This memorandum consists of 9 pages.
SECTION A

QUESTION 1

1.1  1.1.1 A √ √
     1.1.2 A √ √
     1.1.3 B √ √
     1.1.4 C √ √
     1.1.5 A √ √
     1.1.6 A √ √
     1.1.7 C √ √
     1.1.8 D √ √
     1.1.9 D √ √

1.2  1.2.1 Endometrium √
     1.2.2 Herbivore √
     1.2.3 Predator √
     1.2.4 Fertilisation √
     1.2.5 Symbiosis √
     1.2.6 Population √
     1.2.7 Census/Counting √
     1.2.8 Decomposers √
     1.2.9 Interspecific competition √

(9 x 2)  (18)
(9 x 1)  (9)
1.3 1.3.1 Both A and B
1.3.2 Both A and B
1.3.3 A only
1.3.4 None
1.3.5 Both A and B
1.3.6 A only
1.3.7 B only
1.3.8 B only (8 x 2) (16)

1.4 1.4.1 B
1.4.2 D
1.4.3 B
1.4.4 Primary succession (in this sequence) (4)

TOTAL SECTION A: 50
SECTION B

QUESTION 2

2.1 2.1.1 (a) 3 √ (1)
(b) 2 √ (1)

2.1.2 - Amniotic fluid √ (1)

2.1.3 - Act as a shock absorber √/ protect foetus against injury
- Maintain constant body temperature√
- Medium for free movement of foetus. √
- Prevents dehydration of the foetus. √
(Mark first TWO answers only) (2)

2.1.4 Placenta. √ / chorion villi (1)

2.1.5 - Provides nourishment for the embryo √
- Supplies oxygen/ removes carbon dioxide √
- For attaching the embryo to the mother √
- Allow for diffusion of nitrogenous excretory wastes from the foetus to the mother. √
- secretes its own progesterone after ±12 weeks to maintain pregnancy √
(Mark first TWO answers only.) (2)

2.1.6 - umbilical cord √ (1)

2.2 2.2.1 A – Hypophysis / Pituitary gland √
B – Thyroid gland √
C – Pancreas √ (3)

2.2.2 (a) B √ (2)
(b) A √

2.2.3 - The pituitary gland (A) secretes the hormone TSH √ which
- stimulates the thyroid gland (B) to secrete thyroxin. √
- an increase in thyroxin in the blood inhibits the pituitary (A)
- which secretes less TSH. √
- this cause the thyroid gland to secrete less thyroxin. √
- which in turn reduce the inhibitory effect on the pituitary gland √
- which will then increase the amount of TSH that it secretes. √
(Any 4 x 1) (4)
2.3 2.3.1 A – Semi-Circular Canals. √
B – Ampulla √
C – Utriculus √
D – Sacculus √
E – Cochlea √
F – Auditory nerve √

2.3.2 (a) head movement √/ nodding / speed and direction of head movement
(b) changes in the body position √/ gravity
(c) sound waves √

2.3.3 - by the bony labyrinth. √

2.3.4 (a) cerebellum √
(b) cerebrum √
QUESTION 3

3.1 3.1.1  This visual courtship display in peacocks is a way that the males attract a mate √ of the same species as a prelude to mating √ (Any 2 x 1) (2)

3.1.2  The embryo within the egg is protected √ from drying out by a shell, √ is nourished by the yolk √ and albumin and is able to develop successfully √ on land.  (Any 2 x 1) (2)

3.1.3  Many eggs are eaten by predators √ or washed away √ by the currents and never are fertilised. So thousands off eggs are laid to ensure that some will be fertilised √ and developed into codfish. (Any 2 x 1) (2)

3.1.4  Release of sperm and eggs is synchronised √ which increase the probability that external √ fertilisation of the eggs will occur since the gametes are released in the same places √ at the same time. (Any 2 x 1) (2)

3.1.5  Providing parental care increases the probability √ that the offspring will survive until they are independent √ and fully mature to produce their own offspring. √ (Any 2 x 1) (2)

3.2 3.2.1  The estimated population size of Species A and B over eight weeks

![Graph showing estimated population size of Species A and B over eight weeks](image-url)
Guideline for the assessing of the graph

<table>
<thead>
<tr>
<th>Correct type of graph and the joining of points</th>
<th>1</th>
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<tbody>
<tr>
<td>Title of graph</td>
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<tr>
<td>Correct label and scale x-axes</td>
<td>1</td>
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<tr>
<td>Correct label and scale y-axes</td>
<td>1</td>
</tr>
<tr>
<td>Key/ labelling of species A and B</td>
<td>1</td>
</tr>
<tr>
<td>Plotting of points</td>
<td>1: 1 to 6 points plotted correctly</td>
</tr>
<tr>
<td></td>
<td>2: 7 to 12 points plotted correctly</td>
</tr>
<tr>
<td></td>
<td>3: 13 to 15 points plotted correctly</td>
</tr>
<tr>
<td></td>
<td>4: all 16 points plotted correctly</td>
</tr>
</tbody>
</table>

