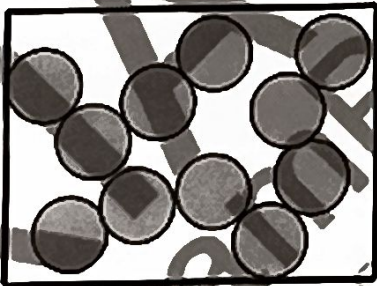


**ASSUMPTION ENGLISH SCHOOL**  
**Sec 2 Lower Secondary Science Marking Scheme**  
**End of Year Examination 2024**

**Section A (30 m)**

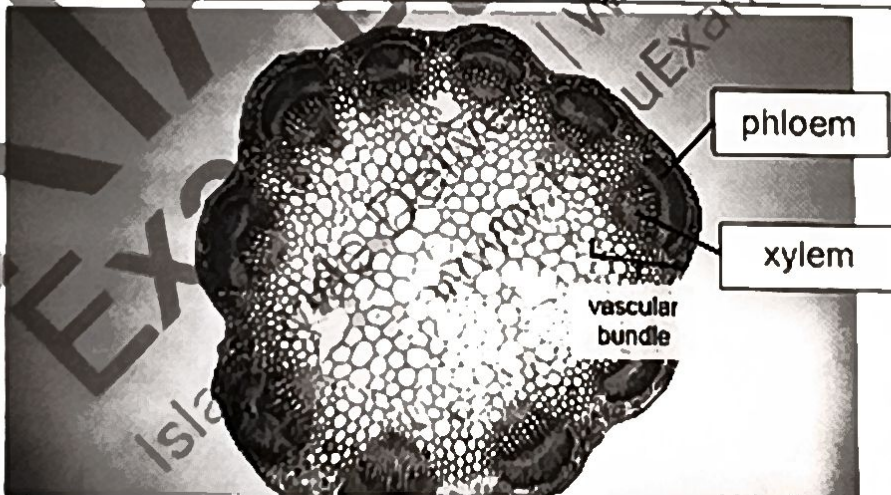
| Q1  | Q2  | Q3  | Q4  | Q5  | Q6  | Q7  | Q8  | Q9  | Q10 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| D   | C   | A   | C   | B   | C   | D   | C   | D   | B   |
| Q11 | Q12 | Q13 | Q14 | Q15 | Q16 | Q17 | Q18 | Q19 | Q20 |
| D   | A   | B   | C   | D   | C   | A   | B   | C   | A   |
| Q21 | Q22 | Q23 | Q24 | Q25 | Q26 | Q27 | Q28 | Q29 | Q30 |
| B   | C   | A   | A   | C   | D   | B   | D   | B   | B   |

**Section B (70 m)**

|   |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |   |
|---|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 1 | a   | R                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1 |
|   | b   | S                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1 |
|   | ci  | P and R                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1 |
|   | cii | Both particles have the <u>same number of protons and electrons.</u>                                                                                                                                                                                                                                                                                                                                                                                        | 1 |
|   | d   | False                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1 |
| 2 | a   | Substance A                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1 |
|   | bi  |  <ul style="list-style-type: none"> <li>• Must draw most particles touching each other</li> <li>• Fill <math>\frac{3}{4}</math> of the box showing particles of similar size</li> </ul>                                                                                                                                                                                  | 1 |
|   | bii | Arrangement: particles are <u>closely packed</u> in an <u>orderly manner</u> . [1]<br>Movement: particles <u>vibrate about their fixed positions</u> . [1]                                                                                                                                                                                                                                                                                                  | 2 |
| 3 | a   | <ul style="list-style-type: none"> <li>• <u>Add water to dissolve</u> substance X and Y. Stir the mixture well.</li> <li>• <u>Pour the mixture into a filter paper</u> fitted onto a conical flask.</li> <li>• Collect <u>substance X as a residue</u> and <u>substance Y as the filtrate</u>.</li> <li>• <u>Heat the filtrate to dryness</u> to obtain a dry sample of substance Y.</li> </ul> 4 pts – 3 m, 3 pts – 2m, 2 pts – 1 m, 0 to 1 pt - no marks; | 3 |
|   | b   | No. <u>Sugar is soluble / dissolves in water</u> and cannot be collected as a residue using filtration.                                                                                                                                                                                                                                                                                                                                                     | 1 |

