**ADDITIONS TO MEMORANDUM AFTER MEMO DISCUSSION PAPER 1 SEPTEMBER 2017**

**ADDITIONS ARE INDICATED IN RED**

|  |
| --- |
| section aQUESTION 1 |

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| 1.1 |  |  |

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| --- | --- | --- |
| 1.1.1 | C 🗸🗸 |  |
| 1.1.2 | D 🗸🗸 |  |
| 1.1.3 | B 🗸🗸 |  |
| 1.1.4 | C 🗸🗸 |  |
| 1.1.5 | B 🗸🗸 |  |
| 1.1.6 | A🗸🗸 |  |
| 1.1.7 | A 🗸🗸 |  |
|  | (7x2) | **(14)** |

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| --- | --- | --- |
| 1.2 |  |  |
| 1.2.1 | Gibberellins🗸 |  |
| 1.2.2 | Fallopian tube/ oviduct🗸 |  |
| 1.2.3 | Gestation🗸 |  |
| 1.2.4 | Umbilical chord🗸 |  |
| 1.2.5 | Epididymis🗸 |  |
| 1.2.6 | ADH🗸 |  |
| 1.2.7 | Aldosterone🗸 |  |
| 1.2.8 | Embryo🗸 |  |
| 1.2.9 | Implantation🗸 |  |
|  | (9x1) | **(9)** |
| 1.3 |  |  |
| 1.3.1 | A only 🗸🗸 |  |
| 1.3.2 | B only 🗸🗸 |  |
| 1.3.3 | A only 🗸🗸 |  |
| 1.3.4 | Both A and B🗸🗸 |  |
|  | (4x2) | **(8)** |

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| 1.4 | 1.4.1 | (a) F🗸(b) A🗸 | (1)(1) |
|  |  |  |  |
|  | 1.4.2 | (a) Plays a role in informing the cerebellum about movement of the head 🗸 / balance(b) It controls all voluntary actions🗸It receives and interprets all sensations🗸 viz. sight, hearing, smell, taste. It controls all higher thought processes🗸 such as memory,  judgement, and reasoning. Any 1  | (1)(1) |
|  | 1.4.3 | (a) Pituitary gland/hypophysis🗸(b) LH🗸 / luteinising hormone | (1)(1) |
|  |  |  | **(6)** |

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| 1.5 |  |  |  |
|  | 1.5.1 | (a) Spindle fibres🗸(b) Centromere🗸(c) Centriole🗸 | (1)(1)(1)(1) |
|  |  |  |  |
|  | 1.5.2 | (a) Metaphase II🗸(b) Anaphase I🗸 | (1)(1) |
|  |  |  |  |
|  | 1.5.3 | 4🗸 | (1) |
|  |  |  |  |
|  | 1.5.4 | Crossing over🗸 | (1) |
|  |  |  |  |
|  | 1.5.5 | 2🗸 | (1) |
|  |  |  |  |
|  | 1.5.6 | Metaphase I🗸 | (1) |
|  |  |  |  |
|  | 1.5.7 | * Reduces the number of chromosomes by half🗸 which results in the formation of gametes
* Ensures that chromosome number remains constant within species🗸
 | (2) |
|  |  |  |  |
|  | 1.5.8 | (a) Ovaries🗸 (b) Testes/seminiferous tubules🗸  | (1)(1) |
|  |  |  | **(13)** |

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|  | **TOTAL SECTION A:** | **50** |

section b

question 2

|  |  |  |  |
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| 2.1 | 2.1.1 | Day 14🗸 | (1) |
|  |  |  |  |
|  | 2.1.2 | There is an marked increase 🗸 in LH levels in the blood 🗸 from day 12 to 14 | (2) |
|  |  |  |  |
|  | 2.1.3 | There is a developing / growing follicle 🗸 in the ovary which is secreting the oestrogen 🗸 causing the increasing levels  | (2) |
|  |  |  |  |
|  | 2.1.4 | * Oestrogen causes the endometrium 🗸 / lining of the uterus
* to become thicker and more vascular 🗸
* in preparation for implantation of the zygote 🗸

any 2  | (2) |
|  |  |  |  |
|  | 2.1.5 | (a) No 🗸(b) - The progesterone level has dropped.🗸 This means that the corpus luteum has degenerated 🗸* FSH levels begin to rise🗸 as progesterone is no longer inhibiting secretion 🗸

**(Mark first ONE only)** Any 1x2 | (1)(2) |
|  |  |  | **(10)** |
|  |  |  |  |
| 2.2 | 2.2.1 | The enzymes secreted by the acrosome digest the outer coat of the ovum 🗸  | (1) |
|  |  |  |  |
|  | 2.2.2 | Tail 🗸 / flagellum | (1) |
|  |  |  |  |
|  | 2.2.3 | * the tail is very long 🗸
* to create wavelike movement🗸
* and propel the sperm 🗸 through seminal fluid

