



Rewarding Learning

**ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2025**

Biology

Assessment Unit AS 3

assessing

Practical Skills in AS Biology

[SBY31]

WEDNESDAY 28 MAY, MORNING

**MARK
SCHEME**

General Marking Instructions

Introduction

The main purpose of the mark scheme is to ensure that examinations are marked accurately, consistently and fairly. The mark scheme provides examiners with an indication of the nature and range of candidates' responses likely to be worthy of credit. It also sets out the criteria which they should apply in allocating marks to candidates' responses.

Assessment objectives

Below are the assessment objectives for Biology.

Candidates should be able to demonstrate:

- AO1** Knowledge and understanding of scientific ideas, processes, techniques and procedures.
- AO2** Apply knowledge and understanding of scientific ideas, processes, techniques and procedures:
- in a theoretical context
 - in a practical context
 - when handling qualitative data
 - when handling quantitative data.
- AO3** Analyse, interpret and evaluate scientific information, ideas and evidence, including in relation to issues, to:
- make judgements and reach conclusions
 - develop and refine practical design and procedures.

Quality of candidates' responses

In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity which may reasonably be expected of a 17 or 18-year-old which is the age at which the majority of candidates sit their GCE examinations.

Flexibility in marking

Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of unanticipated answers, examiners are expected to use their professional judgement to assess the validity of answers. If an answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

Positive marking

Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range for any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 17 or 18-year-old GCE candidate.

Awarding zero marks

Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate.

Marking calculations

In marking answers involving calculations, examiners should apply the 'own figure rule' so that candidates are not penalised more than once for a computational error. To avoid a candidate being penalised, marks can be awarded where correct conclusions or inferences are made from their incorrect calculations.

/ denotes alternative points

; denotes separate points

Comments on mark values are given in bold

Comments on marking points are given in italics

AVAILABLE
MARKS

Where one response is required to gain a mark, candidates will not gain credit if a correct response is given alongside one or more incorrect responses. This is referred to as listing.

1	A – starch; B – protein; C – reducing sugar or named example – maltose, fructose, glucose; D – sucrose/non-reducing sugar;	[4]	4
2	(a) X – artery; Y – lumen; Z – vein;	[3]	
	(b) (Micrograph) colour/not detailed/low magnification;	[1]	
	(c) (Z has) less muscle in wall (for support); (comparative term required)	[1]	5
3	(a) (i) 10 μm ;	[1]	
	(ii) 10 small EPU = 25 micrometer divisions; 1EPU = $2.5 \times 10 \mu\text{m}/25 \mu\text{m}$;	[2]	
	(iii) Rotate eyepiece and eyepiece graticule will also rotate/stage micrometer will not move;	[1]	
	(b) 35 EPU; $35 \times 8.7 = 304.5 \mu\text{m}$;	[2]	
	(c) More accurate measurement possible;	[1]	7
4	(a) Sweep net; (<i>essential</i>) Any four from: <ul style="list-style-type: none">• sweep in a figure of eight/back and forth• set number of sweeps• at regular intervals/5–10 m• maintain same height above ground• use the same net/size of net• count/record number of butterflies	[5]	
	(b) Light intensity/temperature/soil moisture/OAR;	[1]	6

			AVAILABLE MARKS
5	<p>(a) The strips become darker with each pour; glucose increases with the more times the milk is poured; with more pours there is more time for lactase to break down the lactose; [3]</p> <p>(b) (i) Immobilised; [1]</p> <p style="padding-left: 20px;">(ii) Alginate/OAR; [1]</p> <p>(c) Lower concentration of glucose detected; less surface area for formation of ES complexes; [2]</p>		7
6	<p>(a) (i) KOH/NaOH; [1]</p> <p style="padding-left: 20px;">(ii) Correct position of M on the dashed line; [1]</p> <p style="padding-left: 20px;">(iii) Water bath; [1]</p> <p>(b) $22 \div 25 = 0.88$; $0.88 \div 5$; $0.176 \text{ mm min}^{-1} \text{ g}^{-1}$; [3]</p> <p>(c) Prediction – rate of uptake will decrease; explanation – respiration is slower; enzymes/reactants have less kinetic energy; [3]</p>		9
7	<p>(a) (i) Number of cells plasmolysed; [1]</p> <p style="padding-left: 20px;">(ii) Cell contents decreased/vacuole shrunk; cell membrane pulled away from cell wall; [2]</p> <p>(b) (i) 20, 48 and 72 (3 correct = [2] marks, 2 correct = [1] mark); [2]</p> <p style="padding-left: 20px;">(ii) x-axis labelled – concentration of salt solution/M; y-axis labelled – % of cells plasmolysed; points plotted correctly and appropriate scale; appropriate line of best fit drawn; [4]</p> <p>(c) Find the concentration that produces 50% plasmolysis; use a conversion table/calibration curve to convert M into solute potential; [2]</p> <p>(d) Incipient plasmolysis [1]</p>		12
Total			50