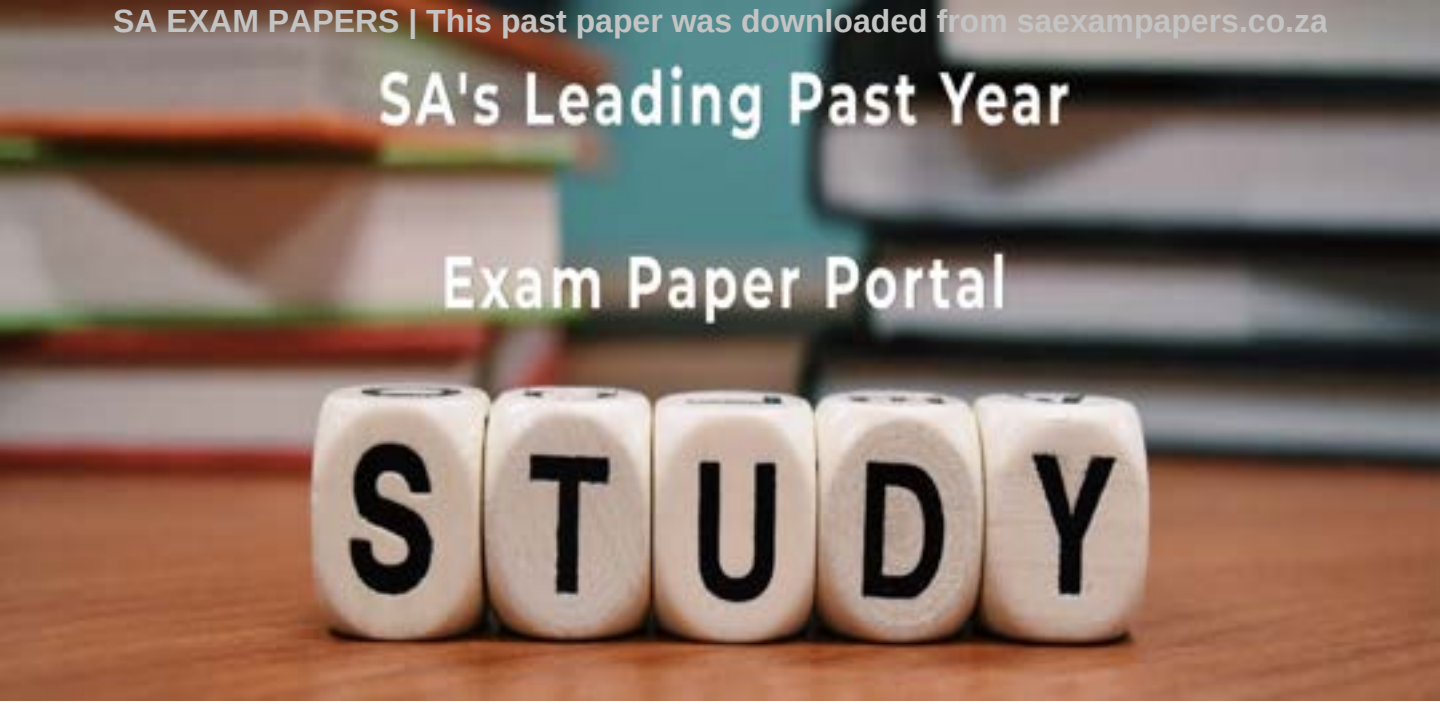

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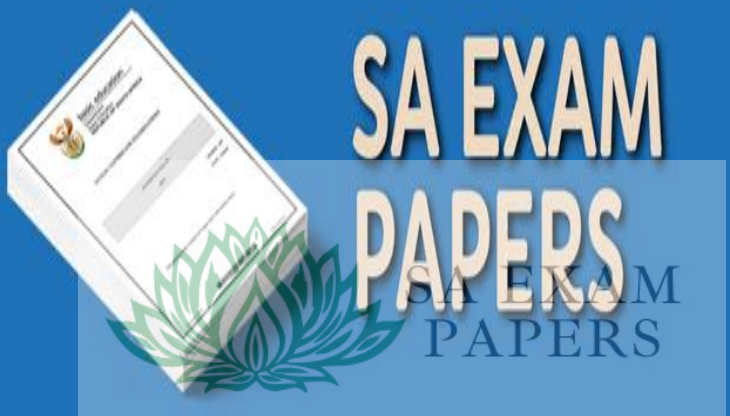


education
Department of Education
FREE STATE PROVINCE

THABO MOFUTSANYANA EDUCATION DISTRICT

GRADE 12

LIFE SCIENCES

MOCK EXAM (PAPER 1 & 2 CONTENT)

