basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

LIFE SCIENCES P1

MAY/JUNE 2026

MARKS: 150

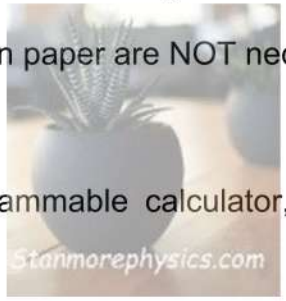
TIME: 2½ hours

This question paper consists of 18 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, 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 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 1.1.9) in the ANSWER BOOK, e.g. 1.1.10 D.

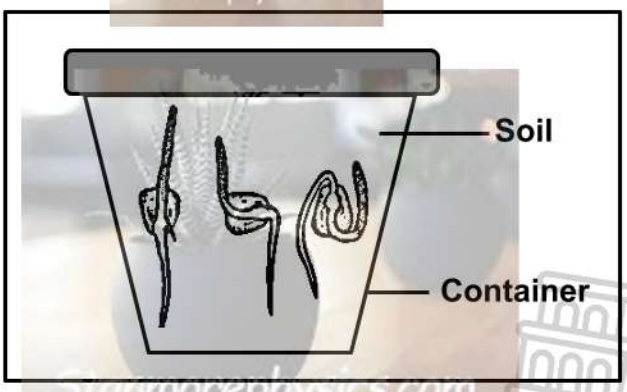
1.1.1 In plants, gibberellins are responsible for …

A tropisms.
B seed dormancy.
C growth of lateral branches.
D seed germination.

1.1.2 Which of the following structures provide nutrients for the developing foetus?

A Placenta and umbilical artery
B Amnion and umbilical vein
C Placenta and umbilical vein
D Amnion and umbilical artery

1.1.3 The diagram below shows germinating seeds in a non-transparent (opaque) container.



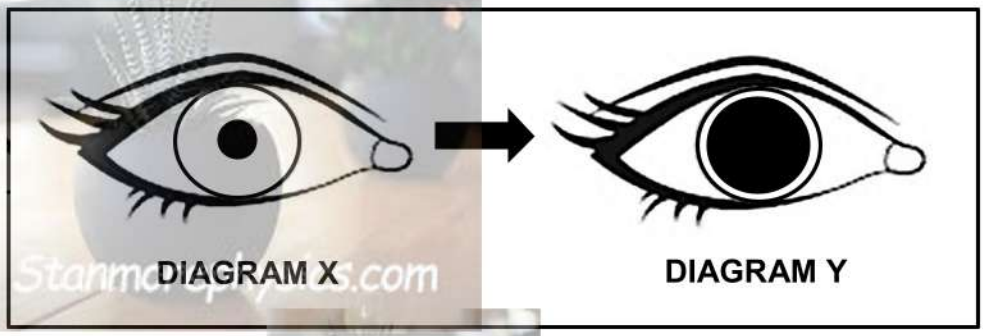
Which ONE of the following statements CORRECTLY describes the growth response of the seeds?

A Stems grow upwards due to apical dominance.
B Roots grow downwards due to geotropism.
C Stems grow upwards due to phototropism.
D Roots grow downwards due to phototropism.

1.1.4 The jelly layer of a human ovum …

A secretes hormones required for fertilisation.
B fuses with the nucleus of a sperm to form a zygote.
C provides protection to the fertilised ovum.
D secretes hormones required for implantation.

1.1.5 The diagrams below show the change in the size of the pupil from diagram **X** to diagram **Y**.



Which ONE of the following combinations of light conditions and muscle actions CORRECTLY describes the response shown above?

	LIGHT CONDITION	CIRCULAR MUSCLES	RADIAL MUSCLES
A	Bright light	Contract	Relax
B	Dim light	Contract	Relax
C	Bright light	Relax	Contract
D	Dim light	Relax	Contract

1.1.6 Which ONE of the following may be a reason for hearing loss in people with middle-ear infection?

A There is excess air inside the Eustachian tube.
B The auditory nerve is damaged.
C The ossicles cannot vibrate freely.
D Sound waves do not reach the tympanic membrane.

