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Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjahabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2024

LIFE SCIENCES P1

MARKS: **150**

TIME: **2½ hours**

* I L F S C E 1 *

This question paper consists of 14 pages.

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INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK provided.
3. Start the answer to EACH question at the top of a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Present your answers according to the instructions of each question.
6. Do ALL drawings in pencil and labelled them in blue or black ink.
7. Draw diagrams, tables or flow charts ONLY when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. Do NOT use graph paper.
10. You may use a non-programmable calculator, protractor and a compass, where necessary.
11. All calculations to be rounded off to TWO decimal spaces.
12. Write neatly and legibly.

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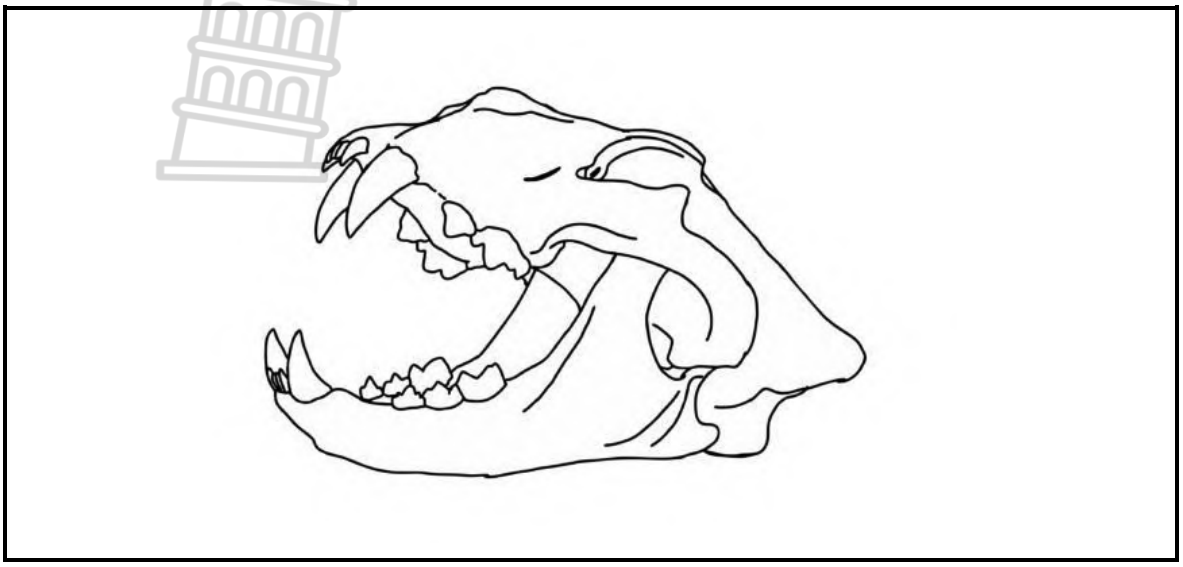
SECTION A

QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (1.1.1 to 1.1.9) in the ANSWER BOOK, for example 1.1.10 A.

Study the diagram below of an animal's skull and answer QUESTIONS 1.1.1 to 1.1.2.



1.1.1 The above skull is that of a …

A omnivore because of large canines and flat molars.
B carnivore because of reduced molar number.
C omnivore because of canines, incisors and molars are present.
D carnivore because of large canines and sharp molars.

1.1.2 A function of the incisors of such an animal would be to:

A Grind and crush food
B Catch and hold onto prey
C Bite and cut food
D Kill prey and tear-off flesh

1.1.3 Which ONE of the options listed below CORRECTLY summarises the waste product for each of the excretory organs?

	LUNGS	SKIN	LIVER	KIDNEY
A	CO_2	Water	Urine	Bile
B	CO_2	Water	Urea	Urine
C	Water vapour	Bile	Water	Salts
D	Urea	Water	Bile	CO_2

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1.1.4 It is recommended that athletes train at a higher altitude for at least two weeks before a major event to increase the number of red blood cells in their body. The number of red blood cells increase to …

A increase oxygen absorption because of the low oxygen levels in the atmosphere.
B allows the body time to remove excess carbon dioxide due to higher levels of carbon dioxide in the atmosphere.
C increase the amount of carbon dioxide exhaled due to high oxygen levels in the atmosphere.
D allows the body to absorb more oxygen due to high levels of oxygen in the atmosphere.

1.1.5 The reason for boiling the leaf in alcohol during a starch test is to …

A remove chlorophyll.
B show if starch is present.
C break cells walls making cells more permeable.
D kill the plant cells.

1.1.6 If the blood pH decreases, the kidneys will …

A increase the absorption of urea into the blood.
B decrease the secretion of hydrogen ions into the tubules.
C increase the re-absorption of bicarbonate ions into the blood.
D decrease the absorption of sodium ions into the blood.

1.1.7 Study the list below and answer the question.

(i) Water
(ii) CO_2
(iii) Hydrogen (H^+) ions
(iv) Radiant energy

Which of the above listed reactants are required for photosynthesis?

A (i); (ii) and (iv)
B (i); (iii) and (iv)
C (iv) only
D (i) and (iv)

1.1.8 A plant's stomata close when temperatures exceed 30 °C.

What is the most likely factor to limit the photosynthetic rate after this happens?

A Oxygen concentration
B Light intensity
C Temperature
D Carbon dioxide concentration

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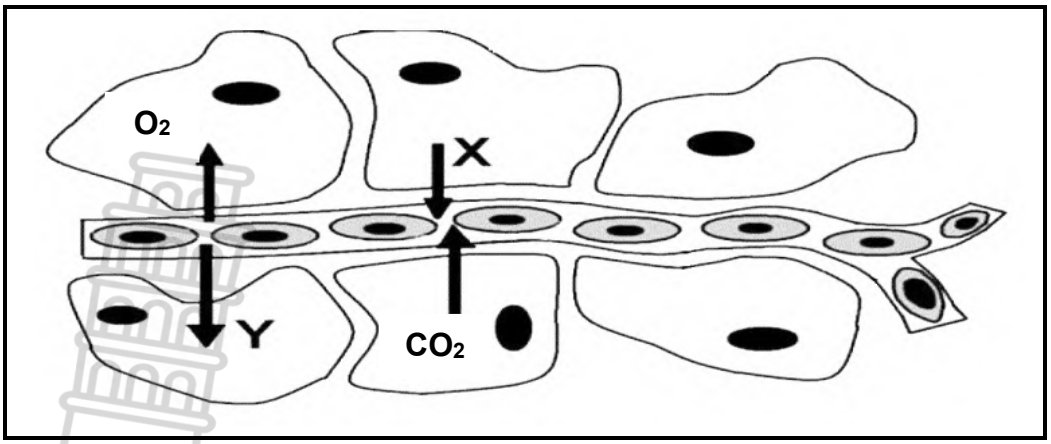
1.1.9 In the diagram below, identify the process occurring at **X** and **Y** between bodily tissue cells and a capillary.



