

# Characteristics and Classification of Living Organisms

## Mark Scheme 2

<b>Level</b>	IGCSE
<b>Subject</b>	Biology
<b>Exam Board</b>	CIE
<b>Topic</b>	Characteristics and Classification of Living Organisms
<b>Sub-Topic</b>	
<b>Paper Type</b>	Alternative to Practical
<b>Booklet</b>	Mark Scheme 2

**Time Allowed:** 56 minutes

**Score:** /46

**Percentage:** /100

- 1 (a) (i) drawing :- larger than Fig. 2.1;  
clear outline;  
proportion;  
labels:- cotyledon;  
radicle;  
plumule;  
testa; [Max 6]
- (ii) measured length of seed on drawing and of seed on Fig 2.1;  
correct sum attempted;  
correct magnification; [3]
- (b) soaked seeds;  
equal mass/AVP;  
grind up/chop seeds;  
dissolve protein;  
test with biuret reagents;  
detail of quantity of reagents;  
purple colour develops;  
comparison of colour/use of colorimeter;  
*equal ONCE* [Max 4]
- TOTAL [13]

<b>2 (a) (i)</b>	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]	
<b>(ii)</b>	(fruit) is edible / eaten (by animals / humans) ; seeds pass through (body / alimentary canal) unharmed / undigested ; egested / deposited in, excreta / faeces ;	[max 2]	

<b>(b) (i)</b>	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			[4]										
<b>(ii)</b>	biuret (reagent) or the named components ; expected positive result – (mauve / purple / lilac) AW ;			[2]										
<b>(c) (i)</b>	presence of sepals ; seeds present ; seeds present in, pits / AW ;			[max 2]										
<b>(ii)</b>	<table border="1"> <thead> <tr> <th>feature</th> <th colspan="2"><b>S</b></th> </tr> </thead> <tbody> <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> </tbody> </table>			feature	<b>S</b>		seed	lig / smaller / deeper pits	darker / larger / shallower pits ;	shape	ro	elongated / oval ;	[2]	
feature	<b>S</b>													
seed	lig / smaller / deeper pits	darker / larger / shallower pits ;												
shape	ro	elongated / oval ;												
				<b>[Total: 17]</b>										

3 (a)	<p><b>Drawing:</b>  <b>O</b> Clear lines and no shading;  <b>S</b> Larger than photograph;  <b>D</b> Hairs drawn precisely;  <b>P</b> Seed area drawn with regard to shape;  <b>Labels:</b> attachment / position of seed / hairs;</p>	[5]	<p>4 drawing marks</p> <p>Hairs to be attached to the top end of fruit – not matted  Hairs shown as straight, single lines  <b>Ignore</b> ornamentation on seed.  <b>Ignore</b> incorrect labels  <b>Accept</b> alternative wording for hairs  <b>Ignore</b> words which describe other biological features</p>
(b) (i)	<p>Length of fruit in Fig. 2.1 in mm / cm 7.3 <math>\pm</math> 0.2 mm / 7.3 <math>\pm</math> 0.2 cm;  Length of fruit in drawing in mm / cm (<math>\pm</math> 2 mm or <math>\pm</math> 0.2 cm);</p>	[2]	<p>penalise once for incorrect / absent units</p>
(ii)	<p>Correct magnification and X;</p>	[2]	<p><b>Accept</b> error carried forward from (b)(i)  <b>Accept</b> correct answer for 2 marks even if no working shown  <b>Accept</b> X before or after magnification / “times”</p> <p>If answer incorrect allow max 1 for correct working e.g.  length of drawing / length of image – in words or figures</p>

(c) (i)	feature	fruit [Fig. 2.2]	Damp fruit [Fig. 2.3]	[2]	One mark for identifying feature wherever in table Error carried forward for feature from label in <b>2a</b>  2 <sup>nd</sup> mark for description
	Hairs / parachute / pappus / AW;	Wide spread / AW  <b>AND</b>	Closed / close / AW;		
(ii)	<b>Five marks from:</b>  <b>dispersal:</b> 1. dry / windy – seeds blown away; 2. increase of surface area / bigger to ‘catch’ the wind / breeze / air currents in the dry; 3. wet – drop to the ground / are not dispersed; 4. to spread away from parent plant / to new place / habitat; 5. avoids competition with parent plant / each other / avoids overcrowding / more space;  <b>germination:</b> 6. wet / damp soil / place / humid; 7. enzyme activation / working / respiration ORA; 8. warmer; 9. AVP;			Max [5]	<b>Ignore</b> pollen / spores dispersed by wind  <b>4.</b> must be linked to dispersal not just germinating in new habitat
				[Total: 16]	