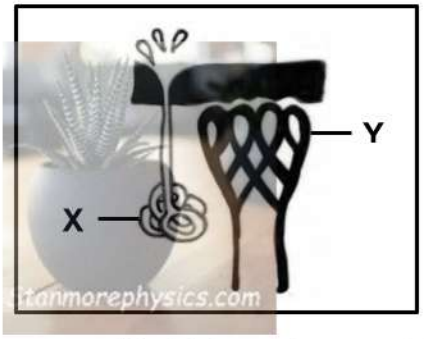
1.1.7 The following is a list of functions of plant hormones:

(i) Promotes seed dormancy
(ii) Acts as a weed killer
(iii) Causes the falling of leaves
(iv) Promotes cell division

Which combination of functions describes the role of abscisic acid?

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

1.1.8 The diagram below shows parts of the skin involved in thermoregulation.



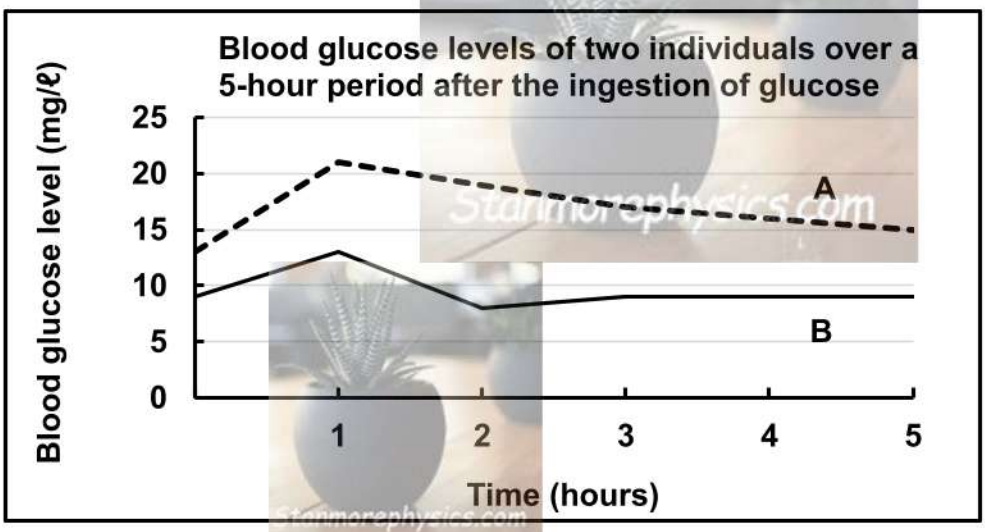
When a person is exposed to high environmental temperatures, the hypothalamus stimulates …

A vasodilation in **Y** and decreased sweat secretion by **X**.
B vasoconstriction in **Y** and increased sweat secretion by **X**.
C vasodilation in **Y** and increased sweat secretion by **X**.
D vasoconstriction in **Y** and decreased sweat secretion by **X**.

1.1.9 Note the following for an investigation:

- Two individuals, **A** and **B**, had not eaten for four hours prior to the investigation.
- They then ingested 15 grams of pure glucose.
- One of the individuals has untreated diabetes mellitus.

The graphs below show the blood glucose levels of the two individuals over a period of 5 hours after the glucose has been ingested.



Which statement regarding the information in the graphs is CORRECT?

A The insulin levels of individual **A** will remain high.
B Individual **B** has diabetes mellitus because the glucose levels dropped to below 10 mg/ℓ.
C The insulin levels of individual **B** will remain constant.
D Individual **A** has diabetes mellitus because the glucose levels remain above 10 mg/ℓ. (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 1.2.8) in the ANSWER BOOK.

