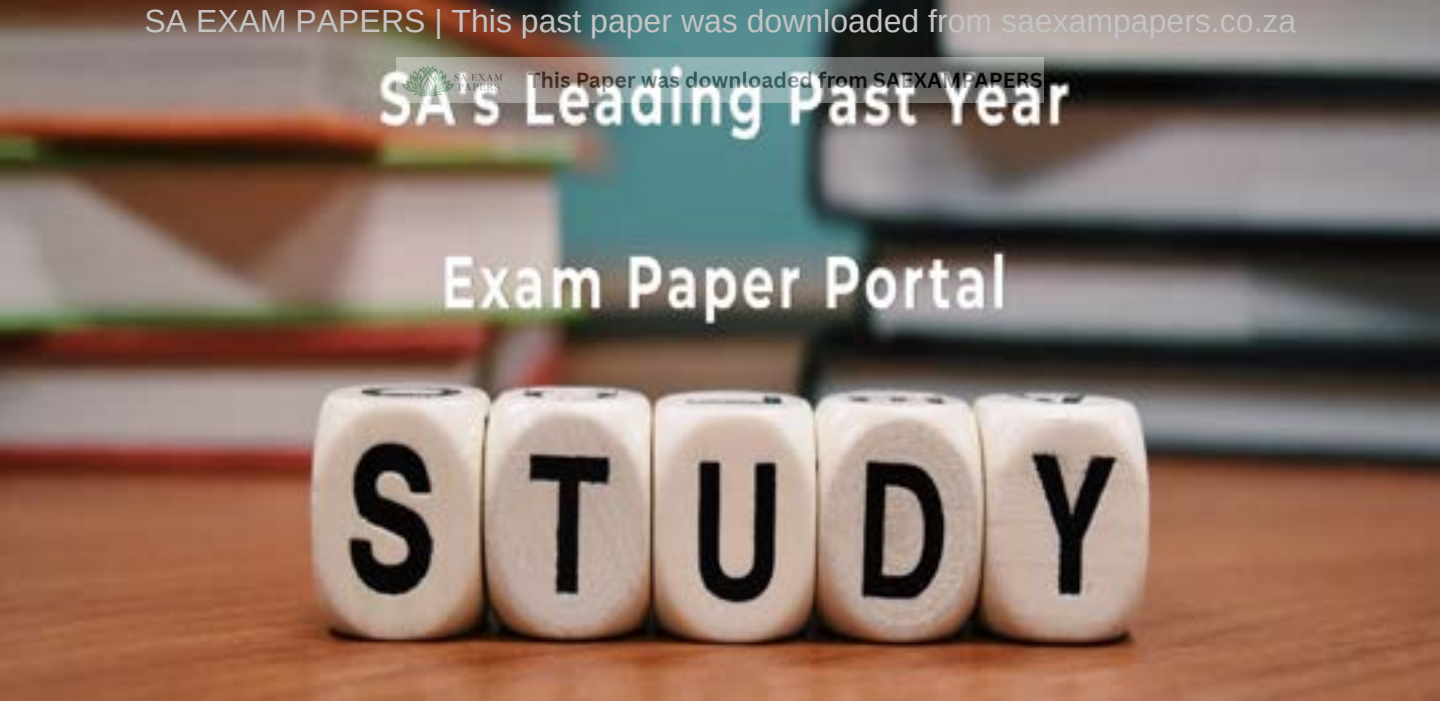


Confidential

basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES P1

NOVEMBER 2025

MARKS: 150

TIME: 2½ hours

This question paper consists of 16 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 1.1.10) in the ANSWER BOOK, e.g. 1.1.11 D.

1.1.1 The hormone that prepares the body for an emergency is …

A aldosterone.
B progesterone.
C adrenalin.
D prolactin.