AUGUST 2024 TRIAL

MARKS: 120

TIME: 1 ½ hrs

This question paper consists of 11 **pages.**

QUESTION 1

1.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A to D) next to the question number (1.1.1 tot 1.1.5) in the ANSWER BOOK, for example 1.1.8 A

1.1. A light stimulus is converted into a nerve impulse in the ... of the human eye.
1

A Lens
B Cornea
C Utriculus
D Retina

1.1. Cristae are found in the …
2

A cochlea
B ampula
C sacculus
D utriculus

1.1. What would be a possible consequence for the foetus if the placenta produces insufficient levels of progesterone?
3

A The foetus will not grow because there will be no cell division.
B The foetus may be underdeveloped due to a shortage of growth hormone.
C A miscarriage might occur because the endometrium will disintegrate.
D The foetus could be injured because there will be no shock absorption.

1.1. Which ONE of the following is a reproductive isolation mechanism?
4

A Breeding at the same time of the year
B Adaptation of the same pollinators
C Prevention of fertilisation
D Sharing the same habitat

1.1. The study of the inheritance of mutations in mitochondrial DNA is an example of …
5

A Fossil evidence
B Genetic evidence
C Modification by descent

D Cultural evidence

5 X 2 **(10)**

1.2 **Give the correct BIOLOGICAL TERM for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.5) in the ANSWER BOOK**.

1.2.1 A genetic cross involving one gene and its alleles.
1.2.2 The formation of the species
1.2.3 Evolution characterized by long periods on no change alternating with short periods of rapid change.
1.3.4 The component of the autonomic nervous system that decreases the heartbeat back to normal.
1.2.5 Nerve fibres that conduct nerve impulses to the cell body.

(5)

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 number
(1.3.1 to 1.3.3) in the ANSWER BOOK

	Column A	**Column B**
1.3.1	Fossils found in South Africa	A: Little Foot B: Taung Child
1.3.2	Proposed the 'law' of use and disuse	A: Eldredge B: Gould
1.3.3	A component of the peripheral nervous system	A: Cranial nerves B: Spinal cord

Total section A: (21)

QUESTION 2

2.1 In summer squash plants, white fruit colour **(B)** is dominat over yellow fruit colour **(b)**, and round fruit **(D)** is dominant over fruit **(d)**
A summer squash plant that is **homozygous** for white and round fruit is crossed with a plant that is homozygous for yellow and oval fruit.

2.1.1 State the:
(a) Genotype of P 1- parents (2)
(b) Phenotypes of the F1- generation (2)

(4)

2.2 Describe how speciation occurs through geographic isolation **(5)**

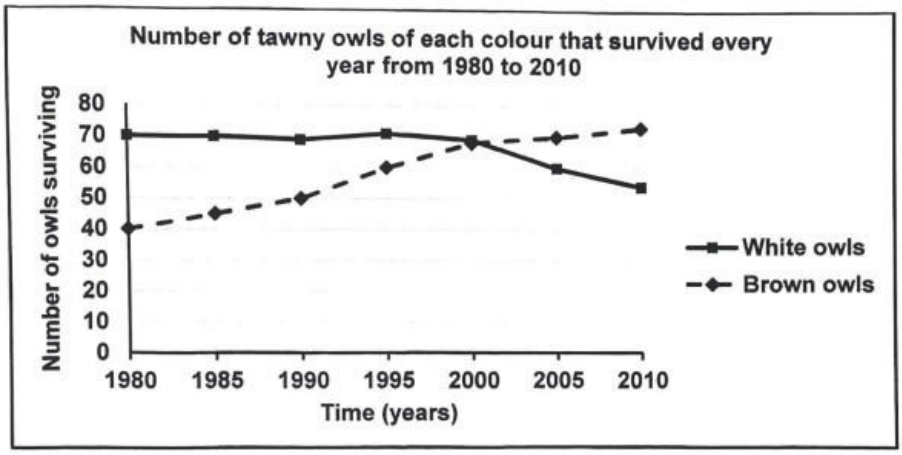
2.3 There is a variation in tawny owls. Some are white and others are brown in colour. Scientists studied these owls over a period of 30 years, from 1980 to 2010, to

determine the effect of climate change on the survival of the owls. During this time, climate change caused increasing global temperatures with less snow falling each year.