1.2.1 The process where the change in the level of one hormone brings about an opposite response in the level of another hormone

1.2.2 The part of a sperm cell that contains enzymes which dissolve the ovum membrane

1.2.3 A mature follicle inside the ovary that contains the ovum

1.2.4 The group of cells in the pancreas that perform an endocrine function

1.2.5 A visual defect caused by the uneven curvature of the cornea

1.2.6 Receptors in the inner ear that are stimulated by a change in the position of the head

1.2.7 The hormone that stimulates milk production

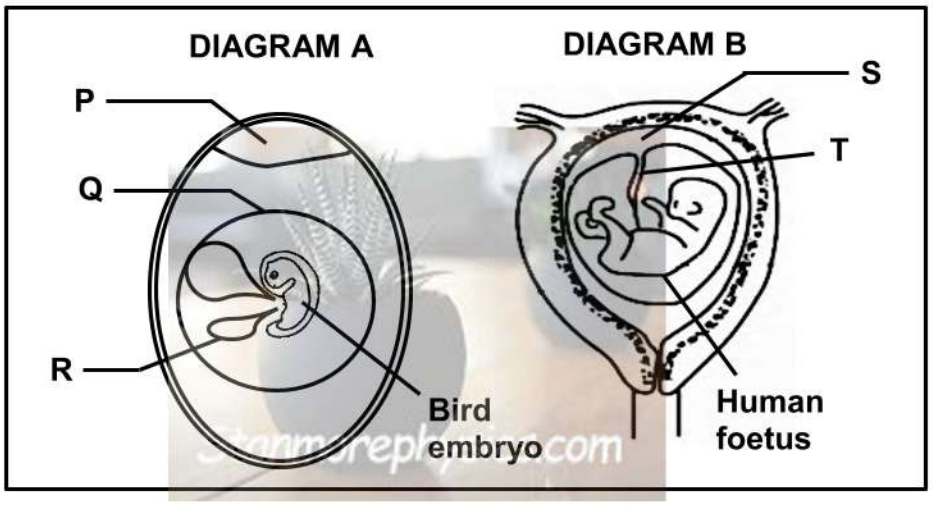
1.2.8 The branch of the nervous system that comprises spinal and cranial nerves (8 x 1) **(8)**

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 numbers (1.3.1 to 1.3.3) in the ANSWER BOOK.

	COLUMN I	COLUMN II
1.3.1	Part of the human body influenced by growth hormone	A: Muscles B: Skeleton
1.3.2	Chicks hatch without feathers	A: No parental care B: Altricial development
1.3.3	Responsible for the secondary sexual characteristics during puberty	A: FSH B: LH

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

1.4 The diagrams below represent stages in the reproduction of vertebrates.

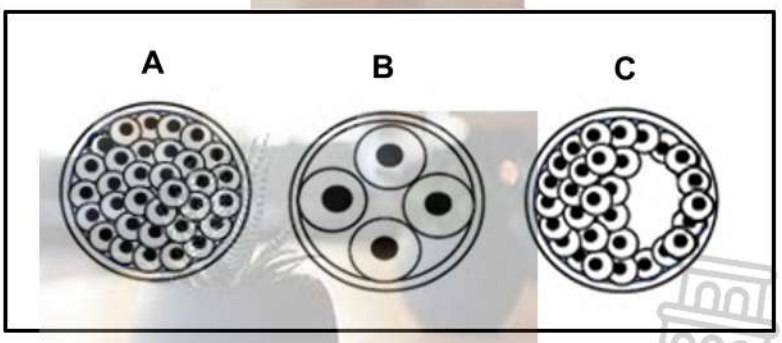


1.4.1 Identify **P**. (1)

1.4.2 Write the LETTERS of ALL the parts that are involved with the removal of waste products from the developing embryo and foetus. (3)

1.4.3 Name TWO reproductive strategies that occur in humans. (2)
(6)

1.5 Diagrams **A**, **B** and **C** below represent different stages of human embryonic development. The stages are NOT shown in the correct order.



1.5.1 Identify stage:

(a) **A** (1)

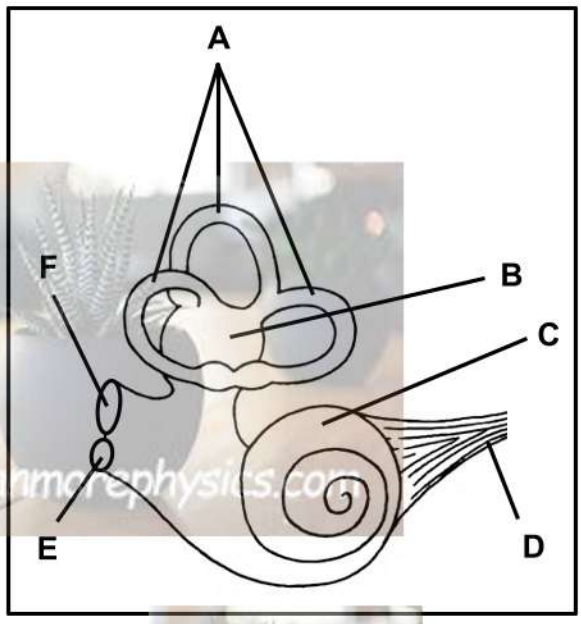
(b) **C** (1)

