BERGVLIET HIGH SCHOOL

GRADE 11 LIFE SCIENCES NOVEMBER PAPER 1

TIME: 2 HR 30MINS

150 MARKS

EXAMINER: S. LAMBRECHTS

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MEMORANDUM

SECTION A

QUESTION 1

1.1.1 **C** ✓✓
1.1.2 **A** ✓✓
1.1.3 **C** ✓✓
1.1.4 **D** ✓✓
1.1.5 **B** ✓✓
1.1.6 **C** ✓✓
1.1.7 **D** ✓✓
1.1.8 **C** ✓✓
1.1.9 **A** ✓✓
1.1.10 **A** ✓✓

(10 x 2 = 20)

1.2.1 Excretion ✓
1.2.2 Chewing / mastication ✓
1.2.3 Adenosine Triphosphate / ATP ✓
1.2.4 Glucagon ✓
1.2.5 Bronchi ✓
1.2.6 Glycolysis ✓
1.2.7 Medulla oblongata ✓
1.2.8 Assimilation ✓ **(8 x 1 = 8)**

1.3.1 BOTH A & B ✓✓
1.3.2 NONE ✓✓
1.3.3 B only ✓✓
1.3.4 A only ✓✓

(4 x 2 = 8)

1.4.1 To demonstrate that light (energy) ✓ is necessary for photosynthesis ✓ (2)
1.4.2 Plant was placed in a dark cupboard for 24 - 48 hours ✓ (1)
1.4.3 Iodine solution ✓ (1)
1.4.4 Presence or absence of starch / colour change / photosynthesis ✓ (1)
1.4.5 (a) No colour change / remain reddish/yellow/orange brown ✓ (1)
(b) Turns blue-black ✓ (1)
1.4.6 Oxygen / O_2 ✓ (1)

(8)

1.5.1 (a) Chloroplast ✓

(b) Photosynthesis ✓ (1)

1.5.2 A ✓ Granum/Grana ✓ (2)

1.5.3 - Part A (granum) contains chlorophyll ✓

- Chlorophyll absorbs light energy ✓ (2)

(6)

[Total Section A Question 1: 50]

SECTION B

QUESTION 2

2.1.1 B ✓ (1)

2.1.2 - the diaphragm contracts ✓

- and becomes less convex (flattens downward) ✓
- The intercostal muscles contract ✓
- and lift the ribs up and outward ✓
- The total volume of the thoracic cavity increases ✓
- and pressure on the lungs decreases. ✓
- Since the atmospheric pressure is greater than the pressure on the lungs, ✓ / pressure difference
- air rich in oxygen is drawn in through the air passages into the lungs. ✓

(any 6)

2.1.3 Glass tube – Trachea ✓

Bell jar – Thoracic cavity/thorax ✓

Rubber sheet – Diaphragm ✓ (3)

2.1.4 The balloon would not inflate. ✓

This is because the hole in the rubber sheet causes the pressure within the bell jar to become equal to the atmospheric pressure. ✓ / a vacuum won't be created (2)

(12)

2.2.1 (a) Oxygen ✓ (1)

(b) Diffusion ✓ *(not gaseous exchange)* (1)

2.2.2 (a) A ✓ capillary ✓ (2)

(b) D ✓– Erythrocyte ✓ / Red blood cell ✓ (2)

2.2.3 (a) Squamous epithelium ✓ (1)

2.2.4 Pulmonary vein ✓ (1)

2.2.5 The moisture in the alveoli allows oxygen and carbon dioxide to dissolve / be in solution ✓ which helps them diffuse ✓more quickly across the alveoli membrane (2)

2.3 - Receptors in the carotid artery are stimulated✓ and
- impulses are sent to the medulla oblongata✓
- The medulla oblongata stimulates the heart✓
- to beat faster✓ causing
- more carbon dioxide to be taken to the lungs✓
- The breathing muscles✓/intercostal muscles and diaphragm
- contract more actively✓ and
- the rate and depth of breathing increases✓
- More carbon dioxide is exhaled✓
- The carbon dioxide level in the blood decreases✓ /returns to normal (Any 6) (6)

(16)

2.4.1 (a) cellular respiration ✓ (1)
(b) gas / CO_2 (released) ✓ (1)

2.4.2 Carbon dioxide ✓ (1)

2.4.3 The clear lime water turns milky ✓ in the presence of carbon dioxide (1)

2.4.4 - Germinating seeds are actively growing plant parts ✓
- therefore, the rate of respiration is higher ✓ than in any other parts of the plant
- since more energy ✓ is required for the active growth process

