

Question		Answer	Marks	AO element	Guidance
17	(a)	<p>1 (gibberellin is) a chemical messenger ✓</p> <p>2 produced in one part of plant but has effects in another part / AW ✓</p> <p>3 affects activity / AW , of target , cells / tissues ✓</p> <p>4 long-lasting / acts over long period of time ✓</p> <p>5 wide-spread effect ✓</p>	3 max	AO1.2 AO2.1	<p>IGNORE functions of gibberellin</p> <p>ALLOW cell-signalling molecule</p> <p>e.g. causes activity of target cells to be altered</p> <p>e.g. causes response in target cells</p>

	(b)	(i)	4	AO3.2	<table border="1"> <thead> <tr> <th>Volume of gibberellin applied ($10^{-3} \text{ cm}^3 \text{ kg}^{-1} \text{ day}^{-1}$)</th> <th>Rate of increase of internodal length (mm day^{-1})</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>1</td></tr> <tr><td>0.2</td><td>1</td></tr> <tr><td>0.4</td><td>2</td></tr> <tr><td>0.6</td><td>4</td></tr> <tr><td>0.9</td><td>22</td></tr> <tr><td>1.2</td><td>47</td></tr> <tr><td>1.4</td><td>48</td></tr> <tr><td>1.8</td><td>49</td></tr> <tr><td>1.9</td><td>50</td></tr> <tr><td>2.0</td><td>50</td></tr> </tbody> </table> <p>IGNORE extrapolations</p> <p>Units must be given for both axes</p> <p>ALLOW solidus i.e. / for brackets ()</p> <p>NOTE () or / should be seen at least once</p> <p>NOTE non-linear x axis data</p> <p>ALLOW one error in plotting</p> <p>ALLOW ECF if non-linear scale used</p> <p>DO NOT ALLOW ruled lines between points</p>	Volume of gibberellin applied ($10^{-3} \text{ cm}^3 \text{ kg}^{-1} \text{ day}^{-1}$)	Rate of increase of internodal length (mm day^{-1})	0.0	1	0.2	1	0.4	2	0.6	4	0.9	22	1.2	47	1.4	48	1.8	49	1.9	50	2.0	50
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		<p>x (horizontal) axis labelled volume of gibberellin applied ($\times 10^{-3} \text{ cm}^3 \text{ kg}^{-1} \text{ day}^{-1}$)</p> <p>AND y (vertical) axis labelled rate of internodal length increase (mm day^{-1}) ✓</p> <p>linear scale on both axes AND at least 50% of area covered ✓</p> <p>line graph AND points plotted accurately to ± 1 small square ✓</p> <p>suitable curved line of best fit drawn ✓</p>																									

	(b)	(ii)	Any one from seed germination flowering in long-day plants cellular , transcription / translation prevents leaf abscission aids stomatal opening promotes fruit development promotes , activity of amylase / hydrolysis of starch ✓			1 max	AO1.2																			
	(c)	(i)	non-reducing , sugars / disaccharides ✓			1	AO3.2	ALLOW sucrose / cellulose / vitamins IGNORE minerals / ions / fibre																		
	(c)	(ii)	<table border="1"> <thead> <tr> <th>Test tube</th> <th>Observations</th> <th>Conclusion</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>(pale) purple / lilac / violet / mauve</td> <td>Protein present</td> </tr> <tr> <td>2</td> <td>Yellow colour</td> <td>reducing sugar (present)</td> </tr> <tr> <td>3</td> <td>Pale brown colour</td> <td>no / very little , starch (present)</td> </tr> <tr> <td>4</td> <td>(turns) white / cloudy / milky OR (forms white) suspension / emulsion</td> <td>Fat present</td> </tr> <tr> <td>5</td> <td><u>pink</u></td> <td>Glucose content small (15 mg dl⁻¹)</td> </tr> </tbody> </table>			Test tube	Observations	Conclusion	1	(pale) purple / lilac / violet / mauve	Protein present	2	Yellow colour	reducing sugar (present)	3	Pale brown colour	no / very little , starch (present)	4	(turns) white / cloudy / milky OR (forms white) suspension / emulsion	Fat present	5	<u>pink</u>	Glucose content small (15 mg dl ⁻¹)	2	AO3.2	1 mark per correct column IGNORE monosaccharides DO NOT ALLOW precipitate IGNORE any qualifications / shades of colour
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	(c)	(iii)	(result using colorimeter will be) <u>quantitative</u> OR not subjective / less affected by human error / no bias ✓	1	AO3.4	IGNORE accurate / valid ALLOW is objective
			Total	12		