1.1.2 Which ONE of the following are functions of the placenta?

A Excretion and nutrition
B Gaseous exchange and protection against mechanical injury
C Nutrition and temperature regulation
D Temperature regulation and excretion

1.1.3 The table below shows the reaction time of four learners to a stimulus.

NAME OF LEARNER	REACTION TIME (SECONDS)
Temisha	0,7
Luke	0,6
Anika	0,8
Jordy	0,4

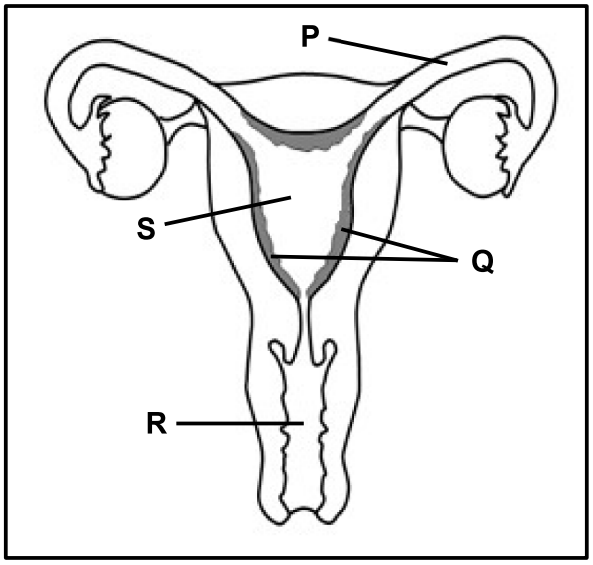
Which ONE of the following learners demonstrates the fastest response to the stimulus?

A Temisha
B Luke
C Anika
D Jordy

1.1.4 A high level of thyroxin in the blood will stimulate the …

A pituitary gland to secrete less TSH.
B thyroid gland to secrete more TSH.
C pituitary gland to secrete more TSH.
D thyroid gland to secrete more thyroxin.

QUESTIONS 1.1.5 AND 1.1.6 ARE BASED ON THE DIAGRAM OF THE FEMALE REPRODUCTIVE SYSTEM.



1.1.5 Which ONE of the following combinations is CORRECT for a normal pregnancy?

	SITE OF FERTILISATION	SITE OF IMPLANTATION
A	**P**	**S**
B	**S**	**Q**
C	**P**	**Q**
D	**R**	**P**

1.1.6 In which part does the zygote develop into a morula?

A **S**
B **Q**
C **R**
D **P**

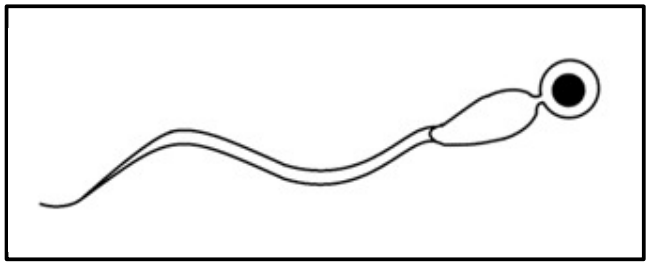
1.1.7 The following is a list of male reproductive parts:

(i) Prostate gland
(ii) Seminal vesicle
(iii) Urethra
(iv) Cowper's gland

Which ONE of the following combinations is responsible for the formation of semen?

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

1.1.8 The diagram below represents a human sperm.



This sperm is NOT structurally suitable for fertilisation because of the …

A absence of a nucleus to provide genetic material.
B absence of an acrosome to improve motility.
C presence of a long tail for the movement of the sperm.
D absence of mitochondria to provide energy.

1.1.9 The following is a list of growth responses in plants:

(i) Plants grow straight upwards
(ii) No upward growth
(iii) Increased number of lateral branches
(iv) Stems bend towards unilateral light

Which ONE of the following combinations describes the growth responses that occur when apical buds of plants are removed?

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

1.1.10 Which ONE of the following is CORRECT for a person who exercises on a hot day without taking in any liquids?

A Increased ADH secretion and increased permeability of renal tubules
B Increased ADH secretion and the production of dilute urine
C Decreased ADH secretion and increased permeability of renal tubules
D Decreased ADH secretion and the production of concentrated urine (10 x 2) **(20)**

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 ovarian hormone that is secreted by the corpus luteum