(Any 2) (2)

2.4.5 - No cellular respiration takes place in the dead seeds ✓
- as a result, no carbon dioxide is released ✓ therefore, clear lime water remains clear ✓ (Any 2) (2)

2.4.6 - gases can move through the cotton wool ✓
- allowing them to reach the lime water ✓

OR

- The rubber block does not allow gases to move through ✓
- and so it would not reach the lime water ✓ (2)

2.4.7 - Repeat the experiment ✓
- use more seeds ✓/ increase sample size (Any 1) (1)

2.4.8 - Temperature ✓
- Light ✓ / light intensity (2)

(13)

2.5.1 Carbon dioxide ✓ (1)

2.5.2 Lactic acid ✓ (1)

2.5.3

Aerobic respiration	Anaerobic respiration
Occurs in the presence of oxygen.	Occurs in the absence of oxygen.
Products are carbon dioxide and water.	Products are lactic acid (animals) or carbon dioxide and ethanol (plants/yeast cells).
A large amount of energy is released (38 ATP).	A small amount of energy is released (2 ATP)
Takes place in the cytoplasm and mitochondria.	Takes place only in the cytoplasm.
Complete breakdown of glucose	Incomplete breakdown of glucose

Any three + table (7)

(9)

[50]

QUESTION 3

3.1.1 (a) Aorta ✓ (1)

(b) (Inferior) vena cava ✓ (1)

3.1.2 (a) Renal artery ✓ (1)

(b) Ureter ✓ (1)

(c) (Urinary) Bladder ✓ (1)

3.1.3 - Excretion ✓ / removal of nitrogenous / metabolic waste

- Regulation of salt content of body ✓
- Regulation of blood pH ✓
- Regulation of water content of the body ✓/osmoregulation

(Any 2 x 1) (2)

(7)

3.2.1 E: rectum ✓
G: small intestine / jejunum / ileum ✓ (2)

3.2.2 a) H ✓ (1)
b) F ✓ (1)
c) C ✓ (1)

(5)

3.3.1 Small intestine / duodenum ✓ (1)

3.3.2 B: Villi ✓

C: Columnar epithelium / microvilli ✓

D: Goblet cell ✓ (3)

3.3.3 - Cells have microvilli✓ that increases the surface area ✓

- Lacteal ducts / capillaries✓ form transport ✓ system / medium
- Single layer of (epithelial) cells✓ are thin enough for rapid diffusion✓
- Goblet cells ✓ secrete mucus✓

(Any 2 x 2) (4)

3.3.4 a) F ✓ (1)

b) Lipase ✓ (1)

3.3.5 a) Insulin ✓ (1)

b) facilitating the body cells to absorb more glucose from the blood ✓
stimulating the liver✓ and muscles ✓
to convert glucose into glycogen✓ and to store it ✓
this decreases the glucose levels in the blood ✓

(any 4)

3.4.1 A: Afferent arteriole ✓
C: Glomerulus ✓
D: Bowman's capsule ✓
E: Efferent arteriole ✓ (4)

3.4.2 - Blood vessel A is wider than blood vessel E ✓
- and causes high blood pressure ✓ at Part C that
- leads to the leakage / forcing out of blood plasma ✓ into part D (3)

3.4.3 Blood cells / plasma proteins ✓ Any (1)

3.4.4 Podocytes ✓ (1)

3.4.5 Presence of slit / pores ✓ act as selective filters ✓ / allowing only fairly small particles to pass through into the capsular space. (2)

(11)

3.5.1 A condition characterised by excess sodium in the blood ✓ (1)

3.5.2 - Too much water loss ✓
- High intake of salt ✓/ sodium ✓ (1)

3.5.3 - The high concentration of sodium ✓ creates
- a steeper concentration gradient ✓/ decreases the water potential in the medulla
- which leads to the passive reabsorption of water ✓ / causing water to be drawn out of filtrate

(3)

3.5.4 - receptor cells in the arterioles ✓ are stimulated.
- The adrenal gland ✓ secretes and releases
- more aldosterone into the blood ✓
- which causes the reabsorption of more sodium ✓ by the capillaries
- at the distal and collecting / renal tubules ✓
- Sodium in the blood increases ✓ and returns to normal (Any 4 x 1) (4)

3.5.5 - the permeability of the renal tubules is increased ✓
- and therefore more water is reabsorbed ✓

(2)

(12)

[50]

[Total Section B: 100]

GRAND TOTAL: 150 MARKS