

**WJEC (Eduqas) Biology A-level**  
**Core Concept 1: Biological**  
**Compounds**  
**Questions by Topic - Mark**  
**Scheme**

1. (a)

(i)

$\alpha$  glucose OH on C1 down, H up +  $\beta$  glucose OH on C1 up, H down; Allow HO (both for 1 mark). 1

(b)

(i)

Cellulose -Beta Starch - alpha; (both for 1 mark). 1

Allow symbols.

(ii)

Starch: any 2

correct reference to amylose and/or amylopectin;

glycosidic bonds ( $\alpha$  1-4);

molecules coil/branch (in amylopectin); NOT compact

NOT: amylopectin - coiled or amylose branched

easy to add/remove {glucose / maltose} units; 2

Cellulose: any 2; 2

alternate units rotate / head up, head down / 180° rotation;

straight chain only / no branches; NOT parallel

hydrogen bonds between / reference to cross linking;

gives strength or stability / forming microfibrils;

Question 1 total 6

2.	Question	Marking details	Marks Available
2	(a)	(i) Ester;	1
		(ii) Hydrolysis;	1
		(iii) Glycerol and fatty acid drawn correctly; Glycerol and fatty acid named;	2
		(iv) Glycerol and fatty acids have different structures / OWTF; (not just reference to monomers)	1
	(b)	(i) (Oleic acid is) unsaturated; It contains at least one C=C double bond (in the hydrocarbon chain) / is not fully saturated with hydrogen (atoms); NOT hydrogen bonds/ fewer hydrogens	2
		(ii) Any 2 protection of internal organs against impact; <u>thermal</u> insulation; buoyancy; waterproofing skin/fur; source of metabolic water;	Max 2
		<b>Question 2 total</b>	<b>[9]</b>

3.

Question		Marking details	Marks Available
3	(a)	<b>Statement</b>	<b>Letter(s)</b>
		Is a monosaccharide	A,F,G ;
		Any 2 from 3 correct	
		Is a dipeptide	C ;
		Would be found in nucleic acids	A ;
		contain C=C bonds	E ;
	Contains a glycosidic bond	B ;	
		Is a triose sugar	G ;
	(b)	(i) Add Benedicts/Fehlings (reagent) and <u>heat / boil</u> ;	
		Colour would change from <u>blue</u> to {red / orange / green / brown};	2
		Blue precipitate = neutral	
		(ii) Glucose is a reducing sugar / reduces copper II sulphate (to copper I oxide) / sucrose is a non reducing sugar;	1
		<b>Question 3 total</b>	<b>[10]</b>

4.

needed for / found in / used in /component of chlorophyll;

(allow: middle lamella / enzyme co-factors)

component haemoglobin; enzyme Co factors

component nucleic acids/DNA/RNA/ATP/ (plasma) membrane/ phospholipids/

hardens bone / nucleotide;

hardens/deposited in bones/teeth/ossification/synaptic transmission

enzyme co-factors/middle lamella (not: strengthen bones)

**[4]**

5. (a) (i) hydrogen/H 1
- (ii) {Holds/binds} {cellulose/glucose} {chains/molecules} 1  
 together/ forms microfibrils;  
 strengthens (the wall)/ (cellulose fibres are) strong/ rigid/ 1  
 gives structural stability/  
 can resist turgor/ osmotic pressure/ prevents plant cells  
 bursting.
- (b) (i) condensation/ polymerisation 1
- (ii) (Has) amino acid (added)/glucosamine 1  
 (to form a mucopolysaccharide)/ amine/ NH<sub>2</sub>
- (iii) (exo)skeleton – strong/waterproof/ light/ rigidity/ tough 1  
 NOT exoskeleton gives protection
- (c) (i) glycogen 1
- (ii) starch (accept amylose/ amylopectin) 1

**(Total 8 marks)**

6. (a) (i) glycerol;  
(3) fatty acids; [2]
- (ii) ester; [1]  
hydrolysis;  
chemical insertion of water/water added to bond [2]
- (iii) energy storage / respiratory substrate/source of energy  
waxy cuticle/leaf waterproofing;  
membrane structure; [2]

