

Question Number	Answer	Additional Guidance	Mark
5(a)(i)	<p>An explanation that makes reference to the following:</p> <ul style="list-style-type: none"> • same {age / type} of onion (1) • increases {repeatability / validity} (1) <p>OR</p> <ul style="list-style-type: none"> • smaller concentration intervals (1) • increasing {confidence in / validity of} conclusion (1) <p>OR</p> <ul style="list-style-type: none"> • same {temperature / surface area of onion} (1) • due to effect on osmosis (1) 		(2)

Question Number	Answer	Additional Guidance	Mark
5(a)(ii)	<ul style="list-style-type: none"> <li>• correct calculation of numerator (1) <li>• correct calculation of standard deviation (1) 	<p><u>Example of calculation</u></p> $\sum(x - \bar{x})^2 = 3.41$ $(3.2 - 4.6)^2 + (4.7 - 4.6)^2 + (5.8 - 4.6)^2$ $\sqrt{\frac{3.41}{2}} =$ <p>1.3 / 1.31 / 1.306 / 1.3057</p> <p>Correct answer no working scores full marks</p> <p>ALLOW ECF if number other than 3.41 calculated</p>	(2)

Question Number	Answer	Additional Guidance	Mark
5(a)(iii)	<p>An answer which makes reference to three of the following:</p> <ul style="list-style-type: none"> • 2.5% (sodium chloride solution) resulted in an increase in mass (1) • an increase (in sodium chloride solution) from 5% to {15% / 20%} resulted in a loss in mass (1) • because of the movement of water by osmosis (1) • (SD) values overlap for {5% and 10% / 10% and 15% / 10% and 20% / 15% and 20%} (sodium chloride solution) therefore no (significant) difference (1) 		(3)

Question Number	Answer	Additional Guidance	Mark
5(b)	<p>An explanation which includes the following:</p> <ul style="list-style-type: none"> • increased permeability of (cell surface) membrane (1) <p>plus two of the following</p> <ul style="list-style-type: none"> • the low pH would {change the shape of / denature} proteins (in cell surface membrane) (1) • (as vinegar) affects bonds (in protein) (1) • (vinegar / ethanoic acid) could dissolve lipids (in the cell membrane) (1) 	<p>ALLOW tonoplast</p> <p>ALLOW change in pH / acidic conditions would {change the shape of / denature} proteins</p>	(3)