1.5.2 Identify the type of cell division responsible for the formation of the different stages. (1)

1.5.3 Give the LETTER of the embryonic stage that implants in the endometrium. (1)

1.5.4 Use the letters **A**, **B** and **C** to arrange the stages in the CORRECT order of development. (2)
(6)

1.6 The diagram below shows the structure of the inner ear.



1.6.1 Identify part:

(a) **A** (1)

(b) **D** (1)

1.6.2 Give the LETTER and NAME of the part that:

(a) Receives vibrations from the middle ear (2)

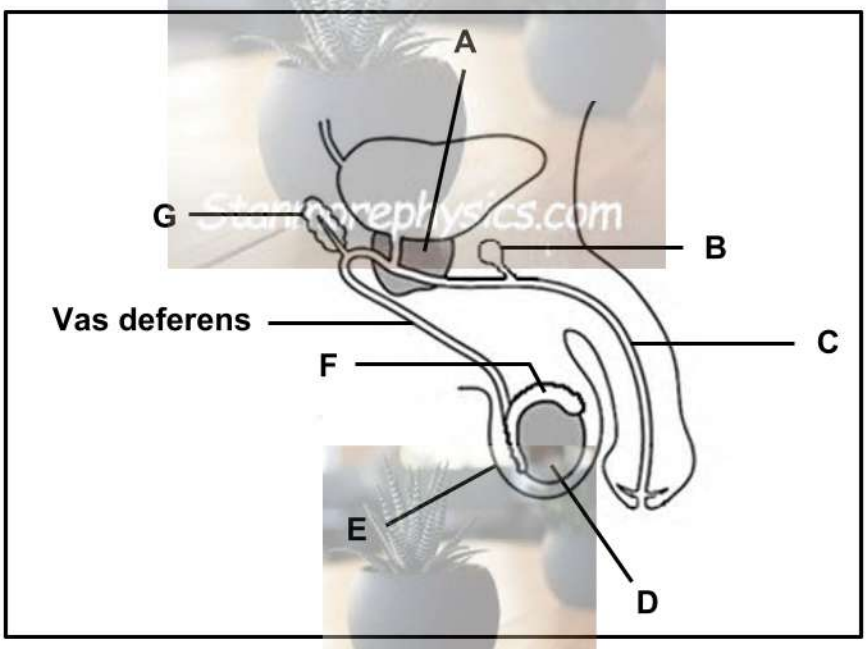
(b) Contains the organ of Corti (2)
(6)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 The diagram below represents the male reproductive system.



2.1.1 Identify part:

(a) **D** (1)

(b) **E** (1)

2.1.2 Give the LETTER and NAME of the part that:

(a) Stores sperm until maturation (2)

(b) Transports semen out of the body (2)

2.1.3 Name TWO exocrine glands visible in the diagram. (2)

2.1.4 Fertility is the capacity to reproduce. Due to an infection, both vas differentia (plural for 'vas deferens') become blocked.

Explain how this blockage affects fertility. (3)
(11)

2.2 Read the extract below.

PITUITARY TUMOURS

In women, pituitary tumours form due to the abnormal growth of tissue in the pituitary gland. These tumours secrete excess levels of follicle stimulating hormone (FSH) which increase as the tumour grows larger.

The pressure on the pituitary gland by the tumour may also result in very low levels of luteinising hormone (LH) in the blood. The FSH levels in the blood can only return to normal after surgical removal or radiation of the tumour.