A Gaseous exchange, active process
B Cellular respiration, passive process
C Gaseous exchange, passive process
D Cellular respiration, active process (9 x 2) (18)

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question numbers (1.2.1 to 1.2.9) in the ANSWER BOOK.

1.2.1 Organelle in plant cells that contain chlorophyll

1.2.2 Breathing muscle responsible for raising the rib cage during inhalation

1.2.3 Tubule responsible for transporting urine from the kidney to the bladder

1.2.4 Structures in the lung where gaseous exchange occur

1.2.5 The main photosynthetic tissue of the leaf

1.2.6 The breakdown of a water molecule into hydrogen and oxygen atoms during photosynthesis

1.2.7 Protective double membrane enclosing the lungs

1.2.8 Gas required for aerobic respiration

1.2.9 Patches of cells in the pancreas that secrete insulin and glucagon

(9 x 1) (9)

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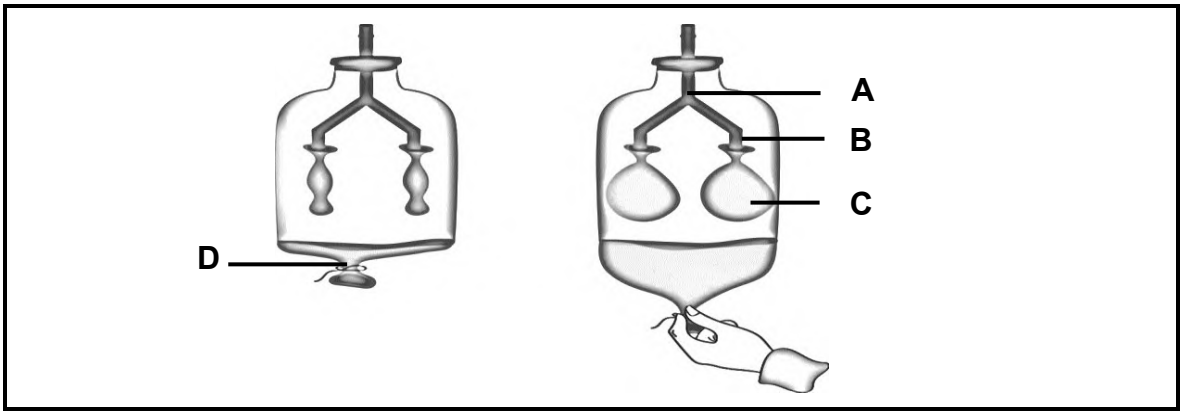
1.3 Indicate whether each of the following description in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN II. Write A only, B only, both A and B or none next to the question numbers (1.3.1 to 1.3.4) in the ANSWER BOOK.

	COLUMN I	COLUMN II
1.3.1	Structure(s) which prevents food particles from entering the lungs	A: Uvula B: Epiglottis
1.3.2	Region of the alimentary canal where most water is reabsorbed	A: Proximal convoluted tubule B: Small intestine
1.3.3	Lined with ciliated epithelium	A: Bronchi B: Trachea
1.3.4	Hormone(s) responsible for osmoregulation	A: Aldosterone B: Antidiuretic hormone

(4 x 2) (8)

1.4 The model of the lungs below is used to demonstrate the mechanism of breathing.



1.4.1 What structure in the respiratory system is label **A** representing? (1)

1.4.2 Describe the role played by **D** during inhalation. (2)

1.4.3 Give TWO reasons why the model does not truly represent the human gaseous exchange system. (2)

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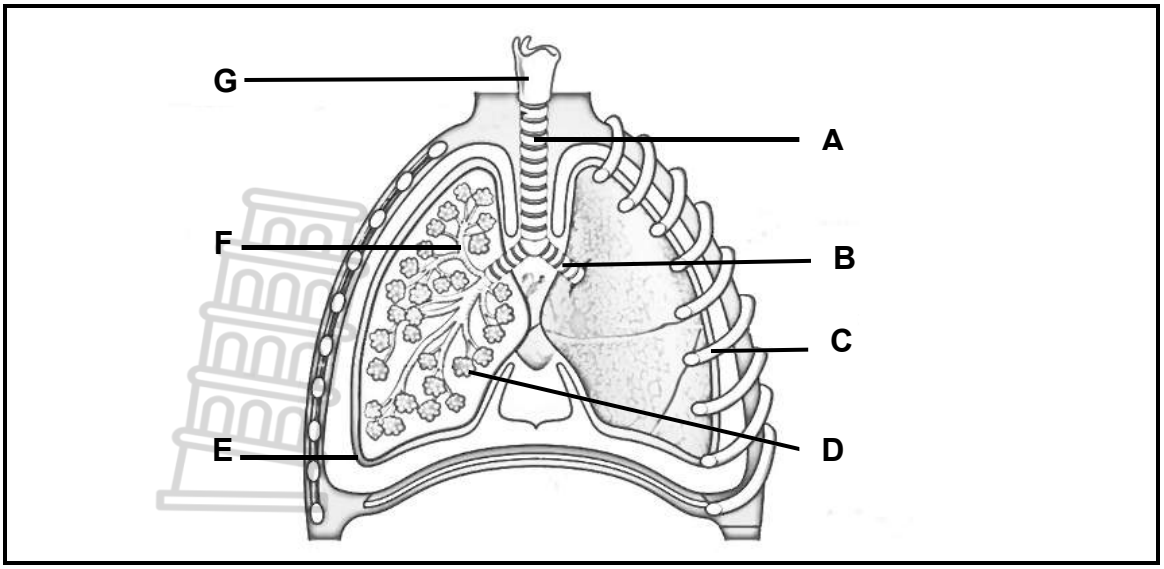
1.5 The diagram below represents part of the human gaseous exchange system.



