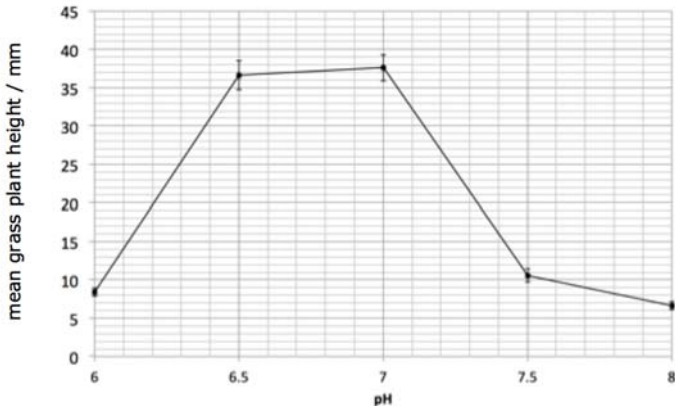


Question Number	Answer	Additional Guidance	Mark
1(a)(i)	pH	ACCEPT if pH appears <i>anywhere</i> in the answer	(1)

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

Question Number	Answer	Additional Guidance	Mark
1(b)(ii)	- 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); - the {SDs / error bars} for 6.5 and / or 7.0 do not overlap with those of {6.0 / 7.5 / 8.0} ; - idea that this difference is significant ; - the SDs of 6.5 and 7.0 overlap ;	1 6.5 26 mm taller than 7.5 30 mm taller than 8.0 28.2 mm taller than 6.0 7.0 27 mm taller than 7.5 31 mm taller than 8.0 29.2 mm taller than 6.0 ACCEPT a number of times taller or shorter if correct	(3)

Question Number	Answer	Additional Guidance	Mark
1(c)(i)	{highest / most} growth occurred at pH 6.5 and / or 7.0 / eq ; - idea that (all) mineral ions are most available (at pH 6.5 and/or 7.0) ; - below pH 6.5 {phosphate / calcium / magnesium} limit the growth ; - above pH 7.0 another factor limits the growth ;	ACCEPT Greatest height	(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)	{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} ;	e.g.	(4)

Question Number	Answer	Additional Guidance	Mark
2(d)	- 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 ;	Do not accept % if only in cells of table ACCEPT ecf from 2fi e.g.				(2)
		country	(number) infected	(number) who died	mortality (rate) / %	
		Guinea	2806	1814	65	
		Liberia	8331	3538	43	
		Sierra Leone	9446	2758	29	

