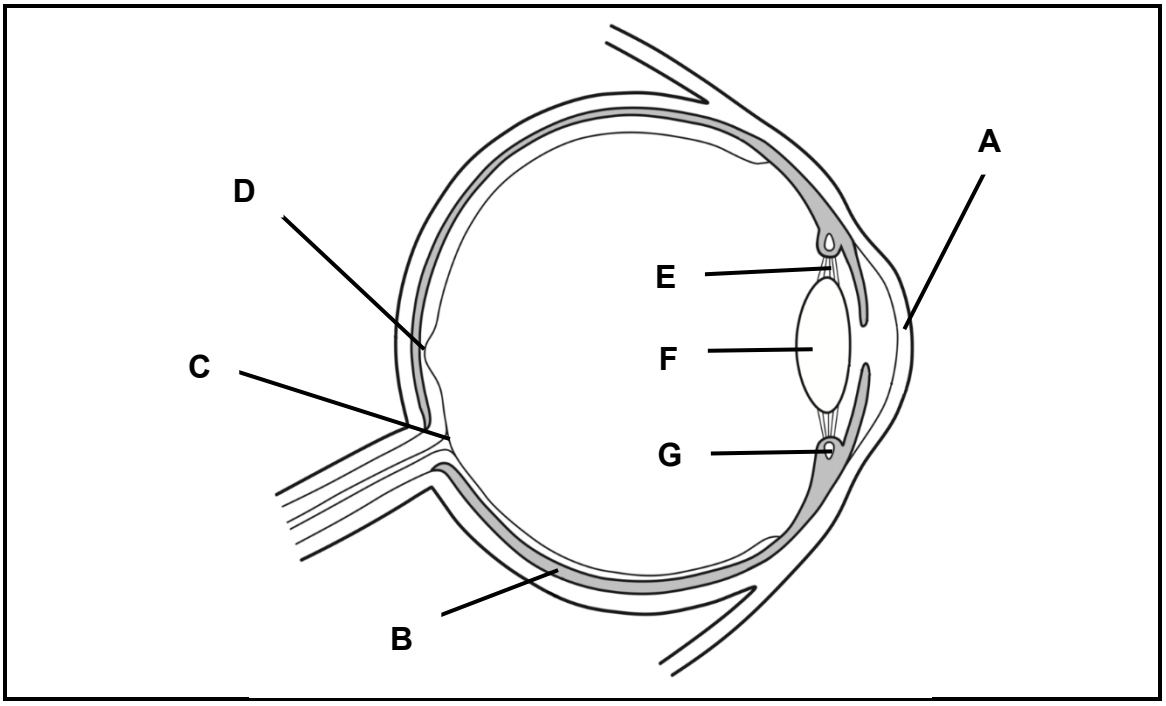
2.3.4 A person has damage to the cochlea.

Explain how this damage will affect the person's ability to hear. (5)

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2.4 The diagram below shows a cross section of the human eye.



2.4.1 Identify part:

(a) **A** (1)

(b) **D** (1)

2.4.2 Describe the changes of parts **E**, **F** and **G** when focusing on an object more than 6 m away. (3)

2.4.3 Explain ONE reason why part **C** is referred to as the blind spot. (2)

2.4.4 An ophthalmologist (eye specialist) has diagnosed a patient with choroideremia, a condition in which the blood supply to part of the eye is reduced.

(a) Identify the LETTER of the part of the eye affected. (1)

(b) Explain why this condition may cause blurred vision. (2)