1.2.2 The eye defect that is characterised by a cloudy lens

1.2.3 The production of ova by meiosis

1.2.4 The part of the retina that contains no rods and cones

1.2.5 The release of an ovum from the ovary

1.2.6 The extra-embryonic membrane that plays a role in the formation of the placenta

1.2.7 A plant hormone responsible for seed dormancy

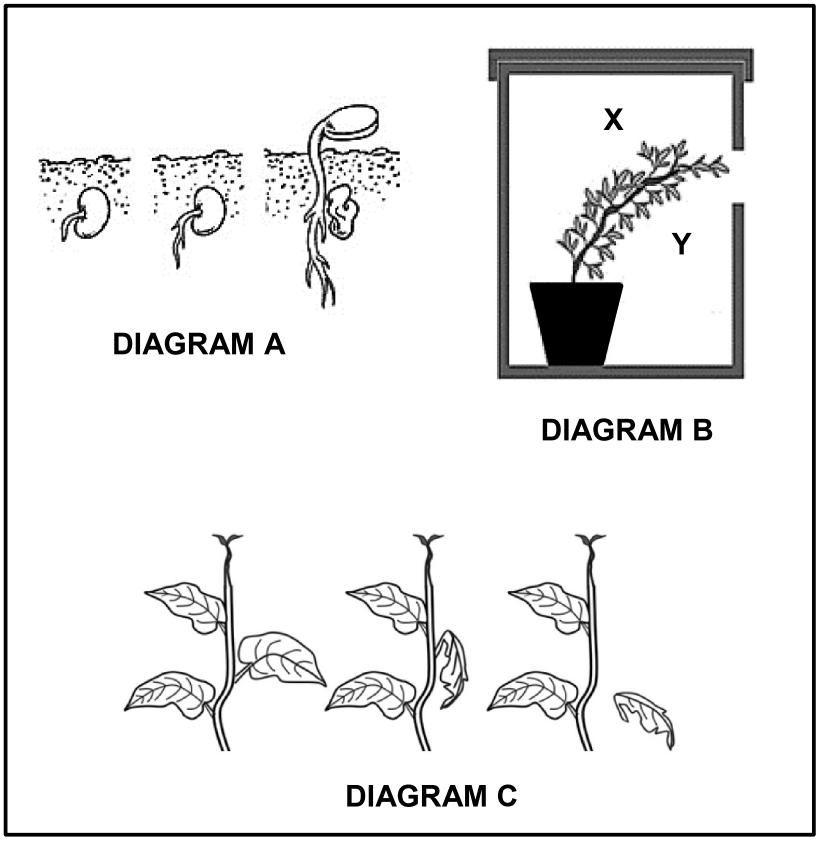
1.2.8 The maintenance of a constant internal environment within narrow limits (8 x 1) **(8)**

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	The hormone responsible for the development of secondary sexual characteristics during puberty	A: Oestrogen B: Testosterone
1.3.2	Plays a role in the pupillary mechanism	A: Ciliary muscles B: Radial muscles
1.3.3	A plant defence mechanism	A: Thorns B: Chemicals

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

1.4 The diagrams below represent different plant responses caused by hormones.



1.4.1 Give the LETTER(S) of the diagram(s) that represent a response due to:

(a) Abscisic acid (1)

(b) Auxins (2)

(c) Gibberellins (1)

1.4.2 Identify the growth response shown:

(a) By the roots in diagram **A** (1)

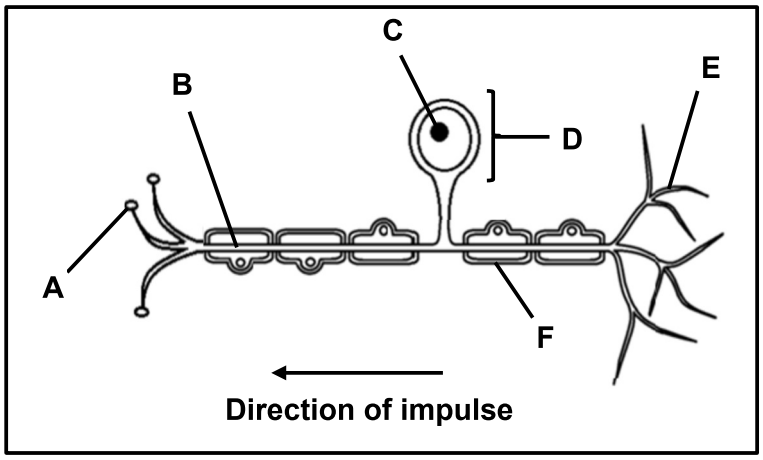
(b) In diagram **B** (1)