The scientists:

- Conducted the investigation over the same four months of winter each year
- Observed the same population of tawny owls each year
- Determined the number of tawny owls of each colour that survived every year.

The results are shown in the graph below:



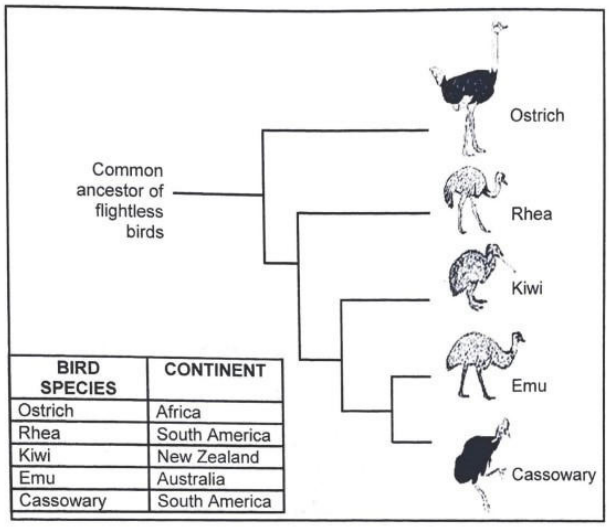
2.3.1 Identify the dependent variable in this investigation. (1)

2.3.2 Explain the results obtained from 2000 to 2010 for the white owls. (3)

2.3.3 Name one variable that was kept the same. (1)

(5)

2.4 The diagram below represents the evolution of the flightless birds and the continents on which they exists at present.



BIRD SPECIES	CONTINENT
Ostrich	Africa
Rhea	South America
Kiwi	New Zealand
Emu	Australia
Cassowary	South America

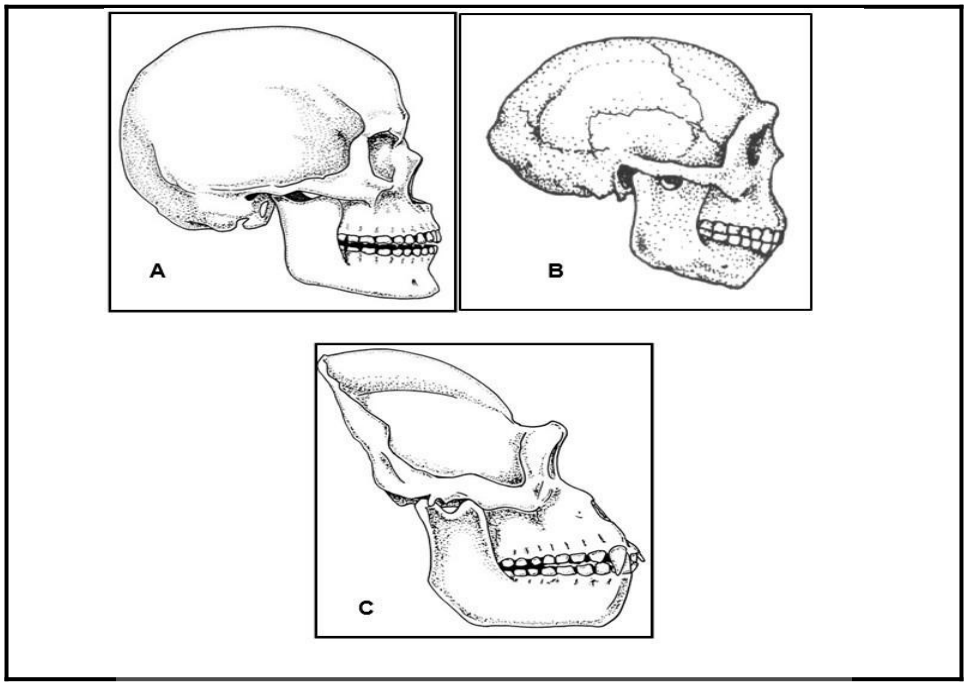
2.4.1 Name the TWO of species that share the most recent common ancestor. (2)