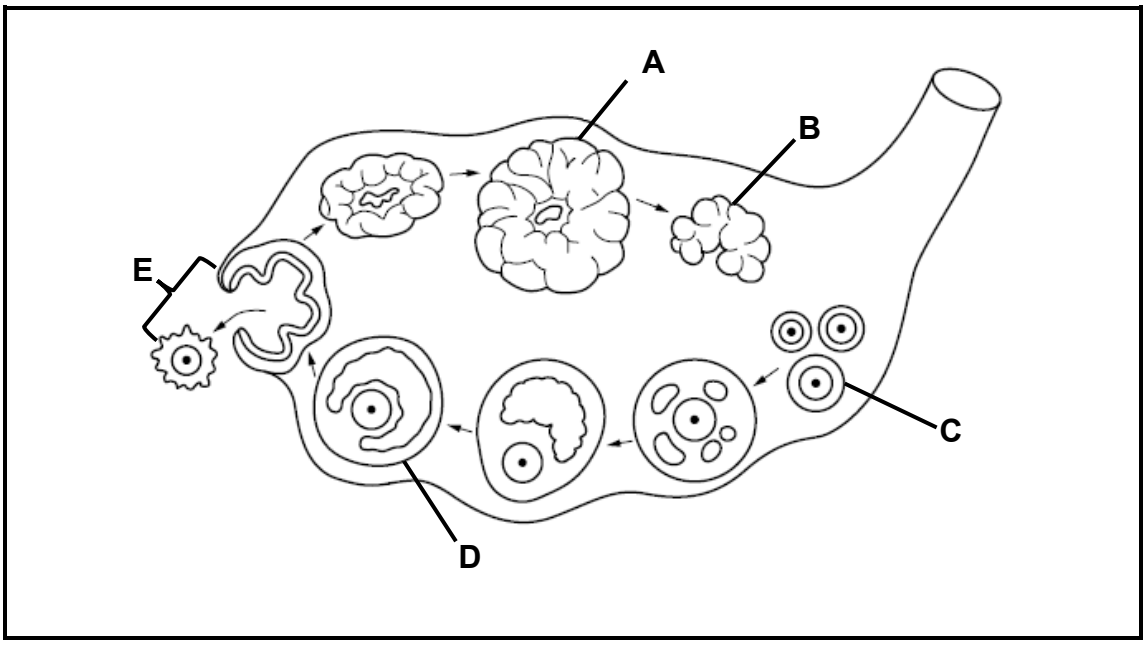
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QUESTION 3

3.1 The diagram below shows a cross section of an ovary.



3.1.1 Identify structure **D**. (1)

3.1.2 Name the process occurring at **E**. (1)

3.1.3 Explain how structure **C** is formed. (2)

3.1.4 Over time structure **A** changes into structure **B**.

(a) State the cause of this change. (1)

(b) Explain the effect of this change on the menstrual cycle. (2)

3.1.5 Explain TWO roles of the hormones secreted by structures **A** and **D** in regulating the menstrual cycle. (4)

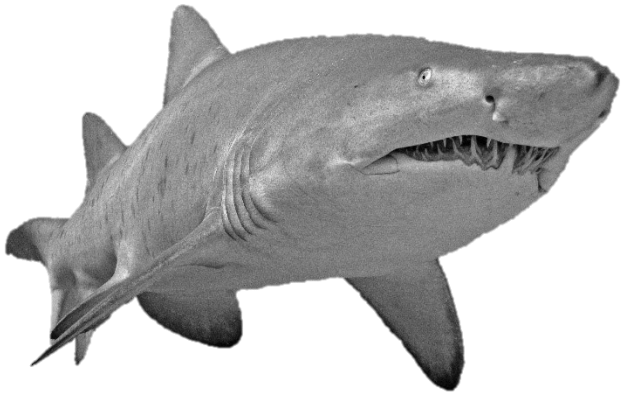
3.1.6 Polycystic ovarian disease may require an oophorectomy (removal of the ovary) in severe cases.

If both ovaries are removed, discuss how this will affect the natural menstrual cycle. (4)

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3.2 Read the extract of the Tiger Shark (*Carcharias taurus*).



Carcharias taurus (commonly known as the ragged-tooth shark or sand tiger shark) lives in South African coastal waters. There are usually more males than females. During the breeding season (spring to early summer), several males may mate with one female. Males use special structures called claspers to transfer sperm into the female's body. The female has two uteri where eggs are fertilised and develop. At first, embryos use yolk for nutrition. Later, the strongest embryo eats other eggs and smaller embryos (oophagy). The gestation lasts approximately 6–9 months. The female gives birth every two years to one or two large pups (one in each uterus). The pups are independent at birth and receive no parental care.

3.2.1 Identify TWO adaptations of *Carcharias taurus* that increase the chances of internal fertilisation. (2)

3.2.2 Describe the developmental state of *Carcharias taurus* at birth. Give a reason for your answer. (2)

3.2.3 Define the term *ovovivipary*. (2)

3.2.4 Explain why oophagy increases the survival and reproductive success of *Carcharias taurus*. (2)

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3.3 Study the scientific investigation below.

NESTORONE AND TESTOSTERONE (NES/T) SKIN GEL AS A MALE HORMONAL CONTRACEPTIVE

NES/T is a gel applied daily to the skin and absorbed into the body. Scientists are testing it as a male contraceptive. They wanted to determine how different amounts of Nestorone (NES), together with testosterone (T), affect sperm production.