2.2.1 Identify the target organ of FSH. (1)

2.2.2 According to the information, state:

(a) The relationship between the size of a pituitary tumour and FSH secretion (1)

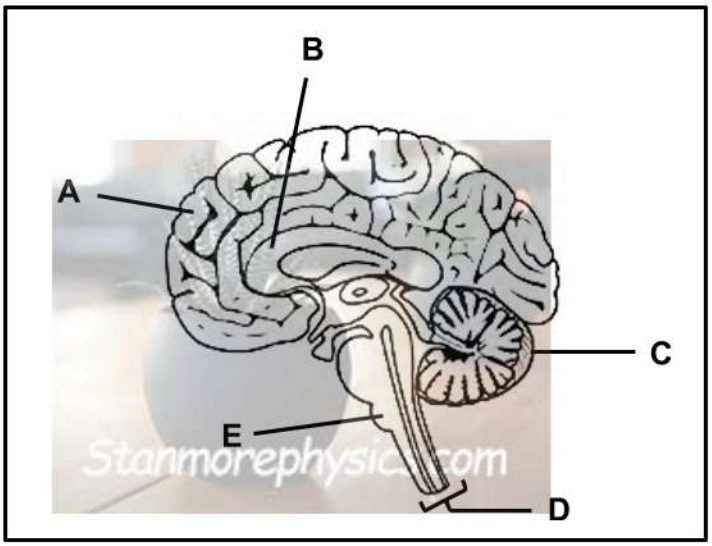
(b) ONE way in which normal FSH levels can be restored (1)

2.2.3 Explain how low levels of LH may reduce the chances of pregnancy in a woman with a pituitary tumour. (2)

2.2.4 Describe how high levels of FSH are normally controlled in a female. (6)
(11)

2.3 Describe the process of *oogenesis*. **(5)**

2.4 The diagram below represents a part of the human central nervous system.



2.4.1 Identify part:

(a) **B** (1)

(b) **E** (1)

2.4.2 Give the collective name for the membranes that protect the central nervous system. (1)

2.4.3 Give the LETTER and NAME of the part that:

(a) Interprets impulses received from the eye (2)

(b) Coordinates all voluntary actions (2)

2.4.4 A person suffered an injury to structure **D**.

Explain why this person is unable to walk. (4)
(11)

2.5 Good hand-eye coordination is essential to perform well in sports. Athletes can be trained to improve their hand-eye coordination.

An investigation was conducted to determine the effect of performance training on hand-eye coordination.

The procedure was as follows:

- Five girls, all 11 years old, were selected as participants.
- A ball-catch test was conducted to measure their hand-eye coordination where:
  - The girls bounced a rubber ball off a wall while standing 2 m away and they were required to catch the ball each time it bounced back
  - The number of successful catches in 30 seconds was recorded
  - The test was repeated three times and an average was calculated
- All the girls then participated in a performance-training programme for six weeks, with training sessions held twice a week.
- The ball-catch test was then repeated on completion of the performance training.

The results of the ball-catch tests are recorded in the table below.

PARTICIPANT	AVERAGE NUMBER OF SUCCESSFUL BALL CATCHES IN 30 SECONDS	
	BEFORE TRAINING	AFTER TRAINING
A	3	7
B	4	8
C	3	6
D	5	9
E	4	7

2.5.1 Identify the:

(a) Independent variable (1)

(b) Dependent variable (1)

2.5.2 How many training sessions did each of the girls participate in? (1)

2.5.3 What was the purpose of the ball-catch test? (1)

2.5.4 State THREE ways in which the validity of the investigation was ensured. (3)

2.5.5 Describe ONE way in which the reliability of the investigation can be improved. (1)

2.5.6 Explain the results of the investigation. (2)

2.5.7 State the conclusion for this investigation. (2)
(12)
[50]

QUESTION 3

3.1 The table below shows the occurrence of multiple sclerosis (MS) in men and women in different age groups.

NUMBER OF PEOPLE IN DIFFERENT AGE GROUPS WITH MULTIPLE SCLEROSIS (per 100 000 people)		
AGE GROUP (YEARS)	**MEN**	**WOMEN**
14 to 19	0	0
20 to 29	40	70
30 to 39	150	250
40 to 49	235	450
50 to 59	290	620
60 to 69	400	600
70 to 79	150	240

3.1.1 Name:

(a) The specialised cells in the nervous system that are affected by MS (1)