2.4.2 Use information in the diagram to describe how biogeography supports the theory of evolution. (4)

2.4.3 Identify the type of diagram shown above. (1)

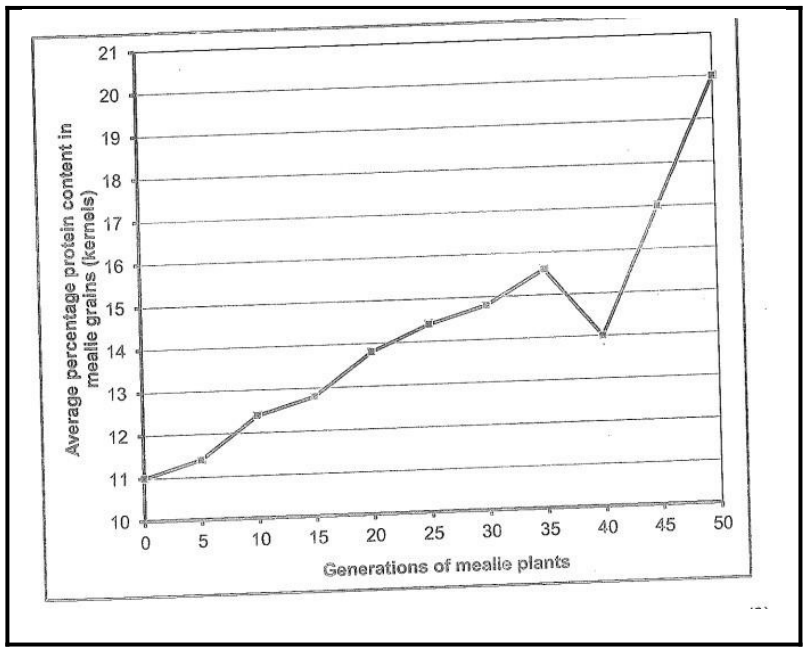
(7)

2.5 The diagrams below show the skulls of three primate genera. The diagrams are NOT drawn to scale.



2.5.1	Give the letter of a skull that has the largest brain size.	(1)
2.5.2	State one advantage of having a large brain	(1)
2.5.3	What are any THREE features of skull **B** shown in the diagram above that allows scientists to determine that this was a much earlier species of genus Homo than modern humans. (H. sapiens)	(3)
2.5.4	Name TWO lines of evidence that support the idea that humans originated on the African continent.	(2)
		(7)

Question **2.5.5** to **2.5.8** is based on the graph below showing the results of artificial selection for protein content in mealie plants over 50 generations.



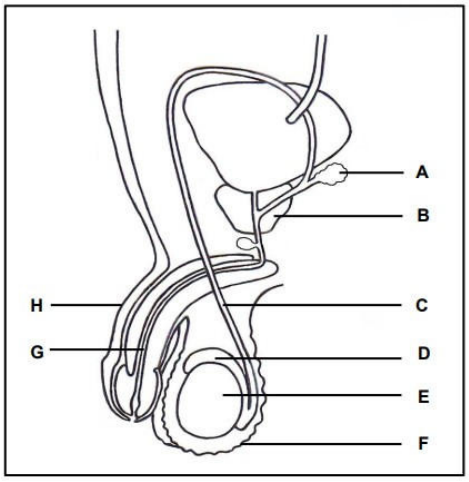
2.5.5	Describe how the artificial selection of the mealie plant was done	(3)
2.5.6	What was the average percentage of the protein content in the mealie grains (kernel) at 15th generation?	(1)
2.5.7	By how many times did the average percentage of the protein content in the mealie grains (kernels) increase between the 40th and 50th generation? Show all the workings.	(2)
2.5.8	Describe **ONE** way which the process of artificial selection is different from genetic engineering.	(2)
		(8)

2.6 Describe Darwinism by natural selection **(7)**

Total question 2 : 43

QUESTION 3

3.1 The diagram shows the parts of the male reproductive system



3.1. Identify part:

1 **(a)** **C** (1)

(b) **F** (1)

(c) **H** (1)

3.1. Give the LETTER and Name of the part that:

2

(a) Stores sperm temporarily (2)

(b) Transports both semen and urine (2)