|                  |        |                                                                                                                                                                                                                                         |               |        |            |        |                  |       |   |
|------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------|------------|--------|------------------|-------|---|
| 4                | a      | <ul style="list-style-type: none"> <li>Force is applied on an object</li> <li>Object moves in the direction of the applied force</li> </ul>                                                                                             | 1             |        |            |        |                  |       |   |
|                  |        | Either one- [1]                                                                                                                                                                                                                         | 1             |        |            |        |                  |       |   |
|                  | bi     | No work done.<br>The crate did not move in the direction of the force applied.                                                                                                                                                          | 1             |        |            |        |                  |       |   |
|                  | bii    | Work is done.<br>The crate moved in the direction of the force applied.                                                                                                                                                                 | 1             |        |            |        |                  |       |   |
|                  | ci     | Weight of fork-lift truck and driver = $m \times g$<br>= $(3000 + 80) \times 10$<br>= <u>30,800 N</u>                                                                                                                                   | 2             |        |            |        |                  |       |   |
|                  | cii    | Pressure exerted = Force/ Area<br>= $30800 / 600$ [1]<br>= <u>51.3 N/cm<sup>2</sup></u> [1]                                                                                                                                             | 2             |        |            |        |                  |       |   |
|                  | d      | Size A. It has a <u>larger contact area</u> and <u>exerts a lower pressure on the soft soil</u> while the weight of the truck remains constant. [1]<br>This reduces the likelihood of the truck <u>sinking into the soft soil</u> . [1] | 2             |        |            |        |                  |       |   |
| 5                | a      | Radiation                                                                                                                                                                                                                               | 1             |        |            |        |                  |       |   |
|                  | b      | Black is a <u>good absorber of radiant heat</u> which helps to absorb thermal energy from the sun faster and quicken the dehydration of the drying substance.<br><br>(Reject: good absorber of heat)                                    | 1             |        |            |        |                  |       |   |
|                  | c      | Air flows in from the bottom and is <u>heated up in the solar dryer</u> . It <u>expands</u> and becomes less dense. [1]<br><br>The <u>warm, less dense air rises</u> and leaves the solar dryer through the top. [1]                    | 2             |        |            |        |                  |       |   |
|                  | d      | It should be a <u>good thermal insulator</u> to <u>reduce thermal energy loss</u> to the surroundings and keep the interior of the solar dryer warm.<br>(Reject: prevent thermal energy loss)                                           | 1             |        |            |        |                  |       |   |
| 6                | a      | appropriate scale;<br>correct plots;<br>best-fit curve<br><br>Each point- [1]                                                                                                                                                           | 3             |        |            |        |                  |       |   |
|                  | b      | From student's graph (roughly 60 s)                                                                                                                                                                                                     | 1             |        |            |        |                  |       |   |
|                  | c      | Test: place a lighted splint in the path of the gas<br>Observation: lighted splint extinguishes with a <u>'pop' sound</u><br><br>Test- [1]; Observation- [1]                                                                            | 2             |        |            |        |                  |       |   |
|                  | d      | <table border="1"> <tr> <td>methyl orange</td> <td>yellow</td> </tr> <tr> <td>methyl red</td> <td>yellow</td> </tr> <tr> <td>bromothymol blue</td> <td>green</td> </tr> </table><br>(All must be correct to get 1m)                     | methyl orange | yellow | methyl red | yellow | bromothymol blue | green | 1 |
| methyl orange    | yellow |                                                                                                                                                                                                                                         |               |        |            |        |                  |       |   |
| methyl red       | yellow |                                                                                                                                                                                                                                         |               |        |            |        |                  |       |   |
| bromothymol blue | green  |                                                                                                                                                                                                                                         |               |        |            |        |                  |       |   |

|   |     |                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |
|---|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 7 | a   | Sun                                                                                                                                                                                                                                                                                                                                                                                                                             | 1   |
|   | b   | grasses → rabbit → hawk OR<br>grasses → mouse → hawk                                                                                                                                                                                                                                                                                                                                                                            | 1   |
|   | c   | One key Impact:<br><ul style="list-style-type: none"> <li>Decrease in snake population;</li> <li>Increase in cricket population</li> </ul> Explanation:<br><ul style="list-style-type: none"> <li>Decrease in snake population – <u>mouse is the only source of food for snakes;</u></li> <li>Increase in cricket population – <u>decrease in the number of predators for crickets</u></li> </ul> Impact- [1]; Explanation- [1] | 2   |
| 8 | a   | Correct drawing of:<br><ul style="list-style-type: none"> <li>Variable resistor</li> <li>Ammeter</li> <li>2 Cells</li> <li>Switch</li> <li>2 light bulbs</li> <li>Components connected in series</li> </ul> Every 3 bullet points- [1]; max mark- [2]                                                                                                                                                                           | 2   |
|   | b   | The variable resistor is <u>used to vary the current by adjusting the total/effective resistance of the circuit.</u> [1]<br>Changing the current allows us to <u>adjust the brightness of the lamps.</u> [1]                                                                                                                                                                                                                    | 2   |
|   | c   | Suitability: not suitable<br>Reason 1: <u>when one of the light bulbs blows/spoils, the other light bulb will no longer light up</u> [1]<br>Reason 2: <u>Brightness of the light bulb is low due to an overall higher resistance caused by the light bulbs being connected in series.</u><br>Also accept: <u>there is no control over individual light bulbs as there is only one switch in the entire circuit.</u>             | [2] |
| 9 | a   | X: $0.9 \times 8 = 7.2 \text{ kWh}$ [1]<br>Y: $1.1 \times 7 = 7.7 \text{ kWh}$ [1]<br>Hence, <u>household Y</u> consumed more energy. [1, allow ecf]                                                                                                                                                                                                                                                                            | 3   |
|   | bi  | Cost = energy x tariff<br>= $3323 \times 0.27$<br>= <u>\$ 897.21</u>                                                                                                                                                                                                                                                                                                                                                            | 1   |
|   | bii | <ul style="list-style-type: none"> <li>Switch off the air-con when not in use</li> <li>Keep the room door closed when air con is switched on</li> </ul> Accept any other reasonable answers                                                                                                                                                                                                                                     | 1   |

