

| Question                  | Marking details  | Marks Available |
|---------------------------|--|-----------------|
| 6/1 (a)                   | (i) A line drawn <b>outside</b> cell membrane;<br>Nucleus, vacuole & chloroplasts (not dots) (all needed) correctly drawn;<br>Must be able to distinguish the three different organelles | 2               |
|                           | (ii) <u>{Controls/regulates/selects}</u> {the movement of substances /what}<br>into <u>and</u> out of cell;<br><i>NOT protect cell/maintain shape</i>                                    | 1               |
| (b)                       | (i) I Into the cell ✓;<br><br>II Into the cell ✓;<br><br>III Cell B ✓;   | 3               |
|                           | (ii) Diffusion;  | 1               |
| <b>Question 6/1 Total</b> |  | <b>[7]</b>      |

| Question                  | Marking details   | Marks Available |
|---------------------------|---|-----------------|
| 7/2 (a)                   | (i) Greater;  | 1               |
|                           | (ii) Less;  | 1               |
|                           | (iii) Greater;  | 1               |
|                           | (iv) Less;  | 1               |
| (b)                       | <p>Any <b>two</b> from</p> <p>Answers must compare bell jar and human</p> <p>The {diaphragm/rubber sheet} in bell jar model is pulled down during inspiration, whereas in the thorax the diaphragm is flattened. (OWTTE);</p> <p>The (wall of the) bell jar is {rigid/does not move}, whereas (the wall of the) {thorax/chest/ribs/ribcage} is {flexible/moves} (and moves during breathing). (OWTTE);</p> <p>Accept {thorax/ ribcage} expands <i>NOT ribs expand</i></p> <p>The bell jar cavity is filled with air, whereas the thoracic wall is filled with body fluid. (OWTTE);</p> <p>In the bell jar there's a large space around the 'lungs'/balloons in the thorax the space is very small. (OWTTE);</p> | 2               |
| <b>Question 7/2 total</b> |   | <b>[6]</b>      |

| Question | Marking details  | Marks Available |
|----------|--|-----------------|
| 8/3 (a)  | Place the quadrats randomly within the sample area;  | 1               |
| (b)      | (i) Mean = 6.2;  | 1               |
|          | (ii) Estimated no of lugworms = $6.2 \times 3200$ ;<br>= 19 840;<br>Allow ECF from (b)(i)<br>(If answer is correct award 2 marks directly)   | 2               |
| (c)      | Any ref to evidence not available on surface (to count)/hidden by grass/ {casts/holes/burrows} are <u>hidden by the grass</u> /<br>earthworms move/ earthworms do not stay in one burrow/<br>Accept ref to 3D aspect of population of earthworms ie there can be many earthworms at the same vertical point in the soil; | 1               |
|          | <b>Question 8/3 total</b>  | <b>[5]</b>      |

| Question | Marking details   | Marks Available |
|----------|---|-----------------|
| 9/4      | <p><i>Indicative content:</i></p> <p>Drop leaf in boiling <u>water</u> to {kill the leaf/ burst the chloroplasts/ {burst/destroy} cell membranes/ to get rid of waxy cuticle}</p> <p>Boil the leaf in ethanol/alcohol/methanol to remove the <u>chlorophyll</u></p> <p>Place the leaf in water to soften it</p> <p>Spread the leaf on a white tile (or any suitable surface)</p> <p>Add iodine solution to the leaf surface to test for starch</p> <p>If <u>leaf</u> turns {blue-black/ black} starch is present</p> <p>5 – 6 marks<br/>The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</p> <p>3 – 4 marks<br/>The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</p> <p>1 – 2 marks<br/>The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</p> <p>0 marks<br/>The candidate does not make any attempt or give a relevant answer worthy of credit.</p> <p><b>Question 9/4 Total</b></p> | 6               |
|          |   | <b>[6]</b>      |

| Question                | Marking details  | Marks Available |
|-------------------------|--|-----------------|
| 5 (a)                   | Lipase {digests/ breaks down/hydrolyses} <u>fat</u> (in milk) to fatty acids (and glycerol);<br>Fatty acids {decrease pH/ cause it to become acid};<br>2 <sup>nd</sup> mark only given if 1 <sup>st</sup> mark awarded   | 2               |
| (b) (i)                 | 0.135;   | 1               |
| (b) (ii)                | Bile breaks large globules of fat into smaller globules/ bile emulsifies fat;<br>(accept 'pieces', 'chunks', lumps' of fat but <i>NOT molecules</i> )<br>Increasing the surface area for (the action of) {lipase/ enzyme};<br>More fatty acids produced/ fatty acids produced faster;<br>3 <sup>rd</sup> mark only awarded if 2 <sup>nd</sup> mark awarded | 3               |
| <b>Question 5 Total</b> |  | <b>[6]</b>      |