1.4.3 Using **X** and **Y** in diagram **B**, state which side of the stem has the highest:

(a) Concentration of auxins (1)

(b) Rate of cell division (1)
(8)

1.5 The diagram below shows the structure of a neuron.



1.5.1 Name the type of neuron represented by the diagram. (1)

1.5.2 Identify part:

(a) **B** (1)

(b) **D** (1)

(c) **E** (1)

1.5.3 Give the LETTER of the part that:

(a) Contains the genetic material of the neuron (1)

(b) Insulates the neuron (1)

(c) Makes synaptic contact with an interneuron (1)

1.5.4 Name the disorder that is associated with the degeneration of part **F**. (1)
(8)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 In bird eggs, the yolk is the main source of energy for the developing embryo.

The table below provides information about the eggs of some bird types.

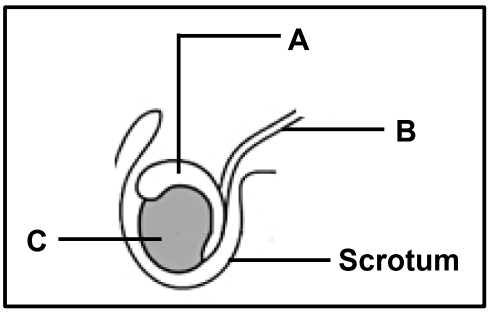
TYPE OF BIRD	AVERAGE % OF YOLK IN THE EGG
Goose	35,1
Eagle	12,0
Duck	35,4
Vulture	14,0
Chicken	31,9
Pigeon	17,9

2.1.1 Explain why we may conclude that ducks display precocial development. (3)

2.1.2 Name the THREE bird types that would have a higher degree of parental care. (3)

2.1.3 Give a reason for your answer to QUESTION 2.1.2. (2)
(8)

2.2 The diagram below shows a part of the male reproductive system.



2.2.1 Give the LETTER and the NAME of the:

(a) Gland that secretes testosterone (2)

(b) Part that stores sperm until maturation (2)

2.2.2 Explain the role of the scrotum in sperm production. (2)

2.2.3 Name and describe the process of sperm production. (5)
(11)

2.3 The thickness of the endometrium varies throughout the menstrual cycle of a female.

The table below shows the results recorded for a woman who had her endometrial thickness monitored for a particular menstrual cycle.

DAY OF THE MENSTRUAL CYCLE	THICKNESS OF THE ENDOMETRIUM (mm)
0	14
7	3
14	5
21	13
28	16

2.3.1 Referring to ovarian hormones, explain the:

(a) Decrease in thickness of the endometrium from day 0 to day 7 (3)

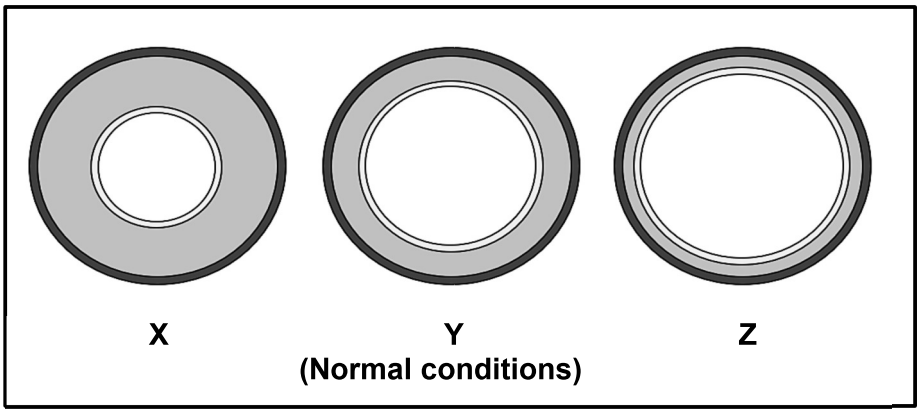
(b) Increase in thickness of the endometrium from day 7 to day 14 (2)

2.3.2 Describe changes in the endometrium that cause it to become thicker. (2)

2.3.3 State the significance of the change in endometrium thickness described in QUESTION 2.3.2. (1)

2.3.4 Draw a bar graph to show the results in the table. (6)
(14)

2.4 The diagrams below represent the differences in the diameter of an arteriole (small artery) close to the surface of the skin. These differences are due to changes that occur during thermoregulation under different environmental conditions. Diagram **Y** shows the arteriole under normal conditions.