 Any 2  | (2) |
|  |  |  |  |
|  | 2.2.4 | * Mitochondrion 🗸
* Provides energy to the spermatozoa🗸 to swim to reach the ovum
 | (2) |
|  |  |  |  |
|  | 2.2.5 | * accessory organs🗸 / prostate
* produce alkaline fluid🗸 to neutralize acids in urine
 | (2) |
|  |  |  |  |
|  | 2.2.6 | 35oC🗸 / 2oC lower than body temperature | (1) |
|  |  |  | **(9)** |

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| 2.3 | 2.3.1 | **Total amount of solid waste in a town from 1999 to 2004****Total amount of solid waste (tons)**graph - solid waste**Year** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **Criterion** | **Elaboration** | **Mark** |
| Type of graph | Line graph drawn  | 1 |
| Caption | Includes both variables | 1 |
| X-axis | Correct label and units and correct scale  | 1 |
| Y-axis | Correct label and units and correct scale | 1 |
| Plotting of points | 1 mark: 1 – 4 points plotted correctly2 marks: All 6 points plotted correctly | 2 |

 | (6) |
|  |  |  |  |
|  | 2.3.2 | 388 – 300 🗸= 88🗸 tons🗸 | (3) |
|  |  |  |  |
|  | 2.3.3 | * **Construction of more landfills**🗸– Could create a negative impact on the environment🗸 / land pollution / seepage into groundwater
* **Recycling of materials such as glass, plastic, metal**🗸

 Decrease pollution of the environment🗸* **Combustion of waste**🗸– Positive on land pollution, but negative on air pollution🗸
* **Composting of organic matter**🗸– increases the fertility of the soil
* **Providing incentives/education to the public to recycle their rubbish**🗸– reduces pollution🗸

**(Mark first TWO only)** Any 2x2**(One mark for strategy, and one mark for impact)** | (4) |
|  |  |  | **(13)** |

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| 2.4 |  |  |  |

 | 2.4.1 | * Excess CO2 leads to global warming🗸
* because of the enhanced greenhouse effect🗸
* global warming could cause drought and floods / changes in weather patterns 🗸
 | (3) |
|  |  |  |  |
|  | 2.4.2 | * **Availability**
* Alien invasive plants may use water excessively🗸
* and thus reduce the amount of water available for the natural vegetation🗸 of an area
* **Quality**
* Alien invasive water plants in excess causes increased eutrophication🗸,
* blocking the waterways, reducing light to other aquatic plants🗸.
* These plants eventually die and decompose🗸.
* Bacteria that decompose these plants eventually depletes the oxygen supply in the water🗸,
* causing other plants and animals to die / suffocate. 🗸
* decreasing the quality🗸 of water

or * alien invasive aquatic plants outcompetes🗸 indigenous aqautic plants
* cause negative effect🗸 on water ecosystems🗸
* could cause animal and plants (organisms) to die🗸
* depleting oxygen🗸 in water
* causing decrease in water qaulity🗸

Any  | (2)(3) |
|  |  |  | **(8)** |
|  |  |  | **(40)** |

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| **QUESTION 3** |  |
|  |  |  |  |
| 3.1 | 3.1.1 | I🗸 – fovea centralis 🗸 / yellow spot | (2) |
|  |  |  |  |
|  | 3.1.2 | Light has to pass through **B,** the cornea🗸, **C** the pupil🗸and**G**, the lens🗸 before reaching **H** , the retina. **(The learner must give the name and letter for each structure****to get the mark.)** | (3) |
|  |  |  |  |
|  | 3.1.3 | * **E** / the ciliary muscles relax 🗸
* ciliary body goes back to normal position🗸 / moves backwards
* tension on **J** / the suspensory ligaments🗸
* increases🗸
* causing them to become taut🗸 / tight
* thereby pulling on **G** / the lens🗸
* **G** / the lens becomes flattened / less convex / less round 🗸
* causing the refractive power of **G** / the lens is decreased🗸
* and a clear image of the distant object / bird is formed on the
* retina 🗸

Any  | (7) |
|  |  |  | **(12)** |
|  |  |  |  |
| 3.2 | 3.2.1 | A mechanism in the human body that detects changes🗸 or imbalances in the internal environment and restores the balance🗸 | (2) |
|  |  |  |  |
|  | 3.2.2 | * Thyroxin levels increases above normal limits causing the pituitary gland to produce less TSH🗸
* Low levels of TSH🗸 inhibits stimulation🗸
* of the thyroid gland🗸
* The thyroid gland secretes less thyroxin🗸
* The thyroxin level thus decreases🗸 in the blood
* Thyroxin returns to normal🗸 Any
 | (5) |
|  |  |  | **(7)** |
|  |  |  |  |
| 3.3 | 3.3.1 | Cold environmental conditions🗸 | (1) |
|  |  |  |  |
|  | 3.3.2 | * blood vessels are dilated🗸
* to increase blood flow to the skin surface 🗸
* so that more heat is lost🗸 from the blood through radiation
 | (3) |
|  |  |  | **(4)** |
|  |  |  |  |