| Question                | Marking details   | Marks Available |   |                 |   |     |   |     |   |     |   |     |   |       |
|-------------------------|---|-----------------|---|-----------------|---|-----|---|-----|---|-----|---|-----|---|-------|
| 6                       | (a) (i) 2;  | 1               |   |                 |   |     |   |     |   |     |   |     |   |       |
|                         | (ii) 4;   | 1               |   |                 |   |     |   |     |   |     |   |     |   |       |
|                         | (iii) 3;  | 1               |   |                 |   |     |   |     |   |     |   |     |   |       |
| (b)                     | <table border="1"> <tbody> <tr> <td>1st</td> <td>F</td> </tr> <tr> <td>2<sup>nd</sup></td> <td>E</td> </tr> <tr> <td>3rd</td> <td>D</td> </tr> <tr> <td>4th</td> <td>C</td> </tr> <tr> <td>5th</td> <td>A</td> </tr> <tr> <td>6th</td> <td>B</td> </tr> </tbody> </table> <p>4 or 5 correct = 4 marks<br/> 3 correct = 3 marks<br/> 2 correct = 2 marks<br/> 1 correct = 1 mark</p> | 1st             | F | 2 <sup>nd</sup> | E | 3rd | D | 4th | C | 5th | A | 6th | B | Max 4 |
| 1st                     | F   |                 |   |                 |   |     |   |     |   |     |   |     |   |       |
| 2 <sup>nd</sup>         | E   |                 |   |                 |   |     |   |     |   |     |   |     |   |       |
| 3rd                     | D   |                 |   |                 |   |     |   |     |   |     |   |     |   |       |
| 4th                     | C   |                 |   |                 |   |     |   |     |   |     |   |     |   |       |
| 5th                     | A   |                 |   |                 |   |     |   |     |   |     |   |     |   |       |
| 6th                     | B   |                 |   |                 |   |     |   |     |   |     |   |     |   |       |
| (c)                     | (i) 22;   | 1               |   |                 |   |     |   |     |   |     |   |     |   |       |
|                         | (ii) 9;   | 1               |   |                 |   |     |   |     |   |     |   |     |   |       |
| <b>Question 6 total</b> |   | <b>[9]</b>      |   |                 |   |     |   |     |   |     |   |     |   |       |

| Question | Marking details   | Marks Available |
|----------|---|-----------------|
| 7 (a)    | (i) (Rate of) uptake of iodine decreased;<br>to zero;<br>No effect on uptake of water;  | 3               |
|          | (ii) (Process of) {active transport/ active uptake};<br>Requires energy;<br>Energy release from respiration is stopped (by chemical); | 3               |
| (b)      | Osmosis;  | 1               |
|          | <b>Question 7 total</b>   | <b>[7]</b>      |

| Question                | Marking details   | Marks Available |
|-------------------------|---|-----------------|
| 8                       | (a) (i) Adenine<br>Thymine<br>Cytosine<br>Guanine<br>-1 for each error  | 2               |
|                         | (ii) Amino acids;   | 1               |
|                         | (b) Mitosis;<br>results in <u>genetically</u> identical cells/ same {chromosome/<br>genes};<br>NOT similar  | 2               |
|                         | (c) Liver because it has the <u>most</u> active genes;<br>Genes control protein production;<br>Enzymes are proteins;<br>3 <sup>rd</sup> mark only awarded if 2 <sup>nd</sup> mark awarded | 3               |
| <b>Question 8 Total</b> |   | <b>[8]</b>      |



| Question | Marking details   | Marks Available |
|----------|---|-----------------|
| 9        | <p>Indicative content</p> <p>Correct explanation for concentrations e.g.</p> <ul style="list-style-type: none"> <li>• 0.0% - water passes in from where it is in high concentration/ water potential to where it is in low concentration/ water potential via Semi Permeable Membrane</li> <li>• 0.9% - water passes in and out at the same rate.</li> <li>• 3.0% - correct explanation for decrease in size i.e. opposite to explanation for 0.0%.</li> <li>• A correct comment on bursting or shrivelling i.e. at extremes of concentration range - membrane is affected.</li> </ul> <p>Top band must have correct explanation for the three concentrations.</p> <p>5 – 6 marks<br/>The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</p> <p>3 – 4 marks<br/>The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</p> <p>1 – 2 marks<br/>The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</p> <p>0 marks<br/>The candidate does not make any attempt or give a relevant answer worthy of credit.</p> <p><b>Question 9 Total</b></p> | 6               |
|          |   | <b>[6]</b>      |