1.5.1 Supply suitable labels for the following structures:

(a) **B** (1)

(b) **C** (1)

1.5.2 Explain TWO VISIBLE reasons why the above structure could be considered an effective gaseous exchange surface. (4)

1.5.3 Give the LETTER and NAME of the structure that:

(a) Contains cartilaginous cords which vibrate for sound production (2)

(b) Contains C-shaped cartilaginous rings (2)

[50]

TOTAL SECTION A: 50

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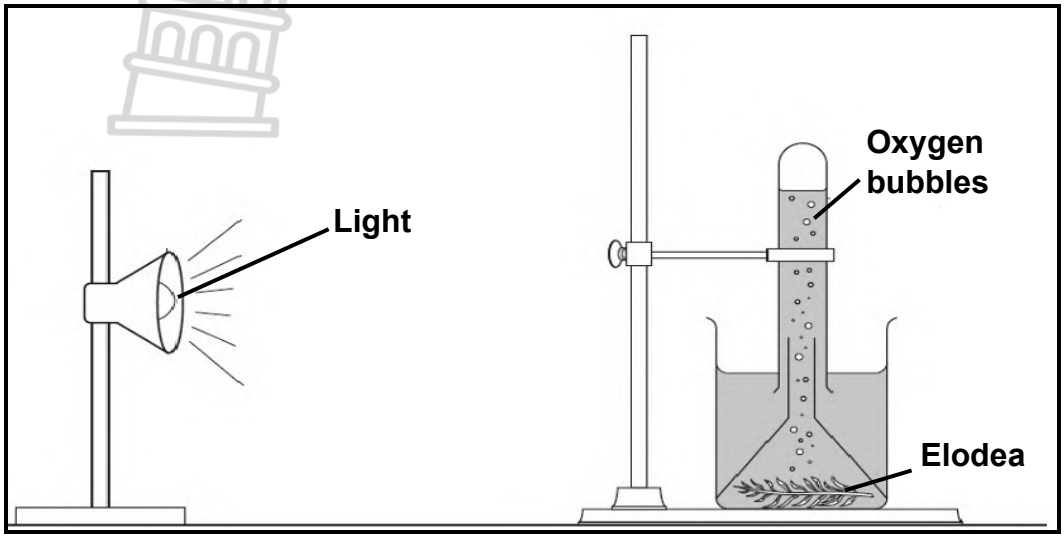
SECTION B

QUESTION 2

2.1 Scientists conducted a study to determine under which colour of light Elodea (waterweed) grows best. The experiment was conducted as follows:

- The apparatus was set up as in the diagram below
- Three experiments were set-up, each, under a different colour of light (blue, green or red)
- The distance from the light source in each, remained 30 cm



The average time taken to produce 20 oxygen bubbles was recorded in the table below.

COLOUR OF LIGHT	TIME (IN SECONDS) TO RELEASE 20 OXYGEN BUBBLES
Blue	40
Green	160
Red	80

2.1.1 Draw a histogram to represent the above data in the table. (6)

2.1.2 Why did the scientists use oxygen bubble production to look at the growth of the plant? (2)

2.1.3 Write the ratio for number of bubbles under green light compared to red light. (2)

2.1.4 Which light source should be recommended to grow plants under? (1)

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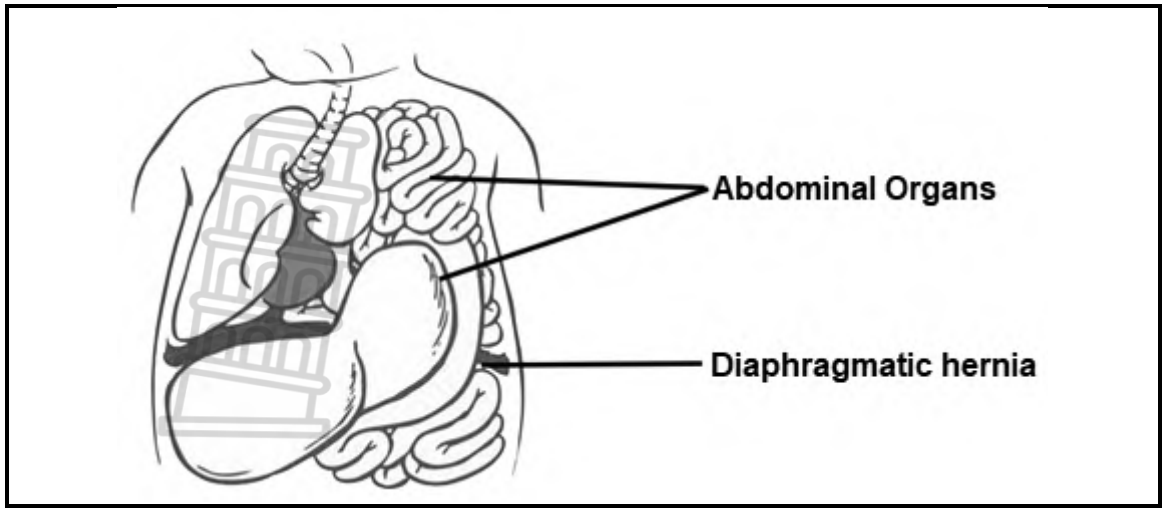
2.2 A serious motor vehicle accident resulted in a child having a perforated diaphragm (diaphragmatic hernia). His abdominal organs were pushed into his thoracic cavity. Symptoms included difficulty in breathing and a rapid heart rate.



2.2.1 Discuss how the hole in the diaphragm, caused by diaphragmatic hernia, will affect inhalation. (3)

2.2.2 Describe why the symptom of a rapid heart rate would occur. (5)

2.3 Researchers wanted to determine if living organisms require oxygen for aerobic respiration. Oxygen uptake can be measured using a respirator as shown in the set-up below.

- The apparatus consists of two flasks, one containing the living organism and the other glass beads.
- Both tubes contain the same volume of sodium hydroxide.
- Once the apparatus has been set up, the movement of the coloured liquid in the manometer (U-shaped tube containing a dyed fluid) will indicate how much oxygen is used.
- The decrease in oxygen in one tube increases pressure causing the coloured liquid to move up that tube.

The distance moved by the liquid in the manometer over time was measured to indicate the volume of oxygen taken in by the insect per minute. The findings were recorded in the table below.

	MOVEMENT OF DYE IN MANOMETER OVER TIME (CM)				
	0 min	**15 min**	**30 min**	**45 min**	**60 min**
FLASK A	0	+7	+13	+20	+28
FLASK B	0	-7	-13	-20	-28

