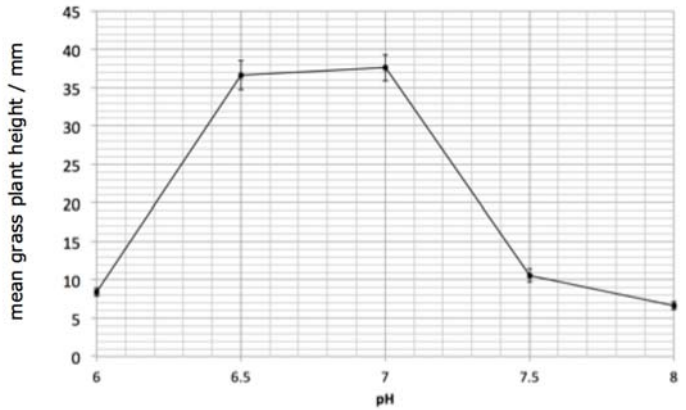


Question Number	Answer	Additional Guidance	Mark
1(a)(i)	pH	ACCEPT if pH appears <i>anywhere</i> in the answer	(1)

Question Number	Answer	Additional Guidance	Mark
1(a)(ii)	<ol style="list-style-type: none"> 1. temperature ; 2. temperature controlled room / growth chamber / thermostatically controlled water bath / incubator / eq ; 3. light intensity ; 4. use same bulb / same distance from bulb / light bank / same windowsill / eq ; 5. humidity ; 6. air conditioned room / eq ; 7. {soil in pots / minerals} ; 8. use compost from same bag / eq / add equal volumes of mineral (solutions) to each pot / eq ; 9. {age / storage conditions / genotype / size} of seeds ; 10. seeds from same {packet / plant / eq} / {weigh / measure seeds} / eq ; 11. depth of planting / space between seeds ; 12. same depth of soil above seeds / measure distance between seeds / eq ; 		(4)

Question Number	Answer	Additional Guidance	Mark
1(b)(i)	<p>A axes right way round (x = pH y=mean grass plant height) and a suitable linear scale which uses minimum half the graph paper ;</p> <p>L axes correctly labelled, and with units ; (x = pH y= mean (grass) plant height / mm) ;</p> <p>P correct plotting of means ;</p> <p>S line joining points accurately ruled and not extrapolated ;</p> <p>V SDs shown correctly on all points ;</p>	<p>e.g.</p>  <p>Accept a smooth curve that goes through the points S unavailable if a bar chart only plotted</p>	(5)

Question Number	Answer	Additional Guidance	Mark
1 (b) (ii)	<ol style="list-style-type: none"> 1. quantitative comparison of the mean heights at pH 6.5 and / or 7.0 with the mean heights at other pH values / quantitative comparison of the mean heights at pH 6.5 and 7.0 (only) 1 (mm); 2. the {SDs / error bars} for 6.5 and / or 7.0 do not overlap with those of {6.0 / 7.5 / 8.0} ; 3. idea that this difference is significant ; 4. the SDs of 6.5 and 7.0 overlap ; 	<p>1 6.5 26 mm taller than 7.5 30 mm taller than 8.0 28.2 mm taller than 6.0</p> <p>7.0 27 mm taller than 7.5 31 mm taller than 8.0 29.2 mm taller than 6.0</p> <p>ACCEPT a number of times taller or shorter if correct</p>	(3)

Question Number	Answer	Additional Guidance	Mark
1 (c) (i)	<ol style="list-style-type: none"> 1. {highest / most} growth occurred at pH 6.5 and / or 7.0 / eq ; 2. idea that (all) mineral ions are most available (at pH 6.5 and/or 7.0) ; 3. below pH 6.5 {phosphate / calcium / magnesium} limit the growth ; 4. above pH 7.0 another factor limits the growth ; 	<p>ACCEPT Greatest height</p>	(4)

Question Number	Answer	Additional Guidance	Mark
1(c)(ii)	1. nitrates are needed for {proteins / amino acids / DNA / RNA / nucleic acids / ATP / eq} ; 2. magnesium is needed for chlorophyll / eq ; 3. calcium is needed for the {middle lamella / calcium pectate / pectin / eq} ;	4. phosphate needed for {ATP / DNA / RNA / eq} ; 5. potassium needed for {enzyme activation / the stomatal mechanism / eq} ; 6. sulfate needed for {proteins / amino acids / eq} ;	(3)

Question Number	Answer	Additional Guidance	Mark
2(a)(i)	1. Ebola qualified ;	e.g. high mortality, incurable, no vaccine, highly contagious	(1)

Question Number	Answer	Additional Guidance	Mark
2(a)(ii)	1. main solution involves (injecting) ZMapp ; 2. (antibodies / ZMapp) { neutralise(s) / block(s) / eq} the virus ; 3. alternative involves giving blood transfusion from (Ebola) survivor ; 4. which contains antibodies ;		(4)

Question Number	Answer	Additional Guidance	Mark
2(b)	through broken skin / from {body fluids / named example} / direct contact / sexual transmission ;	DO NOT ACCEPT object contaminated with the virus unqualified.	(1)

Question Number	Answer	Additional Guidance	Mark
2(c)	<ol style="list-style-type: none"> {arrows / lines} shown at 3, 4 and 5 days (as a minimum) ; labelled A, B and C ; ZMapp dose identified as 50 mg kg^{-1} ; days 14, 21 and 28 identified as {sample days / temperature / clinical scores} ; 	<p>e.g.</p>	(4)

Question Number	Answer	Additional Guidance	Mark
2(d)	<ol style="list-style-type: none"> volume (number) ; article title / eq ; {part / issue} (number) ; names of co-authors ; page/s ; 	IGNORE wrong answers	(3)

Question Number	Answer	Additional Guidance	Mark
2(e)	1. idea of using experimental animals ; 2. idea of (informed) consent needed from human blood donors / recipient ; 3. (religious) issues about {donating / receiving} blood for some people ; 4. idea of treatment of patients with {experimental / eq} {transfusions / ZMapp} ; 5. risk of infections from blood transfusion ;	ACCEPT drug / medicine	(3)

Question Number	Answer	Additional Guidance	Mark
2(f)(i)	1. $2758 \div 9446$; 2. $\times 100 = 29$	2. ACCEPT 29.2 / 29.197.....	(2)

Question Number	Answer	Additional Guidance	Mark																
2(f)(ii)	1. table format with complete row and column headings including {percentage / %} ; 2. all data entered correctly, Sierra Leone 29 ;	<p>Do not accept % if only in cells of table</p> <p>ACCEPT ecf from 2fi</p> <p>e.g.</p> <table border="1"> <thead> <tr> <th>country</th> <th>(number) infected</th> <th>(number) who died</th> <th>mortality (rate) / %</th> </tr> </thead> <tbody> <tr> <td>Guinea</td> <td>2806</td> <td>1814</td> <td>65</td> </tr> <tr> <td>Liberia</td> <td>8331</td> <td>3538</td> <td>43</td> </tr> <tr> <td>Sierra Leone</td> <td>9446</td> <td>2758</td> <td>29</td> </tr> </tbody> </table>	country	(number) infected	(number) who died	mortality (rate) / %	Guinea	2806	1814	65	Liberia	8331	3538	43	Sierra Leone	9446	2758	29	(2)
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