|    |     |                                                                                                                                                                                                                                                                                                                                                                   |                        |                                                   |                             |   |
|----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------------------------------------|-----------------------------|---|
| 10 | a   | food                                                                                                                                                                                                                                                                                                                                                              | main class of nutrient | region of alimentary canal where digestion begins | final products of digestion | 2 |
|    |     | fried chicken                                                                                                                                                                                                                                                                                                                                                     | protein                | stomach                                           | amino acids                 |   |
|    |     | fries                                                                                                                                                                                                                                                                                                                                                             | carbohydrates          | mouth                                             | glucose                     |   |
|    |     | Every 2 correct answers- [1]                                                                                                                                                                                                                                                                                                                                      |                        |                                                   |                             |   |
|    | bi  | K: gullet/ oesophagus<br>L: small intestine/ duodenum                                                                                                                                                                                                                                                                                                             |                        |                                                   |                             | 1 |
|    | bii | <p>In the stomach, both fried chicken and fries are <u>churned and broken up into even smaller pieces</u>. [1]</p> <p>The protein (from chicken) is <u>partially digested/ broken down by proteases</u> into partially digested proteins. [1]</p> <p><u>Carbohydrates (from fries) are not digested/ broken down by digestive enzymes</u> in the stomach. [1]</p> |                        |                                                   |                             | 3 |
| 11 | ai  | <p>Water moves from <u>a region of higher concentration/ water potential in the soil to a region of lower concentration/ water potential in the root hair cells</u> [1]</p> <p>by osmosis [1]</p>                                                                                                                                                                 |                        |                                                   |                             | 2 |
|    | aii | <p>The <u>threadlike roots increases the surface area</u> for quicker absorption of water and mineral salts.<br/>(reject: absorb more water &amp; mineral salts)</p>                                                                                                                                                                                              |                        |                                                   |                             | 1 |
|    | bi  |                                                                                                                                                                                                                                                                               |                        |                                                   |                             | 1 |
|    | bii | <p>during <u>photosynthesis</u>, <u>glucose/ food</u> is <u>transported up and down from the leaves</u> to the roots and all parts of the plant; [1]</p> <p>When there is <u>no photosynthesis/ little sunlight</u>, <u>glucose/ food</u> from the storage <u>roots</u> is <u>transported up</u> to the other parts of the plants. [1]</p>                        |                        |                                                   |                             | 2 |

|    |      |                                                                                                                                                                                                                                |   |
|----|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 12 | a    | It is the process in which the <u>broken-down uterine lining</u> , along with the unfertilized egg (and blood tissues) are <u>discharged</u> through the vagina.                                                               | 1 |
|    | bi   | 16 August 2023                                                                                                                                                                                                                 | 1 |
|    | bii  | 12 August-17 August 2023                                                                                                                                                                                                       | 1 |
|    | c    | The sperm can survive up to 3-5 days in the female reproductive system to fertilise an egg released on the day of ovulation.<br><b>OR</b><br>An egg is able to survive for about a day after it is released from an ovary.     | 1 |
|    | di   | Birth control pills prevent fertilisation by disrupting the release of eggs from the ovaries / disrupting ovulation [1]<br>Ligation prevents fertilisation by preventing egg from reaching the oviducts / fallopian tubes. [1] | 2 |
|    | dii  | Birth control pills. [1]<br>It is more suitable as it is a <u>temporary birth control method</u> , allowing her to still have a baby after 3 years. [1]                                                                        | 2 |
|    | diii | The statement made is <u>incorrect</u> . [1]<br>Most birth control methods <u>do not prevent the exchange of body fluids</u> , hence allowing STIs to be transmitted during sexual intercourse. [1]                            | 2 |

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