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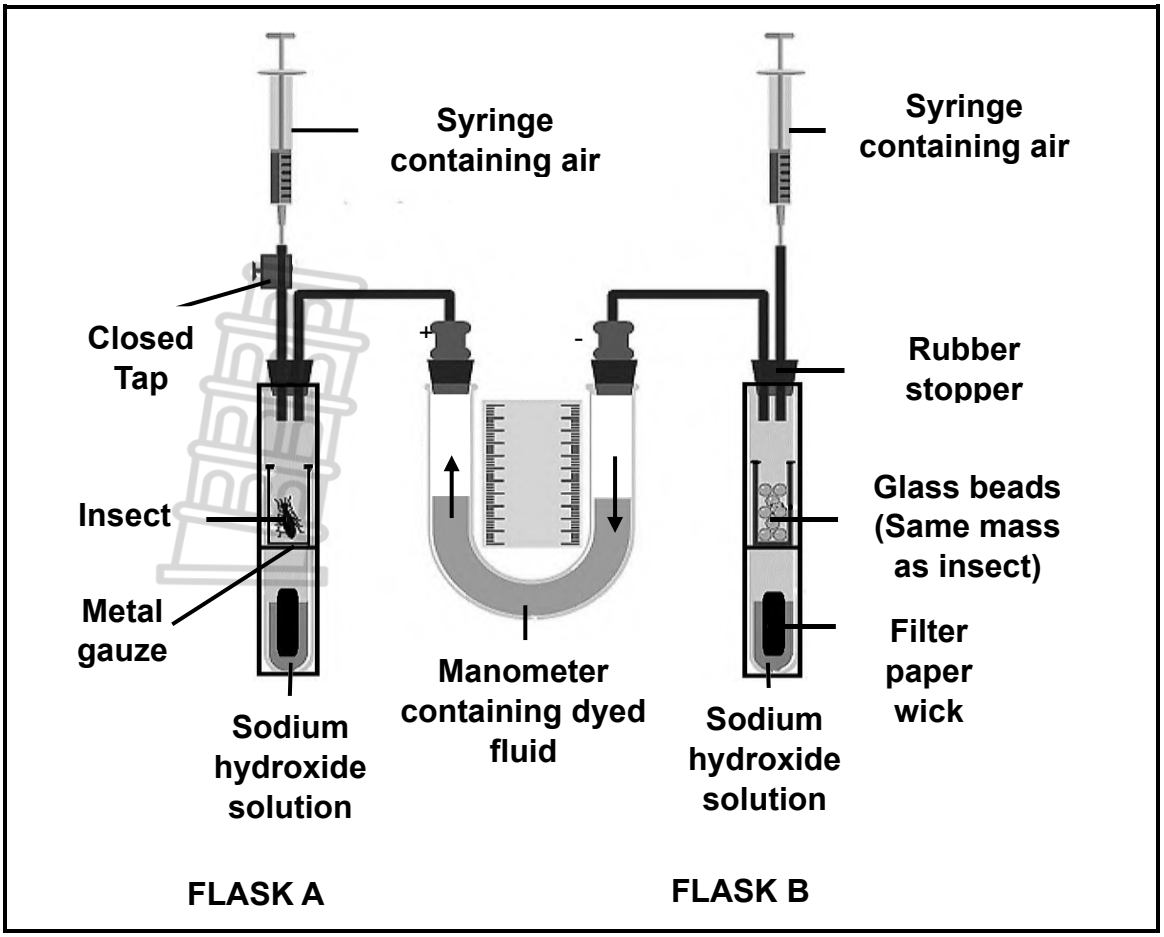

2.3.1 State the aim for this investigation. (2)

2.3.2 Identify the:

(a) Dependent variable (1)

(b) Independent variable (1)

2.3.3 Calculate the percentage increase of oxygen consumption from 30 minutes to 60 minutes in FLASK A. (3)

2.3.4 Explain ONE way how validity was ensured in this investigation. (2)

2.4 Respiration occurs in both aerobic and anaerobic conditions. These processes differ in plant and animal cells. In plant cells anaerobic respiration has been shown to hold several key economic uses and benefits.

2.4.1 Describe the process of the Kreb's cycle. (3)

2.4.2 How does anaerobic respiration differ in plant cells compared animal cells? (4)

2.4.3 Discuss TWO economic benefits of the use of anaerobic respiration in yeast. (4)

2.4.4 List ONE symptom of prolonged anaerobic respiration in muscles. (1)

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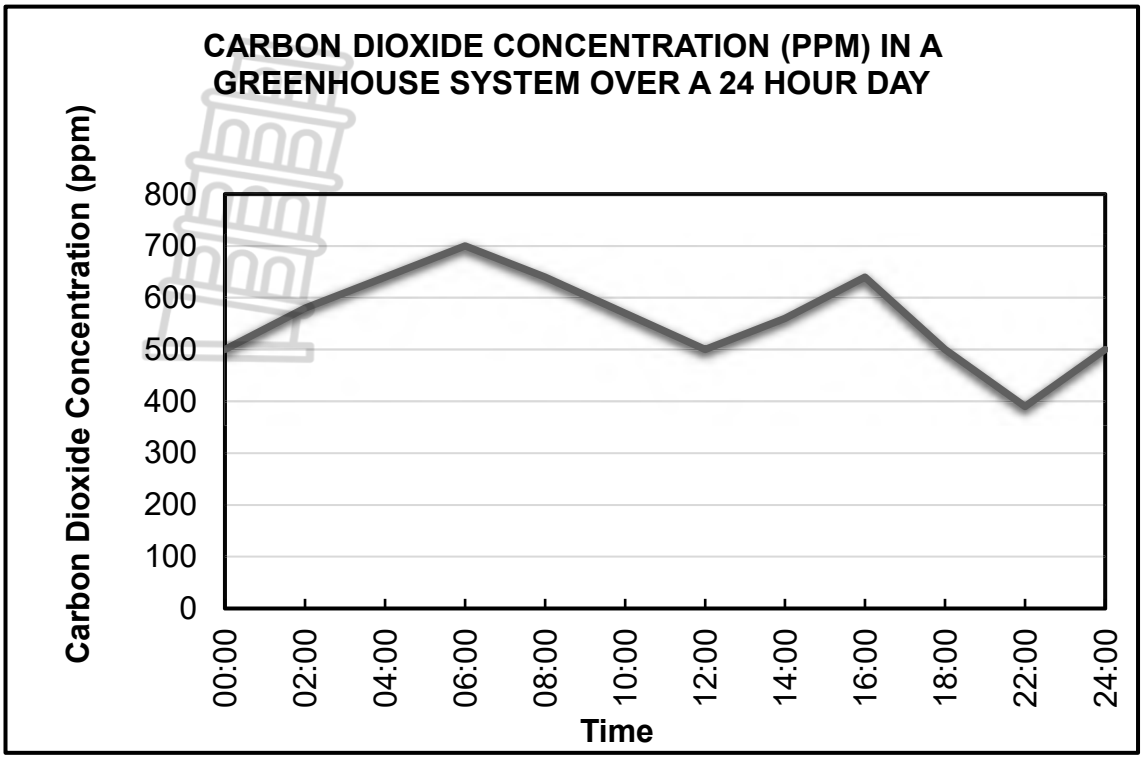
2.5 Greenhouses are enclosed structures used to grow plants under controlled conditions. Carbon dioxide levels are kept high during the day light hours so optimal photosynthesis can take place. The graph below displays the CO_2 concentration in a greenhouse over a 24-hour period. From 12:00 until 16:00 carbon dioxide was pumped into the greenhouse.