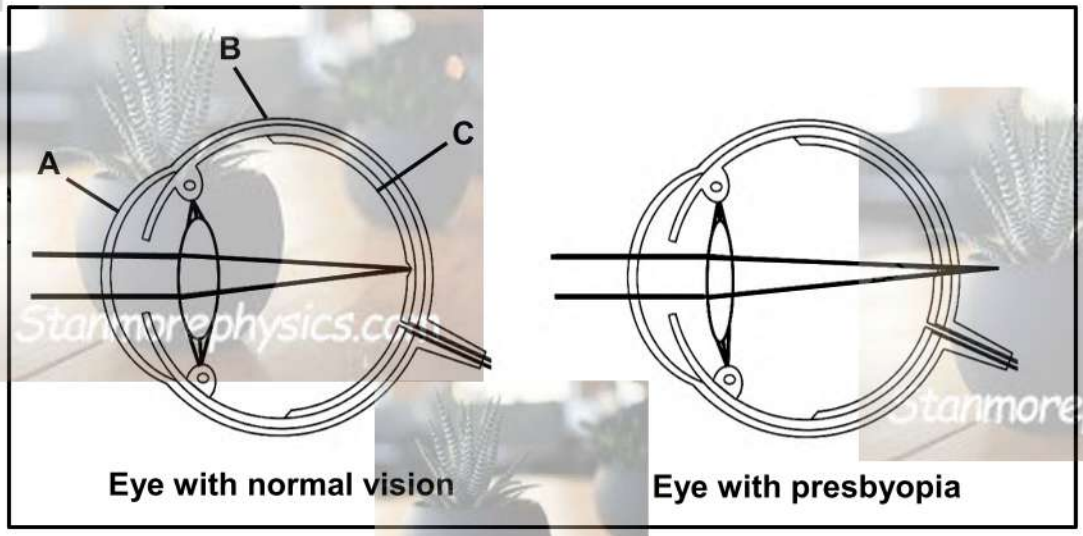
(b) The part of the cells named in QUESTION 3.1.1(a) that are damaged (1)

3.1.2 Describe the relationship between age and the occurrence of MS in men up to the age of 69. (2)

3.1.3 Draw a histogram to represent the results in women aged 40 to 79. (6)
(10)

3.2 After the age of 40, the lens of the eye becomes less flexible and is unable to change its shape. This makes it difficult to focus on nearby objects. This condition is called presbyopia.

The diagrams below show the eye of a person with normal vision and the eye of a person with presbyopia. Both eyes are focussed on an object less than 6 m away.



3.2.1 Identify part:

(a) **A** (1)

(b) **B** (1)

3.2.2 Explain how layer **C** is structurally suited to its function. (2)

3.2.3 From the information, give ONE reason why accommodation becomes more difficult after 40 years of age. (1)

3.2.4 People with presbyopia develop long-sightedness. Reading glasses are prescribed to improve near vision.

(a) Explain why presbyopia leads to long-sightedness. (2)

(b) What type of lenses would be prescribed for a person with long-sightedness? (1)
(8)

3.3 Read the extract below.

HYPOTHYROIDISM IN CHILDREN

Hypothyroidism is a condition where the thyroid gland does not secrete enough thyroxin.

In a study, 265 children with hypothyroidism were checked for other effects and disorders.

The results showed that the most common effects included short stature (33%), loss of appetite (16%), weight gain (14%), tiredness (12%) and goitre (3%). Disorders included a vitamin D deficiency (37%), diabetes mellitus (22,3%) and Down syndrome (8,3%).

3.3.1 State ONE function of thyroxin. (1)

3.3.2 According to the extract, which effect is most common among children with hypothyroidism? (1)

3.3.3 Calculate the number of children in the group that had diabetes mellitus.

Show ALL your working and round off the answer to ONE decimal place. (3)

3.3.4 Apart from testing the thyroxin levels in the blood, explain why doctors may also test the TSH levels in the blood of children with hypothyroidism. (2)
(7)

3.4 Both the nervous and endocrine systems are involved in maintaining homeostasis in the human body.

3.4.1 Which ONE of the two systems is involved in maintaining the:

(a) Carbon dioxide levels (1)