Experiment design

- 99 healthy adult males, aged 18–50 years, were used.
- The males were divided into three equal groups.
- **Group A**: received a testosterone gel with a placebo.
- **Group B**: received a gel containing testosterone and 8 mg Nestorone.
- **Group C**: received a gel containing testosterone and 12 mg Nestorone.
- All participants applied the gel once a day after an evening shower.
- The investigation lasted 24 weeks.
- At the start, sperm production was recorded as 100% for all groups.
- Every 6 weeks, semen samples were collected to determine the percentage reduction in sperm production.

Results

	Week 6	Week 12	Week 18	Week 24
Group A	18	21	24	26
Group B	61	74	82	89
Group C	62	71	80	88

Table showing percentage reduction in sperm production

3.3.1 Identify the following from the given investigation:

(a) Independent variable (1)

(b) ONE controlled (fixed) variable (1)

(c) How the dependent variable was measured (1)

3.3.2 State the purpose of the control of this investigation (2)

3.3.3 Describe ONE reason why NES/T gel includes synthetic (artificial) testosterone. (2)

3.3.4 Draw a bar graph to show the percentage reduction in sperm production in group **B** over the 24-weeks. (6)

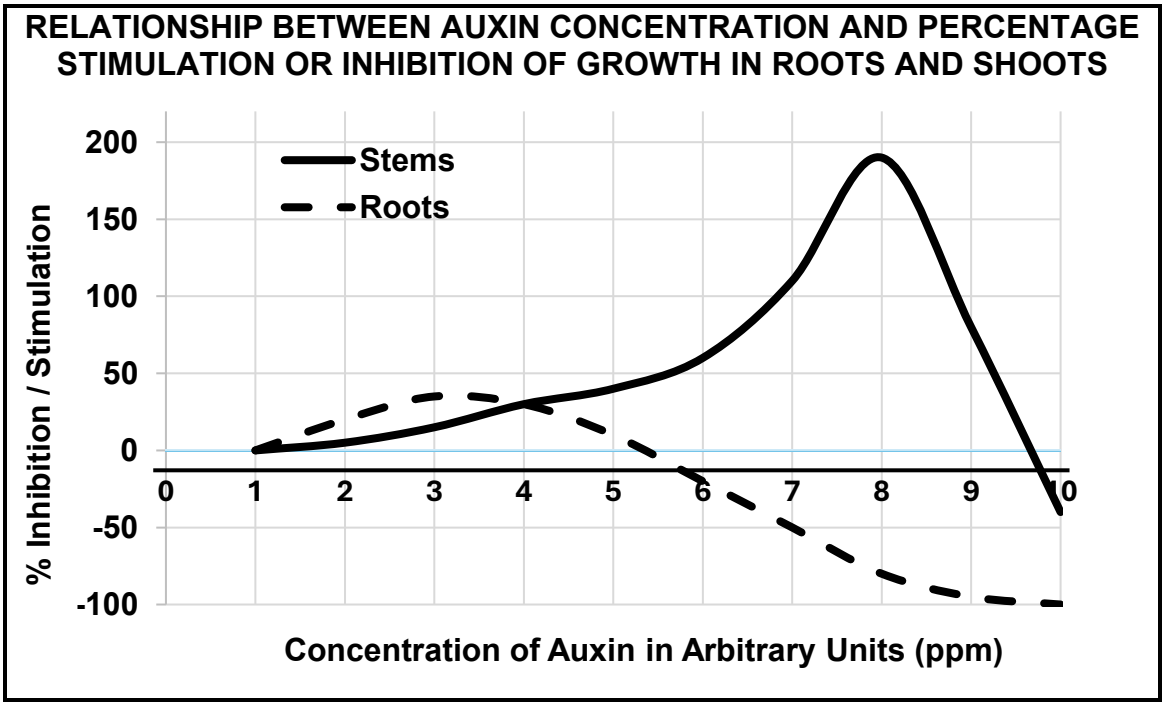
3.3.5 Some men are unsure about using NES/T as a contraceptive.

Using the data, give ONE reason for this. (2)

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3.4 Study the graph below.



3.4.1 Define the term *tropism*. (2)

3.4.2 A plant stem is exposed to unilateral light.

(a) Using the graph, identify a range of auxin concentration (any 2 units) on the shaded side of the stem. (2)

(b) Describe how the stem will grow. (2)

3.4.3 Compare how roots and shoots respond to increasing auxin concentration. (4)

3.4.4 Explain how auxin can be used to control weeds. (2)
[50]

TOTAL SECTION B: 100
GRAND TOTAL: 150

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