2.5.1 Name TWO other environmental conditions that can be controlled in a greenhouse. (2)

2.5.2 What causes the drop in CO_2 concentration from 06:00 to 12:00. (2)

2.5.3 Why should a farmer not exceed the recommended dosage of CO_2. (2)

2.5.4 After 16:00 no further carbon dioxide was pumped into the greenhouse.

Explain what would have caused CO_2 levels to increase from 22:00 until 06:00. (4)

[50]

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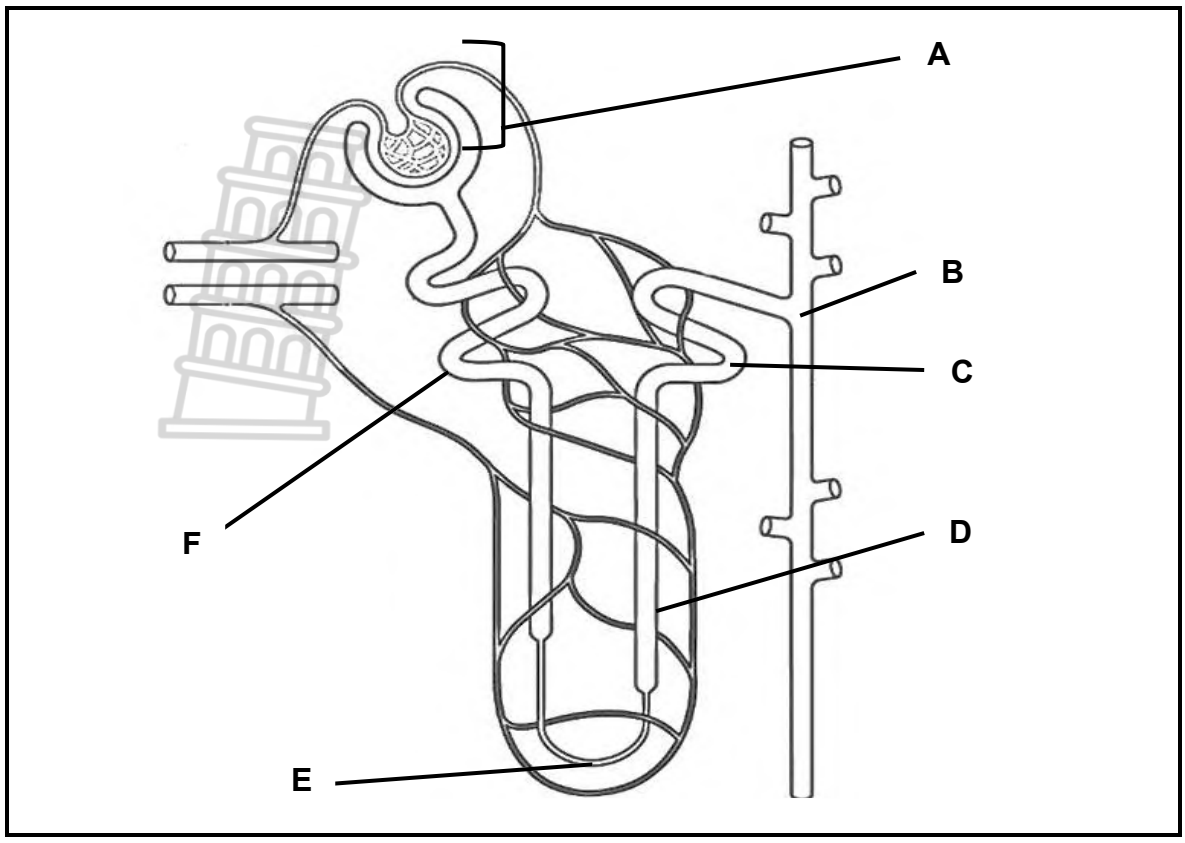
QUESTION 3

3.1 A line diagram of the nephron is shown below.



3.1.1 Give the LETTER and NAME of the part of the nephron where:

(a) Tubular excretion occurs (2)

(b) Sodium (salt) is actively pumped out (2)

3.1.2 Explain THREE structural adaptations of structure **A** for efficient filtration. (6)

3.1.3 Describe how the reabsorption of the following substance takes place from part **F**:

(a) Glucose (2)

(b) Water (2)

3.1.4 Describe the role of ADH on structure **B** and **C** when the body is dehydrated. (3)

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3.2 The chart below shows the composition of various solutes found in blood plasma, glomerular filtrate, and urine of a patient that came to the hospital after collapsing into a coma.

	PLASMA	FILTRATE	URINE
Glucose	>120	>90	50
Proteins	740–750	0	0
Urea	30	30	>1 200
Sodium	287	262	276
Water	900	900	687
Amino acids	0,5	0,5	0,0

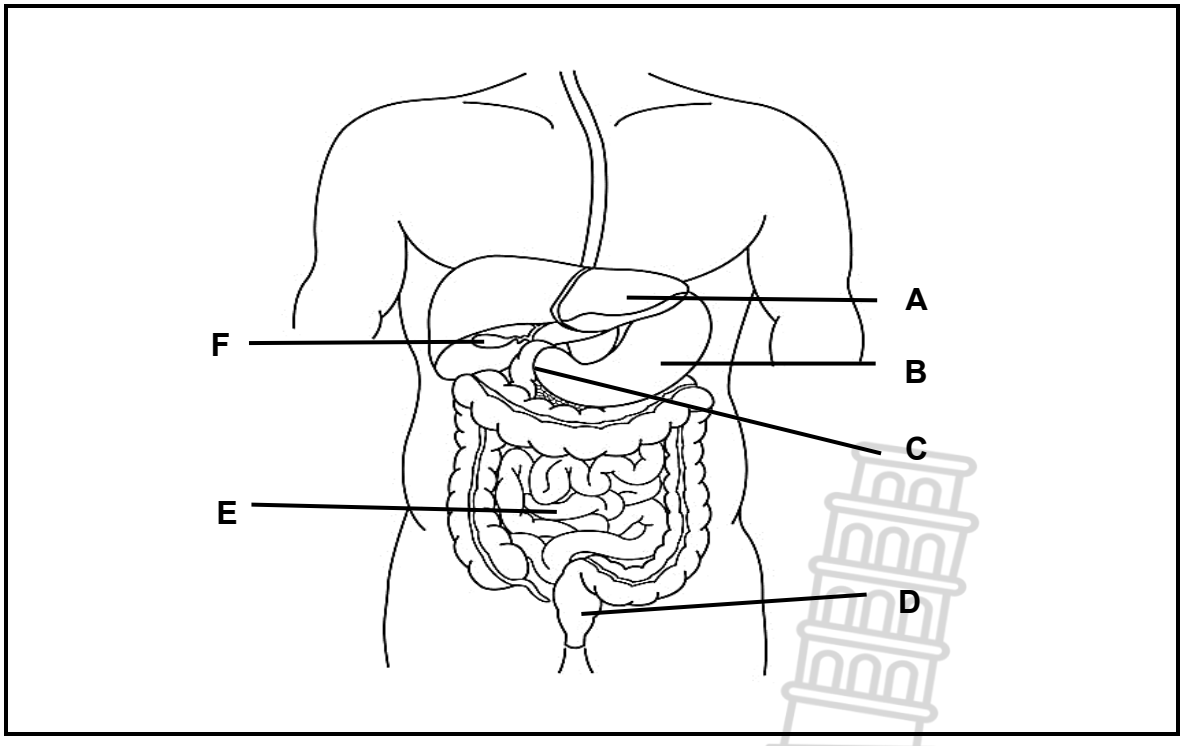
3.2.1 Identify the excretory product in the table above that is produced in the liver from deamination of amino acids. (1)