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

2.4.2 Give the LETTER of the diagram which represents the arteriole on a cold day. (1)

2.4.3 Explain the significance of the change in the diameter of the arteriole from normal conditions to the condition in diagram **Z**. (4)
(6)

2.5 Idiopathic Short Stature (ISS) describes a condition where children have normal birth height, but grow slowly and do not reach the expected height for their age group. This condition is NOT due to malnutrition or different lifestyles.

Scientists investigated the effect of added growth hormone on the height of children with ISS.

The procedure was as follows:

- Consent was obtained from the parents of a group of two-year-old boys with ISS.
- The boys were divided into two groups.
- The participants in Group **A** received human growth hormone at a daily dosage of 0,028 mg per kg of body weight.
- The participants in Group **B** did not receive the hormone treatment.
- The height of the participants was measured and recorded monthly until each participant reached the age of 18 years.

At 18 years of age, the average height in Group **A** was 8 cm more than that in Group **B**.

2.5.1 State the dependent variable of this investigation. (1)

2.5.2 List THREE variables that were kept constant and which contributed to the validity of the investigation. (3)

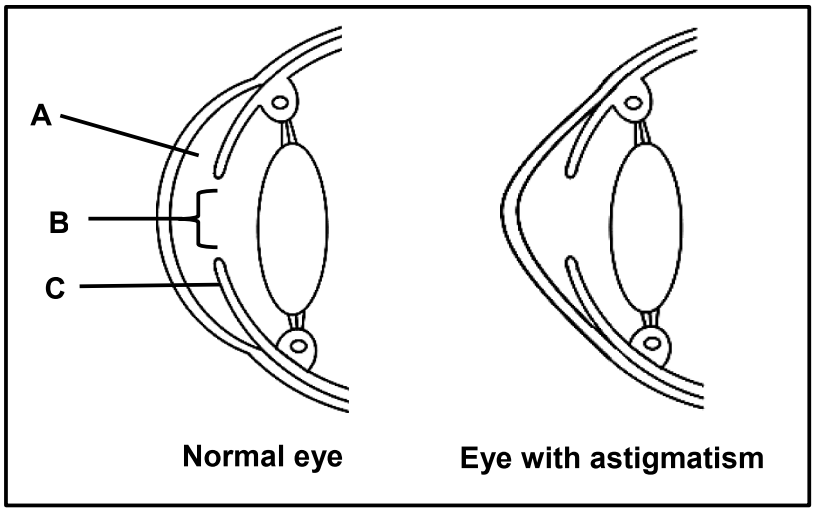
2.5.3 Explain the purpose of Group **B** in this investigation. (2)

2.5.4 Calculate the daily amount of added human growth hormone that was given to a boy with a mass of 25 kg. Show ALL your working, INCLUDING the correct unit. (3)