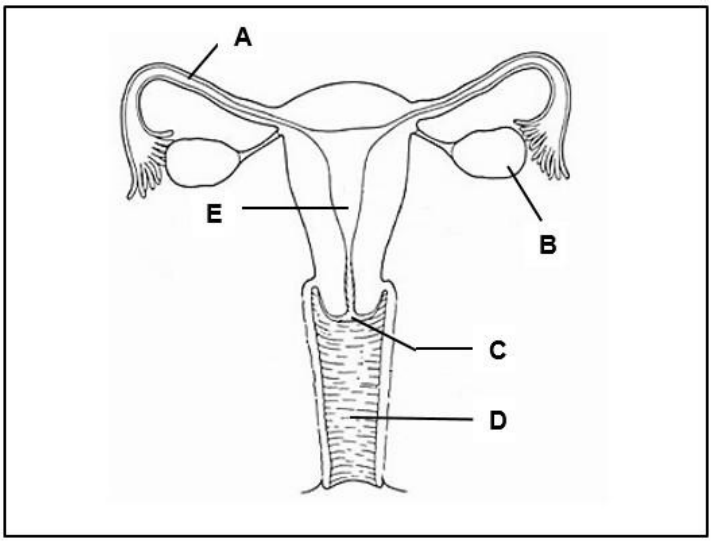
(C) Produces testosterone (2)

3.1. Give the LETTERS of TWO parts that contribute to the formation of semen (2)

3

(11)

3.2 The diagram below shows the female reproductive system.



3.2. Identify part:

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

(b) **C** (1)

3.2. Give the LETTER of the part, where each of the following takes place:

2 (a) Meiosis (1)

(b) Fertilization (1)

3.2. State TWO functions of part **E** (2)

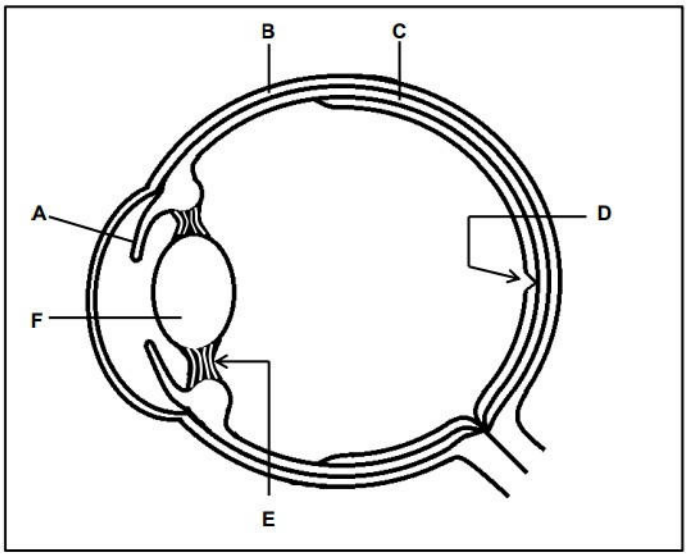
3

3.2. Name the glands which secrete nutrient rich fluid for the sperm, to reach part **A** (1)

4

(7)

3.3 The diagram below represents the structure of the human eye.



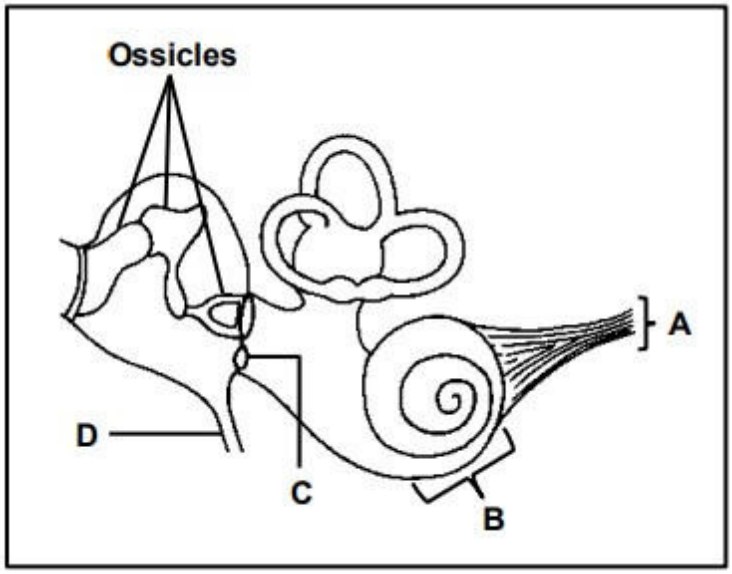
3.3.1 Explain ONE way in which **part B** is structurally different from **part F** (4)

3.3.2 Describe how the muscles in part A function, to increase the amount of light entering the eye. (3)

3.3.3 Describe how a blurred image forms if a person with normal vision wears spectacles with biconvex lenses while reading a book. (3)

(10)