3.2.2 Explain ONE reason why no proteins are found in the filtrate. (2)

3.2.3 The table indicates that high levels sodium ions were excreted. Explain what causes the high sodium levels in the urine when levels are too high in the blood. (2)

3.2.4 Explain the condition that the patient most likely has, given the glucose levels in the table. (3)

3.3 The diagram below represents the human digestive system.



3.3.1 Provide a suitable label for parts:

(a) **A** (1)

(b) **D** (1)

(c) **F** (1)

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3.3.2 List TWO functions of the HCl produced in structure **B**. (2)

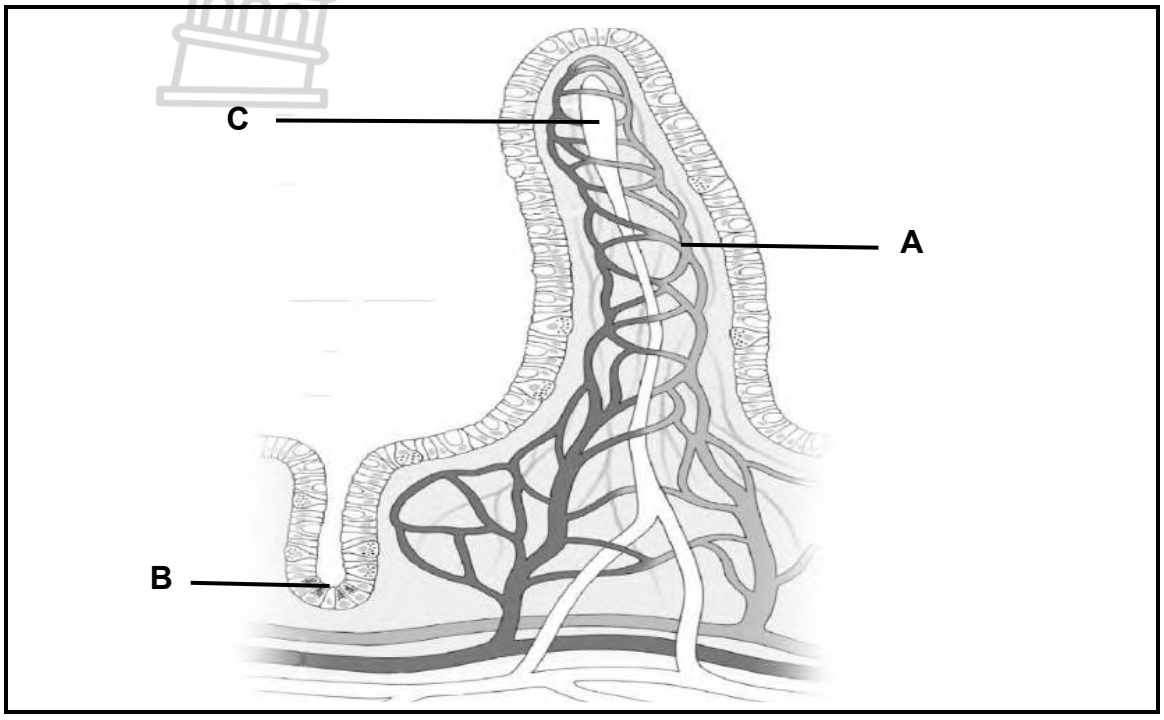
3.3.3 Explain TWO adaptations of part **E** for its effective functioning. (4)

3.3.4 Identify the structure that secretes bile. (1)

3.3.5 Describe ONE role bile serves as it enters the small intestine. (2)

3.3.6 Draw a line diagram of a cross-section through part **E**. (5)

3.4 The end products of digestion are monomers that are easily absorbed. Review the given line diagram of the villus and answer the questions that follow.



3.4.1 Give the NAME of the monomer(s) and give the LETTER where it is absorbed in the villus for each of the following macro-molecules:

(a) Lipids (2)

(b) Carbohydrate (2)

3.4.2 Due to Crohn's disease the villus in the small intestine becomes reduced in size and eventually flattened.

Briefly discuss how Crohn's disease will affect the nutrition and lifestyle of an individual. (4)

[50]

TOTAL SECTION B: 100
GRAND TOTAL: 150

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GRADE 11

NOVEMBER 2024

LIFE SCIENCES P1
FINAL AMENDED
MARKING GUIDELINE

MARKS: 150

This amended marking guideline consists of 13 pages.

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PRINCIPLES RELATED TO MARKING LIFE SCIENCES

1. **If more information than marks allocated is given**
   Stop marking when maximum marks is reached and put a wavy line and 'max' in the right-hand margin.

2. **If, for example, three reasons are required and five are given**
   Mark the first three irrespective of whether all or some are correct/incorrect.

3. **If whole process is given when only a part of it is required**
   Read all and credit the relevant part.

4. **If comparisons are asked for but descriptions are given**
   Accept if the differences/similarities are clear.

5. **If tabulation is required but paragraphs are given**
   Candidates will lose marks for not tabulating.

6. **If diagrams are given with annotations when descriptions are required**
   Candidates will lose marks.

7. **If flow charts are given instead of descriptions**
   Candidates will lose marks.

8. **If sequence is muddled and links do not make sense**
   Where sequence and links are correct, credit. Where sequence and links are incorrect, do not credit. If sequence and links become correct again, resume credit.

9. **Non-recognised abbreviations**
   Accept if first defined in answer. If not defined, do not credit the unrecognised abbreviation, but credit the rest of the answer if correct.

10. **Wrong numbering**
    If answer fits into the correct sequence of questions but the wrong number is given, it is acceptable.

11. **If language used changes the intended meaning**
    Do not accept.

12. **Spelling errors**
    If recognisable, accept the answer, provided it does not mean something else in Life Sciences or if it is out of context.

13. **If common names are given in terminology**
    Accept, provided it was accepted at the national memo discussion meeting.

14. **If only the letter is asked for but only the name is given (and vice versa)**
    Do not credit.

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15. **If units are not given in measurements**
Candidates will lose marks. Marking guideline will allocate marks for units separately.

16. **Be sensitive to the sense of an answer, which may be stated in a different way.**

17. **Caption**
All illustrations (diagrams, graphs, tables, etc.) must have a caption.

18. **Code-switching of official languages (terms and concepts)**
A single word or two that appear(s) in any official language other than the learners' assessment language used to the greatest extent in his/her answers should be credited if it is correct. A marker that is proficient in the relevant official language should be consulted. This is applicable to all official languages.