2.5.5 Give a conclusion for this investigation. (2)
(11)
[50]

QUESTION 3

3.1 The diagrams below represent the structure of a normal eye and that of an eye with astigmatism.



3.1.1 Identify:

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

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

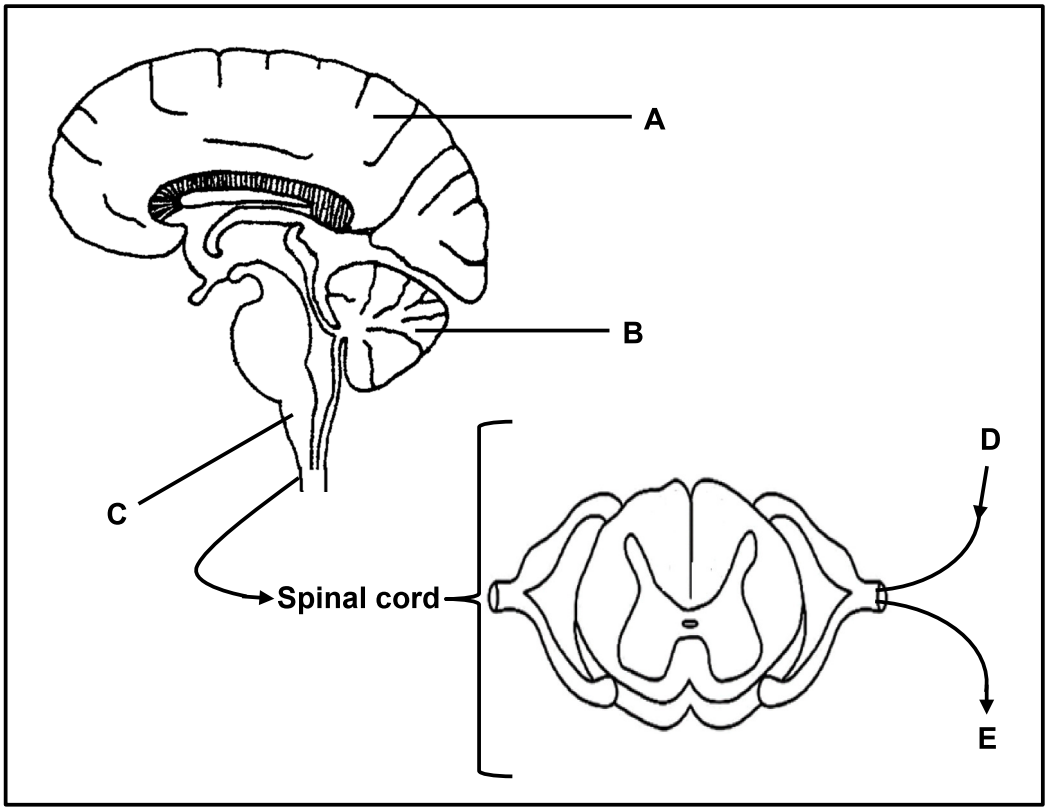
(c) Part **C** (1)

3.1.2 Describe the appearance of the cornea of an eye with astigmatism. (1)

3.1.3 Explain how astigmatism affects vision. (3)

3.1.4 Give ONE treatment for astigmatism. (1)
(8)

3.2 The diagrams below show parts of the human nervous system.



3.2.1 Name the branch of the nervous system represented by the parts shown. (1)

3.2.2 Give the LETTER and NAME of the part responsible for:

(a) Balance and coordination (2)

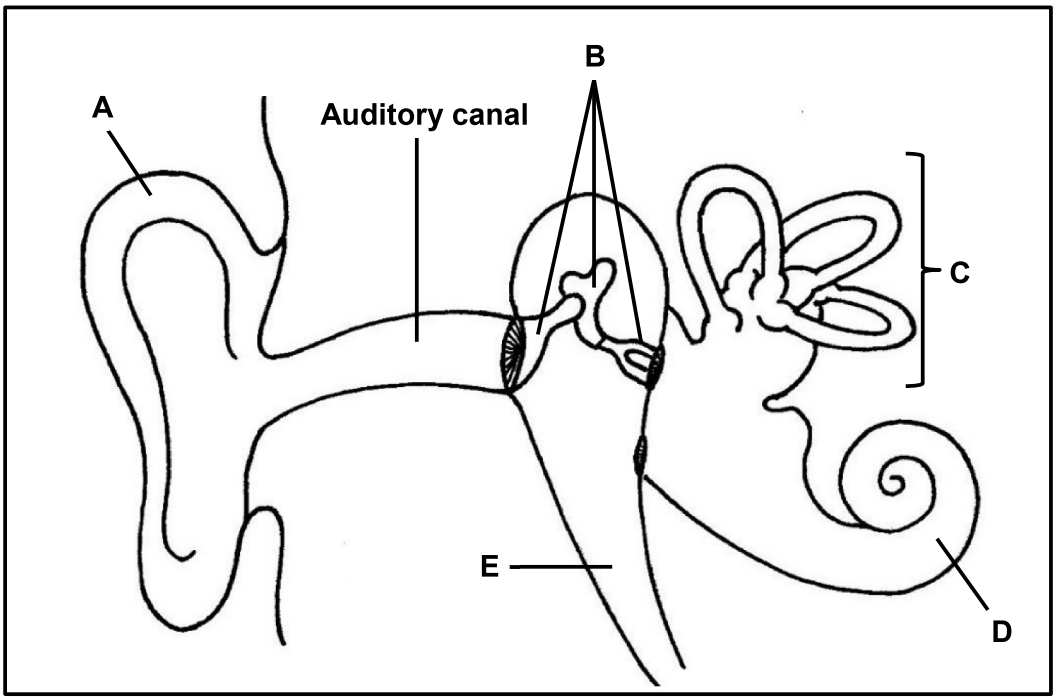
(b) Control of breathing (2)

