



*Rewarding Learning*

**ADVANCED SUBSIDIARY (AS)  
General Certificate of Education  
2019**

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## **Biology**

**Assessment Unit AS 3**

*assessing*

**Practical Skills in AS Biology**

**[SBY31]**

**THURSDAY 2 MAY, MORNING**

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**MARK  
SCHEME**

## General Marking Instructions

### Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

### The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

			AVAILABLE MARKS									
1	(a)	<table border="1"> <thead> <tr> <th></th> <th>Sampling device</th> <th>Type of animal sampled</th> </tr> </thead> <tbody> <tr> <td>A</td> <td><b>Pit-fall trap;</b></td> <td><b>any insect that crawls in the leaf litter/surface of the ground;</b></td> </tr> <tr> <td>B</td> <td><b>quadrat;</b></td> <td><b>any sedentary or slow moving animal – snail, barnacle, limpet;</b></td> </tr> </tbody> </table>		Sampling device	Type of animal sampled	A	<b>Pit-fall trap;</b>	<b>any insect that crawls in the leaf litter/surface of the ground;</b>	B	<b>quadrat;</b>	<b>any sedentary or slow moving animal – snail, barnacle, limpet;</b>	
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		[4]										
	(b)	Level with ground/checked every 24h/camouflaged/layer of alcohol/other appropriate response;	[1] 5									
2	(a)	Palisade layer correctly labelled <b>X</b> ; air spaces/aerenchyma/stomata correctly labelled <b>Y</b> ;	[2]									
	(b)	Not representative of the specimen; layers not proportional, e.g. upper epidermis too thick; cells drawn so not a block diagram;	[3] 5									
3	(a)	Red;	[1]									
	(b) (i)	Result at 8 mins/52;  Any <b>two</b> from: <ul style="list-style-type: none"> <li>• samples not equally shaken</li> <li>• variation in volume of iodine used</li> <li>• cuvettes not optically identical/incorrect orientation</li> <li>• cuvette dirty</li> <li>• cuvette not filled to correct level</li> <li>• blank reference not used following previous reading;</li> </ul>	[3]									
	(ii)	Not all enzymes have been denatured yet (some starch broken down);	[1]									
	(c)	Plot a calibration curve of % transmission vs starch concentration; using standard/known concentrations of starch/use serial dilution to create calibration curve of known starch concentration and % transmission/ description of how to read off concentration of starch from graph;	[2] 7									
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			AVAILABLE MARKS
5	<p>(a) AV/bicuspid/mitral valve; chordae tendinae/valve tendon; papillary muscle; (left) ventricle wall/cardiac muscle of ventricle;</p>	[4]	
	<p>(b) Any <b>pair</b> from:</p> <ul style="list-style-type: none"> <li>• D would be thinner;</li> <li>• as it needs to create less pressure/pump blood to lungs;</li> </ul> <p><b>or</b></p> <ul style="list-style-type: none"> <li>• chordae tendinae are smaller/thinner on right/;</li> <li>• due to less pressure created;</li> </ul> <p><b>or</b></p> <p>More papillary muscle/chordae tendinae; A has 3 flaps/cusps;</p> <p><b>or</b></p> <p>A has 3 flaps/cusp; as less pressure on that side/blood has to travel a shorter distance;</p>	[2]	6
6	<p>essential safety – fume cupboard/well aired space;</p> <p>Any <b>three/four</b> from:</p> <ul style="list-style-type: none"> <li>• saturate tank with solvent</li> <li>• concentrate spot</li> <li>• method to avoid contamination</li> <li>• place in tank with pencil origin line above the solvent</li> <li>• include standards/known amino acids</li> </ul> <p>Any <b>one/two</b> from:</p> <ul style="list-style-type: none"> <li>• chromatogram should be (dried then) sprayed (with ninhydrin);</li> <li>• then dried/heated to develop the spots</li> </ul>	[6]	6
7	<p>(a) A anaphase; B metaphase; C prophase;</p>	[3]	
	<p>(b) 15 mm <math>15 \times 1000 = 15\,000</math>; <math>15\,000/30 = \times 500</math>;</p>	[3]	
	<p>(c) Acetic orcein/toluidine blue/other appropriate stain; to make the chromosomes/chromatids more visible;</p>	[2]	8

		AVAILABLE MARKS
<b>8</b>	<p><b>(a)</b> Appropriate scatter graph drawn; axes labelled with suitable scale and units; points plotted accurately; [3]</p> <p><b>(b)</b> There is a negative correlation between light intensity and percentage cover (of H. non-scripta)/as light intensity increases, percentage cover (of H. non-scripta) decreases; [1]</p> <p><b>(c)</b> <b>(i)</b> Light meter/other appropriate response; [1]</p> <p><b>(ii)</b> A clearing/trees fallen/firebreak/river/other appropriate response; [1]</p> <p><b>(iii)</b> Same orientation of light meter/position relative to ground/same cloud cover/other appropriate response; [1]</p> <p><b>(d)</b> Temperature/humidity/soil moisture/pH/humus/mineral (ion) content/carbon dioxide/wind speed; [1]</p>	8
<b>Total</b>		<b>50</b>

Percentage cover of *H. non-scripta* against light intensity in an area of woodland