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SECTION A

QUESTION 1

1.1
1.1.1 D ✓✓
1.1.2 C ✓✓
1.1.3 B ✓✓
1.1.4 A ✓✓
1.1.5 A ✓✓
1.1.6 C ✓✓
1.1.7 A ✓✓
1.1.8 D ✓✓
1.1.9 C ✓✓ (9 x 2) (18)

1.2
1.2.1 Chloroplast ✓
1.2.2 Intercostal ✓ muscle
1.2.3 Ureter ✓
1.2.4 Alveoli ✓
1.2.5 (Palisade) mesophyll ✓ / chlorenchyma / Palisade parenchyma
1.2.6 Photolysis ✓
1.2.7 Pleural ✓ membrane / pleura
1.2.8 Oxygen ✓
1.2.9 Islets of Langerhans✓ (9 x 1) (9)

1.3
1.3.1 B ✓✓ only
1.3.2 B ONLY ✓✓
1.3.3 BOTH A and B ✓✓
1.3.4 BOTH A and B ✓✓ / B ONLY (4 x 2) (8)

1.4
1.4.1 Trachea ✓ (1)

1.4.2
- Part D/ diaphragm contracts ✓
- increasing the volume of the thoracic cavity ✓/ decreasing pressure in the thoracic cavity (2)

1.4.3
- The **sides** of the model is immovable ✓ / in the human chest the rib cage moves upwards and downwards/ model cannot show contraction and relaxation of intercostal muscles
- The **space** between the lungs and wall of the thorax is very small ✓ / the model shows a large space between the balloons and glass jar
- In the body there is **limited movement** of lungs ✓ / **pressure exerted** on lungs / in the model there is a lot is of space available for lungs to move / greater pressure is placed on balloons
- In the human body, the **diaphragm is dome-shaped** and flattensduring inhalation. ✓ / In the model, the rubber sheet is flat and is pulled down to represent inhalation
- Balloons are hollow/ one large sac / Lungs are not **hollow** / are made up of many small sacs
- Lungs are not the same **size**
- There is **no capillary network**/ transport system/ Human gaseous exchange system has transport system

Any (2)
(**Mark first TWO only**)

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1.5 1.5.1 (a) Bronchus ✓ (1)

(b) Rib ✓ (1)

1.5.2
- Well protected ✓
  The ribs and intercostal muscles protect the lungs from mechanical injury ✓
- Large surface area ✓
  Many alveoli are present that increase surface area for gaseous exchange to take place ✓
- Presence of a double pleural membrane
  provides protection against friction ✓
- Has ventilation mechanism✓/trachea and bronchi/breathing muscles(intercostal & diaphragm)
  allowing movement of air in and out✓

(Any 2 x 2) (4)

(Mark first TWO only)

1.5.3 (a) G ✓ – Larynx ✓ (2)

(b) A ✓ – Trachea ✓ / B ✓ - bronchus ✓ (2)

[50]

TOTAL SECTION A: 50

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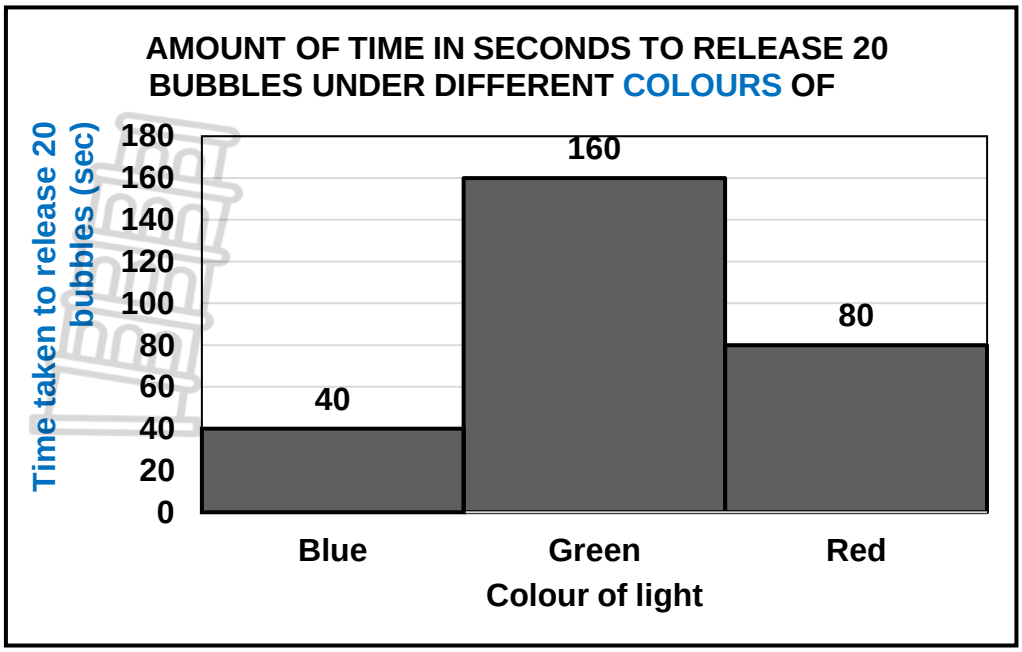
SECTION B

QUESTION 2

2.1 2.1.1



Criteria	Mark allocation
Correct type of graph (**T**)	✓
Caption of graph includes both variables (**C**)	✓
Correct scale for y-axis and equal width of bars (**S**)	✓
Correct labels on the x-axis and y-axis with correct unit on the y-axis **(L)**	✓
Plotting of bars correctly done for: (**P**) 1–2 bars All 3 bars	✓ ✓

(6)

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2.1.2
- Rate of oxygen bubble production indicates rate of photosynthesis ✓
- Photosynthesis is responsible for plant growth ✓/ accumulation of biomass

OR
- Oxygen bubble production indicates photosynthesis is occurring
- Photosynthesis is responsible for growth in plants (2)

2.1.3 Green : Red
160 : 80 20:20
2 : 1 ✓✓ Accept: 1: 1 ✓✓ (2)

2.1.4 Blue ✓ light (1)

2.2 2.2.1
- Space in the thoracic cavity would be limited ✓
- Due to abdominal organs pushing into the thoracic cavity ✓
- Limiting inhalation ✓ / the ability of the lungs to fully expand

OR

- The thoracic cavity is no longer a closed system ✓/ air will be pushed through the hole
- When the diaphragm contracts the thoracic cavity will not expand ✓/pressure will not decrease in the thoracic cavity
- And inhalation is limited✓/ less or no air will be drawn into the lungs (3)

2.2.2
- Due to difficulty in breathing ✓/damaged diaphragm
- Carbon dioxide in the blood increased ✓/will not be exhaled effectively
- Which was detected by (chemo) receptors of the aorta ✓/ carotid artery
- Which stimulated the Medulla Oblongata ✓
- to send impulses to heart muscle ✓
- to increase contraction the hearts muscle ✓ (5)

