

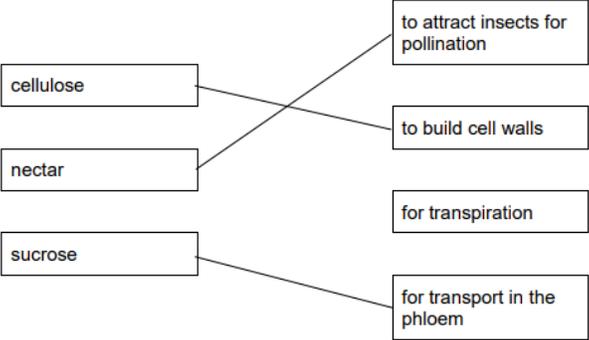
# 4. Biological molecules

## 4.1 Biological molecules

### Paper 3 and 4

Marking Scheme

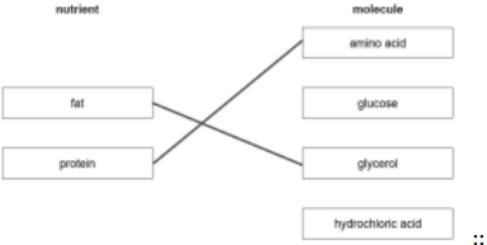
**Q1.**

(b)	<p>any three from:                  it / the white part of the leaf, cannot <u>photosynthesise</u> ;                  no <u>glucose</u> is produced ;  <u>glucose</u> is stored as starch ;                  iodine solution remains yellow-brown in the absence of <u>starch</u> / the white part does not contain <u>starch</u> / negative result for <u>starch</u> / AW ;</p>	3	
(c)	<p>yellow-brown ;                  yellow-brown ;</p>	2	
(d)(i)	 <pre>                 graph LR                 subgraph Nutrients                 C[cellulose]                 N[nectar]                 S[sucrose]                 end                 subgraph Functions                 F1[to attract insects for pollination]                 F2[to build cell walls]                 F3[for transpiration]                 F4[for transport in the phloem]                 end                 C --- F1                 C --- F2                 N --- F1                 S --- F4                 </pre>	3	R each additional line
(d)(ii)	<p>carbon, hydrogen, oxygen ;</p>	1	any order R each additional element

**Q2.**

(d)	<p>any two from:                  oxygen ;                  hydrogen ;                  nitrogen ;</p>	2	
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**Q3.**

(b)	 <pre>                 graph LR                 subgraph Nutrients                 F[fat]                 P[protein]                 end                 subgraph Molecules                 A[amino acid]                 G[glucose]                 Y[glycerol]                 H[hydrochloric acid]                 end                 F --- Y                 P --- A                 </pre>	2	one mark for each correct line R each additional line
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## Q4.

(c)(i)	starch ; cellulose ;	2					
(c)(ii)	<table border="1"> <thead> <tr> <th>glucose</th> <th>protein</th> </tr> </thead> <tbody> <tr> <td>carbon hydrogen oxygen ;</td> <td>carbon hydrogen oxygen nitrogen ;</td> </tr> </tbody> </table>	glucose	protein	carbon hydrogen oxygen ;	carbon hydrogen oxygen nitrogen ;	2	one mark for correct elements in glucose one mark for correct elements in protein <b>R</b> additional elements in each list
glucose	protein						
carbon hydrogen oxygen ;	carbon hydrogen oxygen nitrogen ;						

## Q5.

(a)(i)	carbon, hydrogen, oxygen ;	1	
(a)(ii)	nitrogen ;	1	

## Q6.

(c)	<table border="1"> <thead> <tr> <th>large molecule</th> <th>sentence endings</th> </tr> </thead> <tbody> <tr> <td>Cellulose</td> <td>is made from amino acids.</td> </tr> <tr> <td>DNA</td> <td>is made from fatty acids and glycerol.</td> </tr> <tr> <td>Glycogen</td> <td>is made from glucose.</td> </tr> <tr> <td>Oil</td> <td>is the genetic material.</td> </tr> <tr> <td>Protein</td> <td></td> </tr> </tbody> </table>	large molecule	sentence endings	Cellulose	is made from amino acids.	DNA	is made from fatty acids and glycerol.	Glycogen	is made from glucose.	Oil	is the genetic material.	Protein		5	one mark for each correct line <b>R</b> each additional line
large molecule	sentence endings														
Cellulose	is made from amino acids.														
DNA	is made from fatty acids and glycerol.														
Glycogen	is made from glucose.														
Oil	is the genetic material.														
Protein															

Q7.

(c)	CHO; N;	2	
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Q8.

	carbon ; oxygen ; nitrogen ; carbohydrate ; glycogen ; starch ; cellulose ;	7	carbon and oxygen in either order
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Q9.

(e)	<i>any two from:</i> transport (of ions / sucrose / AW) / translocation ; as a reactant / (used in) photosynthesis ; as a solvent / substances dissolve in it ; medium for, chemical / enzyme / metabolic, reactions ; support / (maintaining) turgidity (of cells) / (maintaining) turgor pressure / prevent wilting ; AVP ;	2	e.g. cooling / temperature regulation / germination / elongation of cells (in growth)
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Q10.

(a)	<i>any four from:</i> two strands ; formed into (double) helix ; ref. to four bases / A and T and C and G ; pairing of, A with T / C with G ; cross links between bases ;	4	A as an annotated drawing
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