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Life Sciences

Grade 12

Practice Test

MEMORANDUM

**Date: July 2020
Duration: 1 Hour
Total Marks: 70**

**Examiner:
Moderator:**

Number of Pages: 5

SECTION A**QUESTION 1**

1.1.1 C

1.1.2 D

1.1.3 C

1.1.4 A

(4 × 2) (8)

1.2.1 TROPISM

1.2.2 CONJUNCTIVA

1.2.3 NEUROTRANSMITTERS

(3 × 1) (3)**TOTAL SECTION A: 11****SECTION B****QUESTION 2**

2.1.1 negative feedback ✓

(1)

2.1.2 A – pancreas ✓

D – liver ✓

(2)

2.1.3 B – insulin ✓

C – glucagon ✓

(2)

2.1.4 (a) Type II ✓ diabetes mellitus

(1)

(b) ONE of the following

Follow a balanced diet

Eat low GI carbohydrates

Lose weight

Exercise regularly

(1)

2.1.5 Glucose is needed for increase cellular respiration ✓ in the skeletal muscles ✓ (2)

2.1.6 ONE of the following (2 marks)

Glycogen is a large molecule ✓ so it won't be lost from the cell by diffusion ✓

Glycogen is osmotically inactive / doesn't lower water potential of cell ✓
extra water will thus not enter the cell by osmosis ✓

(2)

(11)

- 2.2.1 C ✓ adrenal gland ✓ (2)
- 2.2.2 (a) More blood can be pumped to organs that need it ✓ to supply oxygen and glucose ✓ (2)
- (b) More light can be directed to the retina ✓ for better vision ✓ (2)
- 2.2.3 On a hot day, the body will produce sweat for thermoregulation ✓
So water that would be lost in urine needs to be conserved ✓
Gland A (pituitary) releases ADH / vasopressin ✓ when the water level of the blood passing through the hypothalamus is detected to be lower ✓
ADH travels via the blood to its target organ, the kidney ✓
ADH causes the collecting ducts to become more permeable to water ✓
So more water is thus re-absorbed from the urine ✓ / less is lost in urine ✓
(any 6) (6)
- (12)**

QUESTION 3.**3.1**

- 3.2.1 (a) Auxin concentration ✓ (1)
- (b) Plumule growth ✓ (1)
- 3.2.2 For measurement of the plumule length ✓ (1)
- 3.2.3 - To simulate the same conditions ✓ under which germination takes place for the normal growth ✓ of the seedlings
- To expose the seedlings to uniform light ✓
so that no other variable is introduced/to ensure validity/ to allow upward growth of the plumule for easy measuring ✓!
(MARK FIRST ONE ONLY) (Any 1 x 2) (2)
- 3.2.4 - They used seven seedlings in each group ✓ /35 seeds in total/a large sample
- They calculated the average ✓ increase in plumule length
(MARK FIRST ONE ONLY) (Any 1) (1)
- 3.2.5 - Same species of beans ✓
- Seedlings of the same age ✓
- Seedlings of the same size ✓
- Same temperature ✓
- The same investigator ✓
- Identical apparatus (beakers/petri-dishes/graph paper/grid/volume of solution) ✓ (Any 3) (3)
(MARK FIRST THREE ONLY)
- 3.2.6 An increase in auxin concentration up to an optimum stimulates the growth rate of the plumule/stem. With further increase in auxin concentration there is an inhibition of plumule/stem growth ✓✓ (2)
- (11)**

3.2

3.4.1

(a) Volume of urine✓ (1)

APPROVED MARKING GUIDELINES
PUBLIC EXAMINATION

- (b) - Decide on a time✓/date/place to conduct the investigation
 - Decide on the apparatus✓/materials that need to be used
 - Decide how to record the data✓
 - Decide on the number of participants to include✓
 - Decide what factors to keep constant✓/example of factor to be kept constant
 - Decide on the composition of the sample✓
 - Develop an indemnity form for the participants to sign✓
 - Recruit✓/get permission from volunteers to participate
(Mark first TWO only)

Any (2)

- (c) - The same room✓/environment/temperature
 - The same apparatus✓
 - The same investigator✓
 - No other liquid intake by both groups✓
 - Same type of beer✓
(Mark first TWO only)

Any (2)

- (d) - They used a large sample✓/12 men/6 men in each group
 - The average volume of urine produced was calculated✓
(Mark first TWO only)

(2)

- 2 - Alcohol inhibits/reduces the secretion of ADH✓
 - causing the renal tubules✓/distal convoluted tubules and collecting ducts
 - to become less permeable to water✓
 - Less water is reabsorbed✓ back into the blood
 - A larger volume of urine is produced✓

Any (4)
(11)

TOTAL SECTION B: 45

SECTION C
QUESTION 4

Response in lifting the foot:

A spinal **reflex action** occurs along a **reflex arc** ✓ to **prevent further damage** of the tissues in the foot ✓

Nociceptors / **free nerve endings** / **receptors** ✓ in the skin of his foot will **convert** ✓ the stimulus into an impulse

This impulse will then be relayed via the axon of a **sensory neuron** ✓ to the spinal cord

The sensory neuron transmits the impulse **via the dorsal root** ✓ of the spinal nerve to the **grey matter** ✓ of the spinal cord

In the (gray matter of the) spinal cord, the sensory neuron relays an impulse to a **connector neuron**, ✓ via **synapses** with sensory neuron’s axon end bulbs which in turn relays an impulse to the **cell body / dendrites of a motor** / efferent neuron ✓

The motor neuron exits the spinal cord via the **ventral root** ✓ and the impulse is conducted along the motor neuron’s **axon** ✓ through the spinal nerve to the **effector (leg muscle)** ✓

These muscles **contract** to bring about **lifting of the foot** ✓ ANY 8

(11)

Synthesis: ✓✓✓

(3)

	DESCRIPTION
R (Relevance)	ALL info presented relates to the topic
C (Comprehensiveness)	Addresses the topic completely: 8/11
L (Logic)	Presents info in a logical way <ul style="list-style-type: none"> • Pathway of reflex action

[14]

TOTAL SECTION C: 14

GRAND TOTAL: 70