**(Total 7 Marks)**

7. (a)	nitrogen (not: N)	1
(b) (i)	<u>heat/boil</u> with {Benedict's/ Fehlings A + B} solution; NOT boil with acid colour change from blue <u>to</u> {green/yellow/orange/brick red/ brown}	1 1
(ii)	A	1
(c)	C	1
(d) (i)	D	1
(ii)	saturated- no double bonds/ all carbon atoms have/attached to two hydrogens ; Fewer hydrogen atoms (or converse) Must have comparison for each	1 1

**(Total 8 marks)**

8. cell wall;  
 beta/ $\beta$ ;  
 glycosidic;  
 180;  
 hydrogen;  
 microfibrils; (not: microfibrres)

[6]

9. (a) (i)	amino acid; triglyceride; (not: lipid/triglycerol)	2
(ii)	nitrogen/sulphur; (not: chemical symbols)	1
(b)	condensation; peptide;	2
(c) (i)	add Biuret to test solution; (not: if ref. to boiling)	1
	blue changing to mauve/purple colour is positive result;	1
(ii)	little colour change/mauve colour may be masked;	1
		(Total 8 marks)



10.

Question	Marking details	Marks Available
(a)	Iron / Fe <sup>2+</sup> ;	1
(b)	{Four polypeptide chains / two alpha and two beta subunits}; in tertiary form are {combined/joined};	2
(c)	Add { <u>biuret</u> (reagent) / copper sulphate <u>and</u> sodium hydroxide}; Reject boil/heat Colour changes from <u>blue</u> to { <u>purple/lilac/violet</u> };	2

**Question 3 Total [5]**

11.

Question	Marking details	Marks available					
		AO1	AO2	AO3	Total	Maths	Prac
11 (a) (i)	Molecules drawn with a peptide bond correct (1) Molecule of <u>water/H<sub>2</sub>O</u> also produced (1)	2			2		
	(ii) peptide bond	1			1		
(b) (i)	Quaternary	1			1		
	(ii) α helix (1) By hydrogen bonding (1) Ignore reference to peptide bonds	2			2		

12. (a) Quaternary/ 4°; 1
- (b) (i) (Labelled) arrow in correct position; 1
- (ii) COOH/ carboxyl/ carboxylic acid; 1
- (iii) Disulphide {bond/ bridges} / ionic bonds / hydrogen / hydrophobic interactions / Van der Waals; (Any 2) 1  
NOT peptide / S-S (covalent – neutral)
- (c) **Mark points must be comparative** Max 2
- | phospholipid   | triglyceride                      |
|--|-----------------------------------|
| 2 fatty acids  | 3 fatty acids;                    |
| phosphate (head)                                       | do not contain a phosphate (head) |
| polar/hydrophilic head and non-polar/hydrophobic tails | non-polar/hydrophobic;            |
- (d) (i) {Heads/ phosphates} are {hydrophilic/ polar} and are {attracted to/ in} the water; 2  
{Tails/ fatty acids} are {hydrophobic/ non polar} and are {repelled by/ above/ avoid} water;  
NOT react/ dissolve with water

**13. (a)**

(i)

OH and H removal shown on diagram;  
formation of water (H<sub>2</sub>O) shown;  
dipeptide correctly drawn with C joined to N; [3]

(ii)

Condensation; [1]

(iii)

Peptide; NOT dipeptide; [1]

- 14. (a)**
- |       |   |   |
|-------|---|---|
| (i)   | Molecule of water (drawn with arrow towards the O atom of the glycosidic bond); NOT water going out<br>Monosaccharides drawn with –OH groups in correct position on C1 and C4 (involved in bond); | 2 |
| (ii)  | Hydrolysis; NOT hydrolysis (ignore reference to acid)   | 1 |
| (iii) | Glycosidic;   | 1 |
| (iv)  | Glucose <u>and</u> galactose; ignore alpha/ beta  | 1 |