(c) Control of skeletal muscles (2)

3.2.3 Describe the pathway of an impulse from part **D** through the spinal cord to part **E**, to bring about a reflex action. (6)
(13)

3.3 Describe how the human eye ACCOMMODATES for distant vision. **(5)**

3.4 The diagram below shows the structure of the human ear.



3.4.1 Identify part:

(a) **A** (1)

(b) **B** (1)

3.4.2 Give the LETTERS of TWO parts that are normally filled with fluid. (2)

3.4.3 Describe how balance is restored when there is a change in the speed and direction of head movement. (5)

3.4.4 When a person is exposed to loud noise over a long period, it may lead to noise-induced hearing loss (NIHL), which is caused by damage to the hair cells in the organ of Corti. These cells are not repaired when damaged. Placing earplugs in the auditory canal can prevent damage to the hair cells.

Explain how:

(a) Damage to the hair cells in the organ of Corti can lead to hearing loss (2)

(b) Earplugs can prevent damage to the hair cells in the organ of Corti (3)
(14)

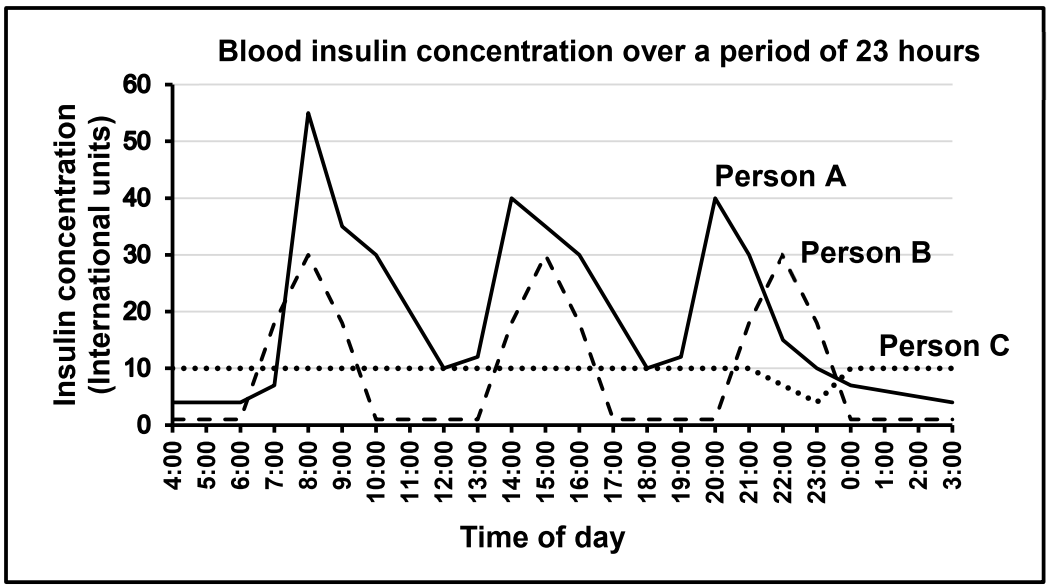
3.5 The graph below shows the insulin levels of three people over a 23-hour period, who were treated as follows:

Person A: A healthy person who received no treatment

Person B: A person with diabetes mellitus who received a rapid-acting insulin injection before each meal

Person C: A person with diabetes mellitus who received a daily injection, containing long-acting insulin, at 23:00

All three people received the same meals at the same time of the day.



3.5.1 Name the organ that secretes insulin. (1)

3.5.2 State the number of meals that were eaten during the 23-hour period. (1)

3.5.3 Tabulate TWO differences between long-acting insulin treatment and rapid-acting insulin treatment over the 23-hour period. (5)

3.5.4 Name the type of insulin treatment that is similar to insulin secretion in a healthy person. (1)

3.5.5 Explain why person **B** may experience a lack of energy after receiving a rapid-acting insulin injection if NO meal is taken. (2)
(10)
[50]

TOTAL SECTION B: 100
GRAND TOTAL: 150