Biological Molecules

Mark Scheme 1

Level	IGCSE
Subject	Biology
Exam Board	CIE
Topic	Biological Molecules
Sub-Topic	
Paper Type	Alternative to Practical
Booklet	Mark Scheme 1

Time Allowed: **47 minutes**

Score: **/39**

Percentage: **/100**

1	**(a (i)**	outline clear, unbroken lines **;** size to show both outlines equal in size to fill more than the 6 cm of the available space **;** drawing shows arrangement of seeds and calyx on outer view **;** drawing shows arrangement of receptacle and surrounding vessels on cut surface **;** label to show: sepal / calyx / seed(s) / receptacle / fleshy or edible part / AW **;**	[5]	
	(ii)	(fruit) is edible / eaten (by animals / humans) **;** seeds pass through (body / alimentary canal) unharmed / undigested **;** egested / deposited in, excreta / faeces **;**	[max 2]	

<table>
<tr><td>(b) (i)</td><td>safety – test-tube holder or tongs / use of hot water bath / goggles / heat proof gloves / knife safety ;
Benedict’s reagent or component chemicals ;
(reagent) heated ;
orange / (brick) red / green / AW ; i.e. colour of positive result</td><td>[4]</td><td></td></tr>
<tr><td>(ii)</td><td>biuret (reagent) or the named components ;
expected positive result – (mauve / purple / lilac) AW ;</td><td>[2]</td><td></td></tr>
<tr><td>(c) (i)</td><td>presence of sepals ;
seeds present ;
seeds present in, pits / AW ;</td><td>[max 2]</td><td></td></tr>
<tr><td>(ii)</td><td><table>
<tr><td>feature</td><td>S</td><td></td></tr>
<tr><td>seed</td><td>lig / smaller / deeper pits</td><td>darker / larger / shallower pits ;</td></tr>
<tr><td>shape</td><td>ro</td><td>elongated / oval ;</td></tr>
</table></td><td>[2]</td><td></td></tr>
<tr><td></td><td></td><td>[Total: 17]</td><td></td></tr>
</table>

Question	Mark Scheme	Mark	Guidance
2 **(a)**	Benedict's reagent / solution / test; heat / boil; *safety feature:* goggles / water bath / tongs; *correct colour change:* blue to green / yellow / orange / red; 	[4]	**A** Bendicts / Benedicks **A** Fehlings / copper sulphate and sodium hydroxide **I** copper sulphate alone **I** warm / burn **A** hair tied back / gloves / lab coat **A** turquoise for blue **R** if omit blue Mark each point independently
(b)	blue to purple / mauve / lilac / violet;;	[1]	**R** blue to purple black Need starting colour and end colour for the mark
(c) (i)	*conclusion* – acid damages / reacts with / denatures the albumen ;	[1]	**R** restating the results
(ii)	control / comparison / to maintain volume in test tube;	[1]	**I** makes solution neutral / to see the effect of the acid

(d)	cloudy / white solid / milky / white (emulsion) ;	[1]	**A** turbid / turpid
(e)	*variable to change:* concentration / strength of acid / pH of acid; *variable to measure: rate /* speed of change (to cloudy) / amount of white solid / degree of cloudiness ; *variable to control:* volume or amount of albumen / temperature;	[3]	**I** pH unqualified / volume or amount of acid / type of acid **A** suitable changes to albumen **I** colour change **A** same type of albumen / same egg / type of egg **I** volume of acid
		[Total: 11]	

<table>
<tr>
<td>3 (a) (i)</td>
<td>One visible from;
Skin / peel / outer wall / shell;
outer layer darker than inside;
side buds / spots / ‘eyes’ present;
inner tissue – similar colour;</td>
<td>[1]</td>
<td></td>
</tr>
<tr>
<td>(ii)</td>
<td>
<table>
<tr><th>feature</th><th>potato</th><th>irish potato</th></tr>
<tr><td>inner tissue</td><td>spotted / speckled</td><td>no spots, uniform;</td></tr>
<tr><td>skin / peel / wall</td><td>darker
thicker</td><td>lighter;
thinner;</td></tr>
<tr><td>shape of ends</td><td>pointed / slanted (both ends)</td><td>rounded (both ends) ;</td></tr>
<tr><td>overall shape</td><td>long / narrow</td><td>short / round / more circular / oval;</td></tr>
<tr><td>margin</td><td>two layers visible
not smooth / uneven</td><td>one layer;
smooth;</td></tr>
<tr><td>section shape</td><td>circular /rounded
smaller</td><td>oval;
larger;</td></tr>
<tr><td>stalk / root *</td><td>absent</td><td>present;</td></tr>
</table>
</td>
<td>[max 2]</td>
<td>I. differences in composition – starch / storage.

Any two differences.
Comments should match and accept one difference per printed row on the question paper.
Both spaces on mark scheme for 2 differences can refer to the same feature e.g. skin or margin.

Look for comparative terms … ‘-er’.

* scar or hairs at the base</td>
</tr>
</table>

(b)	1. *starch* equal sample size of each potato; ONCE iodine <u>solution</u> / iodine in KI / iodine reagent; same concentration / volume of iodine solution; expected colour change; (yellow / orange / red brown to blue / blue black / purple) compare colour change; (how fast / darker) (using colorimeters) *Safety* – **one** from: Tie back hair / tie; ONCE Safety goggles / spectacles; ONCE Lab coat; ONCE 2. equal samples – same volume of water / same preparation / grinding; ONCE Benedict's reagent; same volume / amount of Benedict's solution; heating; expected colour change; (blue → green / orange / red) compare colours; (intensity of colour – or timing of colour change) (use of colorimeters) *Safety* – **one** from: water bath; test-tube holders; same as above	[max 3] [max 5] [8 marks]	**A.** drops of iodine if stated number of drops but ignore vague references such as few or several. 'same volume of iodine solution' = 2. **I.** using ethanol. Need original and final colours for expected change. **A.** chemical components / Fehling's / Clinistix. (pink → dark blue) Not just warm but heat – maybe used a boiling water bath = 2 marks. Need original and final colours for expected change. **I.** repeats. If describe biuret ignore description of test but allow safety point.
		[Total: 11]	