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| 3.4 | 3.4.1 | Between 07:00 – 08:00🗸. | (1) |
|  |  |  |  |
|  | 3.4.2 | 93 mg / 100ml🗸 (accept range 92 – 94) | (1) |
|  |  |  |  |

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|  | 3.4.3 | * After a meal or during digestion, glucose is absorbed into the blood / blood glucose levels increase 🗸
* Insulin released by pancreas, insulin levels increase🗸
* Stimulates the conversion of excess glucose🗸 into glycogen🗸
* which is stored in the liver / muscles 🗸
* stimulates the body cells to use glucose for cellular respiration🗸
* This helps to drop raised blood glucose levels after a meal🗸

Any 4 | (4) |
|  |  |  |  |
|  | 3.4.4 | Insulin levels will not rise after a meal / would stay the same and would remain relatively low🗸. | (1) |
|  |  |  | **(7)** |
|  |  |  |  |
| 3.5 | 3.5.1 | (a) gravity /the effect of the force of gravity🗸(b) the direction of growth of young roots 🗸 | (1)(1) |
|  |  |  |  |
|  | 3.5.2 | * Same species of seedlings 🗸
* Same temperature 🗸
* Same light conditions 🗸
* Same age of seedlings 🗸
* Same amount of water 🗸
* Place in the same place🗸
* same method of mounting 🗸
* same initial direction of roots🗸
* same type of cork disk 🗸

**(mark first TWO only)** Any 2 |  (2) |
|  |  |  |  |
|  | 3.5.3 | * Repeat the investigation🗸
* Increase the sample size🗸 / use more than 6 seedlings

**(mark first ONE only)** Any 1 | (1) |
|  |  |  |  |
|  | 3.5.4 | * To remove the effect of gravity 🗸
* on the direction of growth of young roots/act as a control 🗸
 | (2) |
|  |  |  |  |
|  | 3.5.5 | Radicles in apparatus **B** bend or grow downwards 🗸 and grow towards gravity/positive geotropism . 🗸 | (2) |
|  |  |  |  |
|  | 3.5.6 | The force of gravity (cancel tick),has an effect on the direction of growth of young roots/causes roots to grow downwards. 🗸 | (1) |
|  |  |  | **(10)** |
|  |  |  | **(40)** |
|  |  |  |  |
|  |  | **TOTAL SECTION B:** | **80** |

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| **SECTION C** |  |  |
| **QUESTION 4** |  |  |
|  |  |  |  |
|  | **Reflex action*** Pain receptors in the skin of his foot become stimulated🗸
* They convert the stimulus of pain into an impulse🗸
* which is then transmitted by the sensory neuron🗸
* through the dorsal root of the spinal nerve🗸
* into the spinal cord🗸
* Synaptic contact is made🗸
* with the interneuron🗸
* and then with the motor neuron.🗸
* An impulse is then transmitted by the motor neuron via the ventral root🗸
* of the spinal nerve🗸
* to the effector organ / muscle🗸
* which contracts to withdraw his foot. 🗸

**Max 8****Balance*** The cristae 🗸
* found in the ampulla 🗸
* at the base of the semi-circular canals 🗸
* are stimulated by the change in direction and speed of the head.🗸
* The maculae 🗸
* in the utriculus 🗸
* and sacculus 🗸
* are stimulated by the change in the position of the head.🗸
* Impulses are generated 🗸
* and transmitted via the auditory nerve🗸
* to the cerebellum🗸 which also
* sends impulses to the muscles🗸
* enabling the person to maintain balance and body position.🗸

 **Max 9**  |  |
|  | Content:Synthesis**:** | (17)(3)**(20)** |

**ASSESSMENT OF ESSAY**

|  |  |  |  |
| --- | --- | --- | --- |
| **Criterion** | **Relevance (R)** | **Logical sequence (L)** | **Comprehensive (C)** |
| **Generally** | All information provided is relevant to the topic. | Ideas are arranged in a logical / cause-effect sequence. | All aspects required by the essay have been sufficiently addressed.  |
| **In this essay** | Only information relevant to the reflex arch and balanceis given. (There is no irrelevant information.) | Generally each action is appropriately linked to the reflex action as well as how the person managed to maintain balance and body position with ideas arranged in a **logical sequence.** | The reflex action that takes place as well as how the person managed to maintain balance and body position is described. Reflex action 5 / 7 and balance 7 / 9 |
| **Mark** | R✓  | L✓ | C✓  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Total Section C:****TOTAL:**  |  | **20****150** |