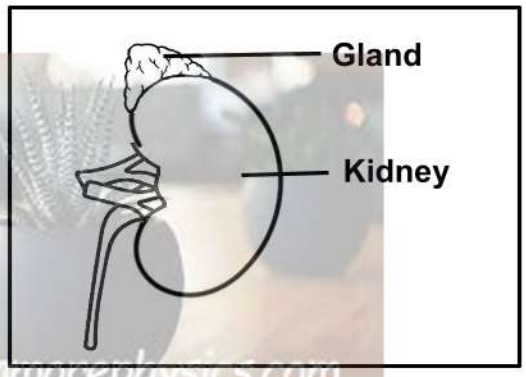
(b) Water levels (1)

3.4.2 While doing strenuous exercise, the water level in a person's blood is low.

(a) Describe how osmoregulation will take place. (5)

(b) Explain TWO reasons why this person needs to breathe faster. (4)
(11)

3.5 The diagram below represents a gland that is located on top of the kidney.



3.5.1 Name the gland shown in the diagram. (1)

3.5.2 Name the hormone secreted by the gland, referred to in QUESTION 3.5.1, that:

(a) Prepares the body for an emergency (1)

(b) Maintains the salt levels in the body (1)

3.5.3 Explain the effect of the hormone, named in QUESTION 3.5.2(a), on the:

(a) Blood vessels transporting blood to the digestive system (2)

(b) Liver (2)
(7)

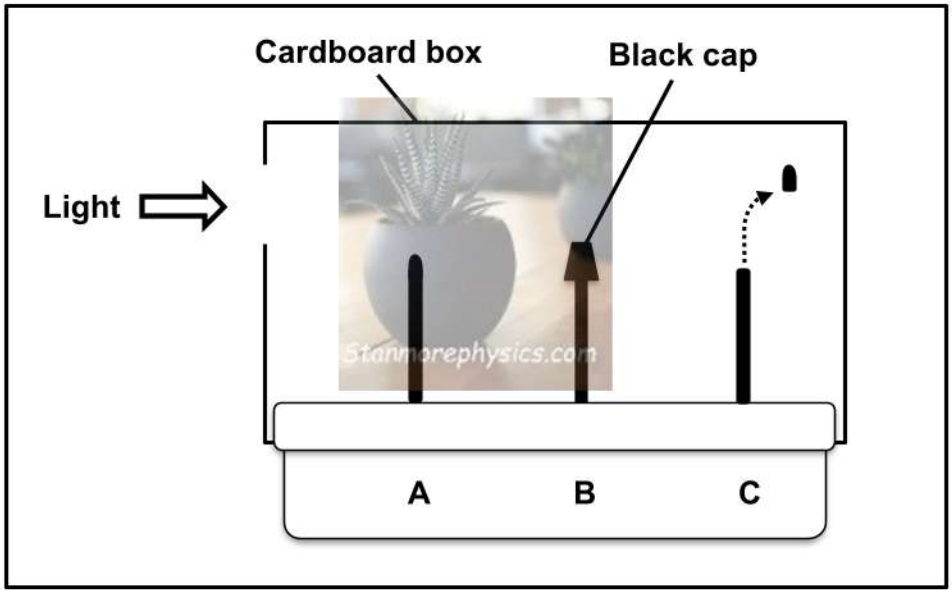
3.6 Scientists conducted an experiment to investigate a growth response in plants.

They used three plants and the stem tip of each plant was treated as follows:

PLANT	TREATMENT
A	The stem tip was left untreated.
B	The stem tip was covered with a black cap.
C	The stem tip was removed.

They placed the plants in a cardboard box with a small opening on one side to allow light through. The plants were left in this cardboard box for five days.

The diagram below represents the experimental set-up at the start of the investigation.



3.6.1 Name the growth response that was investigated. (1)

3.6.2 Name the hormone that causes the growth response referred to in QUESTION 3.6.1. (1)

3.6.3 Explain why the stem tip was removed in plant **C**. (2)

3.6.4 Draw a diagram to show the appearance of ALL THREE stem tips at the end of the investigation. (3)
(7)
[50]

TOTAL SECTION B: 100
GRAND TOTAL: 150