3.4 The diagram below represents a part of the ear.



3.4. Identify part:

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

(b) **B** (1)

3.4. State the function of part:

2 (a) **C** (1)

(b) **D** (1)

3.4. Otosclerosis is a medical condition that prevents the ossicles from vibrating.

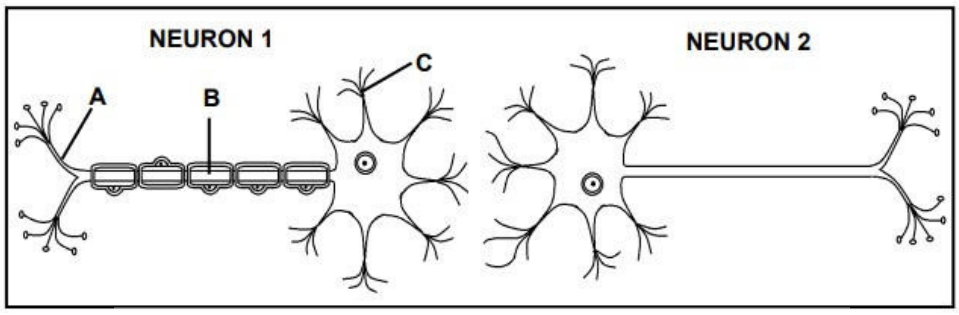
3 Explain how this condition will affect hearing. (4)

3.4. Describe the role of the ear in maintaining balance. (6)

4

(14)

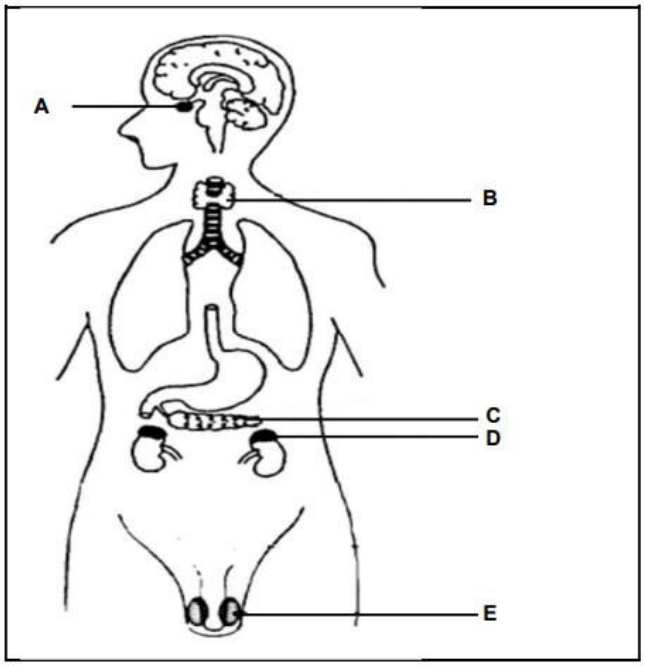
3.5 The diagram below represents a type of neuron found in the human body.



3.5.1 Identify the type of neuron above (1)

3.5.2 Explain how the speed of transmission of impulses will differ for **neuron 1** and **neuron 2** (3)

Questions **3.5.3** to **3.5.4** are based on the diagram below that shows the position of the endocrine glands found in a male human body.



3.5.3 Identify the NAME and LETTER of the gland that secrete a hormone that: (2)
Regulate salt balance

3.5.4 Explain the consequences to the weight of a person if the hormone secreted by gland B remain abnormally high for extended periods of time. (3)
(9)

3.6 Read the passage below and answer the questions that follow.

Bald Eagle

During the breeding season, the Bald Eagle prefer pine trees to build their nest high up in the trees.

Courtship displays, performed by the bald eagles, are impressive and spectacular. The female usually lays 2 eggs. Both the male and the female take part in the development of the eggs for 34-36 days. After the chicks are hatched, one of the parents is constantly with them for about 2 weeks. Then, at the age of 10-12 weeks, the chicks start flying but the parents keep on feeding and protecting them for another 2-3 months.

The Bald eagle's existence is threatened by the drainage of wetlands by humans, illegal shooting and pesticides contain a serious threat of poisoning: DDT, for example, can cause thinning of eggshells and reproductive failure.

3.6.1 Name the type of fertilisation that takes place in the Bald eagles. (1)

3.6.2 Name FOUR possible reasons why the Bold eagle's development can be described as altricial. (4)

(5)

Total section B: 99

GRAND TOTAL: 120