



Rewarding Learning

**ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2018**

Biology

Assessment Unit AS 3

assessing

Practical Skills in AS Biology

[SBY31]

WEDNESDAY 2 MAY, MORNING

**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)	Any two from: <ul style="list-style-type: none"> • the paper is a good fit to the vessel used for running the chromatogram/ it will extend into the solvent but not as far as the base line • the base line should be drawn in pencil • spots should be allowed to dry between application of the concentrated spot/the concentrated spot should form a very small area • avoid contamination of the chromatogram/solutions • saturate the tank in advance of running the chromatogram 	[2]	5
	(b)	(i) Position of spot for amino acid A correctly identified;	[1]	
		(ii) $7 - 1 = 6$ and $11 - 1$; $6 \div 10 = 0.60$;	[2]	
2	(a)	Any three from: <ul style="list-style-type: none"> • in the centre of the wood, frequency of lesser celandine is low • frequency increases to reach a peak at the edge of the wood • decreases outside the wood into the grassland • between 70–100 m in the grassland no lesser celandine present 	[3]	4
	(b)	There is sufficient light and no/little competitive grass growing at the wood edge;	[1]	
3	(a)	X – Blood; Y – Fibrous tissue;	[2]	6
	(b)	Thick wall (relative to lumen)/round in cross section;	[1]	
	(c)	Scale bar = 30 mm; $30 \times 1000 = 30\,000\ \mu\text{m}$; $30\,000 \div 250 = 120$;	[3]	
4	(a)	(i) Distilled water;	[1]	9
		(ii) To obtain maximum differentiation across the results;	[1]	
		(iii) Appropriate column/row headings, e.g. temperature, % transmission; appropriate units, e.g. °C and % (and must not be in body of the table/in brackets); data correctly entered in table;	[3]	
		(iv) (% transmission increases with temperature) as cell membranes break down/become more permeable at higher temperatures; allowing more pigment to diffuse into water (surrounding the beetroot section);	[2]	
	(b)	The % transmission will be lower (at higher temperatures); the accumulation of damage over time/other appropriate response;	[2]	

		AVAILABLE MARKS
<p>5 Accurate outline drawing of whole section; all named layers added and in proportion; quality of drawing good with no unbroken lines and no cells drawn; submucosa correctly labelled; muscularis externa correctly labelled;</p>	[5]	5
<p>6 Any four from:</p> <ul style="list-style-type: none"> • prepare cylinders/sections of potato and weigh • add the cylinders/sections of potato to a range of sugar/sucrose solutions • leave for between 1–48 hours • remove the potato, surface dry and reweigh • calculate percentage change in mass for each potato cylinder/section • where the line of best fit crosses the x-axis, the solute potential of the immersing solution is equal to the water potential of the potato tissue <p>Essential point:</p> <ul style="list-style-type: none"> • plot percentage change in mass against solute potential of the sucrose 	[5]	5
<p>7 (a) Amount of lactose remaining decreases each time; decrease is greatest the first time(s) milk is poured through syringe; lactase on beads breaks down the lactose; (the first time(s) milk is poured through syringe) more substrate molecules available (to form ES complexes);</p>	[4]	
<p>(b) More lactose is broken down each time the milk is poured through the syringe; milk flows more slowly (due to smaller beads)/larger surface area available so more enzymes available; more active sites available/more ES complexes can form;</p>	[3]	
<p>(c) Any two from:</p> <ul style="list-style-type: none"> • same volume/type/age of milk • milk at same temperature • same type beads/beads prepared at same time • other appropriate response 	[2]	
<p>(d) Test with Clinistix or other glucose-specific test;</p>	[1]	10

- 8 (a) Any **four** from:
- (at low power) line up the zero values of the eyepiece graticule and the stage micrometer
 - find a position further along the slide where the marked division lines in both scales overlap
 - this distance can be calculated on the stage micrometer
 - length of each eyepiece division can be calculated by dividing the distance calculated on the stage micrometer by the number of eyepiece divisions
- [4]
- (b) Loss of turgor;
due to water loss/evaporation;
- [2]

Total

**AVAILABLE
MARKS**

6

50