(9)

NOTE:
If the wrong type of graph is drawn, 5 marks will be lost for:
- ‘Correct type of graph and joining of points’
- ‘Plotting of points’
If labels of the axes are transpose then 2 marks will be lost for:
- * ‘Correct label and scale for X and Y axes’

3.2.2 As the numbers of Species B increases the number of Species A decrease because they (Species A) are the food for Species B √ / In week 1 the numbers of Species A increase more than Species B because they had enough food √ / If Species B would have been the prey, their numbers in week two would have been less because than there would have been more predators (species A) in week 1. √
(Any 1 x 1) (1)

3.2.3 Both would die, √ because the food for Species A would be finished and species A will die leaving Species B without food and they will also die. √
(2)

3.2.4 Species A numbers will increase √ because there will be no predators to kill them. √
(2)

3.3 3.3.1 - The natural resources vary/
- Changing ecosystems
- Building of new houses, etc.
- Population growth
- Increase in waste √
(Any 1 x 1) (1)

3.3.2 - Since 1961 – 1975 the ecological footprint is higher than the biocapacity. √
- After that (1976) the ecological footprint drop below the biocapacity /biocapacity increase above the ecological footprint. √
- During the 1980’s and 1990’s the ecological footprint remained more or less constant. √
- and even dropped slightly in the late 90’s early 2000’s √
(Any 3 x 1) (3)
3.3.3 - Those countries having higher ecological footprints than their biocapacity will acquire resources from neighbouring countries, thus increasing competition for the resources lead to unrest/war (1)

3.3.4 - 12/13 years (1)

**TOTAL SECTION B: 60**

**SECTION C**

**QUESTION 4**

4.1 4.1.1 Extinct – species that no longer exists last individual of the species have died.

Endemic – Organisms which are only found in a restricted area part of a country. (2)

4.1.2 - Alien trees were removed from the area. (1)

4.1.3 - If endemic species go extinct, they are lost forever as they do not occur anywhere else in the world. (Any 1 x 1) (1)

4.2 4.2.1 - James's hearing is better/not/same/different than Sandra's

- James's hearing of lower frequencies is higher/lower/the same/different than that of Sandra's

- Sandra's hearing of higher frequencies is higher/lower/the same/different than that of James. (Any 2 x 1) (2)

4.2.2 - James can hear things, that Sandra cannot hear. (2)

4.2.3 - 19 Hz (1)

4.2.4 James. He has a range of 19 to 20 300 = 20 281 Hz whereas Sandra, has a range of 18 to 20 100 = 20 082 Hz (3)

4.2.5 Independent – James and Sandra/person

Dependent – Lowest and highest frequency of sound (2)

4.2.6 No, the sound that they(bats) produce have a much higher frequency than the range that James can hear. (3)

4.2.7 - hammer/maleus, anvil/incus and stirrup/stapes (3)
4.3
- When it is hot √
- Heat receptors √
- in the skin √
- and receptors in the hypothalamus √
- are stimulated by the high temperature √
- The stimulus in the skin is converted into an impulse √
- and transmitted to the hypothalamus √
- which acts as the heat regulating centre of the body √
- Impulses are sent from √ the hypothalamus
- to the sweat glands √
- and erector muscles √
- More sweat is produced √
- and more heat is lost √
- by evaporation of sweat √
- The erector muscles relax √
- causing the hair √
- to lie flat on the skin √
- trapping very little air between the hair √
- Insulation is thus reduced √
- Dilated blood vessels allow more blood to the skin √
- and more heat is thus lost from the body √
- by radiation/ conduction / convection √
- thus lowering the body temperature to normal √

(Any) (17)

ASSESSING THE PRESENTATION OF THE ESSAY

<table>
<thead>
<tr>
<th>Marks</th>
<th>Descriptions</th>
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<tbody>
<tr>
<td>3</td>
<td>Well structured – demonstrates insight and understanding of question</td>
</tr>
<tr>
<td>2</td>
<td>Minor gaps in the answer</td>
</tr>
<tr>
<td>1</td>
<td>Attempted but with significant gaps in the answer</td>
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<tr>
<td>0</td>
<td>Not attempted/nothing written other than question number</td>
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Synthesis (3)

TOTAL SECTION C: 40

GRAND TOTAL: 150