

# Variation and Selection

## Mark Scheme

<b>Level</b>	IGCSE
<b>Subject</b>	Biology
<b>Exam Board</b>	CIE
<b>Topic</b>	Variation and Selection
<b>Sub-Topic</b>	
<b>Paper Type</b>	Alternative to Practical
<b>Booklet</b>	Mark Scheme

**Time Allowed:** 20 minutes

**Score:** /16

**Percentage:** /100

1	<b>(a (i))</b>	Two similar visible features from: tentacles;  foot;  unsegmented body / no segments AW;	[max 2]	I. sense organs / eyes / antennae I. shape of body I. slimy / mucus / soft I. no legs
	<b>(ii)</b>	One difference: shell;	[1]	A. darker A. different number tentacles A. shiny
	<b>(b)</b>	Any one from: protection qualified e.g. against predators / (named) environmental factor;  prevent desiccation;	[max 1]	I. shelter / hiding alone A. waves / wind A. camouflage /hiding if qualified e.g. from predators
			<b>[Total: 4]</b>	

Question	scheme	Mark allocation	Guidance
2 (a) (i)	<p><b>Drawing:</b>  <b>S:</b> size greater than original;  <b>O:</b> outline shape to show proportions of feather A;  <b>D:</b> one correct detail;  <b>Label:</b> one from rachis / calamus / after feathers / vane / shaft / quill / umbilicus / barb;</p>	[4]	<p><b>Award max 3 for drawing and max 1 for labels</b>            If feather B drawn, accept <b>S</b> [<math>&gt; 82</math> mm] only for drawing and accept correct label, max 2</p> <p><b>Accept</b> evidence of smooth surface top left / middle region / smoother base / two projections lower right / rachis</p> <p><b>Accept</b> attachment to body / filaments</p>
(ii)	insulation / trap (body) warmth / prevents loss of (body) warmth / traps air / protection against cold / AVP;	[1]	<p><b>Ignore</b> warm / heat the bird  <b>Ignore</b> protect alone  <b>Ignore</b> camouflage / attraction / breeding / cover</p>
(iii)	flight; blade like / rigid / stiff / wind or air resistance / air will not pass through / aerodynamic / AW;	[2]	<p><b>Accept</b> glide  <b>Ignore</b> feathers packed together  <b>Ignore</b> increase surface area            Less wind / air resistance loses second marking point.</p>
(b) (i)	<p>correct area / <math>12.5 \text{ cm}^2 (\pm 1 \text{ cm}^2)</math>;            evidence that <math>1 \text{ square} = 1 \text{ cm}^2</math>;            marks on feather or grid to show it was used to calculate the area of feather;</p> <p>reference to number of whole and part squares in the working;</p> <p>double calculated area to give total surface area;</p>	[max 3]	<p><b>Accept</b> <math>25 \text{ cm}^2 (\pm 1 \text{ cm}^2)</math> if they have doubled the area  <b>Accept</b> statement or correct use in calculation or on grid</p>

Question	scheme	Mark allocation	Guidance
(ii)	<p>Divide feather into (geometric) shapes; measure and add together areas of each shape; <b>OR</b> Cut out shape of feather in paper and weigh mass; cut out known area of paper and weigh mass; calculate area of paper; <b>OR</b> Cut feather into small pieces; fit into 1 cm<sup>2</sup> squares; <b>OR</b> Use grid with smaller squares; count squares covered by feather / AW;</p> <p>Double calculated area to give total surface area;</p>	<p><b>[max 2]</b> <b>[Total: 12]</b></p>	<p><b>Ignore</b> smaller grid unqualified</p> <p>This mark can be awarded with any other mark</p>