2.3 2.3.1 To determine if living organisms require oxygen for aerobic respiration ✓✓ (2)

2.3.2 (a) Oxygen ✓ uptake /aerobic respiration (1)

(b) Presence or absence of living organisms ✓ (1)

2.3.3 $\frac{28-13}{13}$ ✓ x 100 ✓

= 115,38% ✓ (3)

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2.3.4
- Both flasks have the same amount of sodium hydroxide solution ✓
- To ensure carbon dioxide absorption occurs equally in both flasks ✓

OR

- Both insect and glass beads have the same mass ✓
- Therefore starting positions have the same pressure ✓

OR

- The control has all the same conditions ✓
- except for the independent variable/ living organism ✓

OR

- Syringes contain same amount of air ✓
- to ensure both beads and insects receive the same amount of oxygen ✓

(Any 1 x 2) (2)

(Mark first ONE only)

2.4 2.4.1
- Pyruvate/ pyruvic acid is broken down ✓
- Releasing hydrogen ✓ atoms and
- carbon dioxide ✓
- in the presence of oxygen ✓
- Small amount of energy / ATP is released ✓

(Any 3 x 1) (3)

2.4.2
- In **animal cells** pyruvate/pyruvic acid is (partially) broken down into lactic ✓ acid
- due to lactic acid fermentation ✓
- In **plant cells** pyruvate/pyruvic acid is (partially) broken down into ethanol and carbon dioxide ✓
- due to alcoholic fermentation ✓

(4)

2.4.3
- Alcoholic fermentation can be used to form alcohol ✓ which can be sold for income ✓
- It can be used to make bread dough rise ✓ a greater volume of product is produced at a greater profit ✓

(Mark first TWO only) (2X2) (4)

2.4.4 Muscle cramps ✓ / spasms / fatigue (1)

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2.5 2.5.1
- Light ✓ intensity
- Temperature ✓
- Water ✓/ rainfall
- Humidity
- Windspeed

(Mark first TWO only) Any (2)

2.5.2
- (The light independent phase of) photosynthesis had been taking place ✓
- This phase uses carbon dioxide to produce glucose ✓ (2)

2.5.3
- Excess carbon dioxide would be a wasted expense ✓
- Plants cannot use any more Carbon dioxide as plants would not be able to absorb beyond a set maximum ✓/Chloroplasts could become saturated with carbon dioxide

OR

- Excess carbon dioxide could become toxic ✓ for plant growth
- May lead to the death of the plant ✓ (Any 1 x 2) (2)

2.5.4
- Cellular respiration ✓ would occur
- Glucose is broken down ✓
- in the presence of oxygen ✓
- Carbon dioxide would be released ✓

OR

- Cellular respiration ✓ would occur
- Carbon dioxide would be released ✓
- No photosynthesis would occur ✓ as there is no light
- No carbon dioxide is being absorbed ✓ (4)

[50]

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QUESTION 3

3.1 3.1.1 (a) C ✓ – Distal Convoluted Tubule ✓/ B - collecting duct (2)

(b) D ✓ – Ascending limb of Henle ✓ / loop of Henle (2)

3.1.2
- Capillary has microscopic pores ✓ only allowing smaller components of blood through ✓
- Dense capillary network ✓/ cup shaped Bowman's capsule Increasing surface area for filtration to occur ✓
- Afferent arteriole wider than efferent arteriole ✓ Placing blood under pressure within the glomerulus increasing filtration
- Podocytes lining of Bowman's capsule ✓ form filtration slits ✓
- Glomerulus in close contact to the Bowmans cavity ✓ reducing distance to be moved by ultrafiltrate ✓
- Thin endothelium (wall) that is semi-permeable ✓ for easy absorption/movement of substances ✓

(Mark first THREE only) **(**Any 3 x 2) (6)

3.1.3 (a)
- Active reabsorption ✓
- Energy/ATP produced by cuboidal epithelial cell used ✓/pulling of glucose against the concentration gradient (2)

(b)
- Passive reabsorption /osmosis ✓
- Water is moved from a region of high water potential to a region of low water potential ✓ (2)

3.1.4
- More ADH produced ✓ means
- They/B and C/distal convoluted tubules and collecting duct become more permeable ✓
- More water leaves the renal tubules ✓
- More water reabsorbed into the blood ✓/medulla Any (3)

3.2 3.2.1 Urea ✓ (1)

3.2.2
- Proteins are too large ✓
- To move through the pores of the glomerulus ✓ (2)

3.2.3
- Less Aldosterone ✓* will be secreted
- causing the renal tubule to become less permeable to Na^+ ✓
- less sodium ions will be reabsorbed ✓ from the filtrate Any (2)

3.2.4
- Diabetes ✓ mellitus
- High glucose level in the urine ✓
- Insulin is not being produced ✓/ is not effective, therefore no regulation (3)

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3.3 3.3.1 (a) Liver ✓ (1)

(b) Rectum ✓ (1)

(c) Gall bladder ✓ (1)

3.3.2
- Provides low pH / acidic conditions for enzymes to function ✓/ chemical digestion
- Kills bacteria ✓/ pathogenic microbes

(Mark first TWO only) (2)

3.3.3
- The small intestine is long ✓
  to increase the time/surface area for absorption of products ✓
- The walls of the small intestine are folded ✓
  to increase surface area of absorption ✓
- The inner wall of the small intestine has villi ✓
  to increase surface area of absorption ✓
- Each villus contains microvilli ✓
  to further increase the surface area for absorption ✓
- Good blood supply ✓
- to maintain gradient for nutrient absorption ✓

(Mark first TWO only) (Any 2 x 2) (4)

3.3.4 Liver ✓ / A (1)

3.3.5
- Emulsification of fats ✓ ✓
- Neutralisation of acidic chyme ✓ ✓

(Mark first ONE only) (Any 1 x 2) (2)

3.3.6 **Cross-section of the small intestine** Remove – Microscopic structure not in CAPS. Mark out of 145 and convert to 150 (5)

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3.4 3.4.1 (a)
- Glycerol and fatty acid tails ✓
- C ✓ (2)

(b)
- Glucose ✓ / monosaccharides
- A ✓ (2)

3.4.2 (a)
- Smaller surface area ✓
- For the ~~(re)~~absorption of nutrient monomers ✓
- Due to less nutrients/glucose/amino acids/glycerol and fatty acids present in the blood ✓ read in "takes longer time" to less nutrients
- The individual's body will not be able to sustain its nutritional needs ✓/respiration/ energy/ metabolism – read into it
- Person my get tired more often ✓/ has less energy
- Leading to health complications ✓ / disease / infections

(Any 4 x 1) (4)
[50]

TOTAL SECTION B: 100
GRAND TOTAL: 150

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