



*Rewarding Learning*

General Certificate of Secondary Education  
2017

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**Double Award Science: Biology**

Unit B2

Higher Tier

[GSD42]

FRIDAY 9 JUNE, 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.

<b>1 (a) (i)</b>	The majority of people with STIs have no symptoms	[1]	<b>AVAILABLE MARKS</b> 5
<b>(ii)</b>	embarrassment/parents might find out/don't know what symptoms indicate/denial	[1]	
<b>(b) (i)</b>	Completion of second row with person; two arrows for each person in the second row;	[2]	
<b>(ii)</b>	14	[1]	

## 2 (a) (i) Indicative content

Any **five** from:

- weigh leaf/weigh leaves;
- leaf with vaseline on one surface or named surface;
- leaf with vaseline on other surface;
- hung up/attach to line;
- for a time, do both at same time/use stopclock;
- reweigh leaf or leaves;
- rate = difference in weight or mass ÷ time;

Band	Response	Mark
A	Candidates use appropriate terms throughout to give at least <b>five</b> points from the indicative content. They use good spelling, punctuation and grammar skills. Form and style are of a high standard.	[5]–[6]
B	Candidates use appropriate terms throughout to give at least <b>three or four</b> points from the indicative content. They use satisfactory spelling, punctuation and grammar. Form and style are of a satisfactory standard.	[3]–[4]
C	Candidates use appropriate terms throughout to give <b>one or two</b> points from the indicative content. They use limited spelling, punctuation and grammar and have made little use of specialist terms.	[1]–[2]
D	Response not worthy of credit.	[0]

[6]

(ii) Any **two** from:

- wind speed;
- temperature;
- same amount of vaseline;

[2]

(iii) stomata

[1]

(b) B

[1]

(c) Any **two** from:

cooling;  
transport;  
photosynthesis;  
turgor/support;

[2]

AVAILABLE  
MARKS

12

			AVAILABLE MARKS		
3	(a) (i)	4 – 20	[1]	12	
	(ii)	$12 + 10 + 8 + 6 + 4 + 3; = 43$	[2]		
	(iii)	<b>more</b> aware/ <b>more</b> touch receptors/ <b>more</b> sensitive; example: navigation/helps find shelter/find mates/avoid danger/ avoid injury/escape predators/find food;	[2]		
(b)	(i)	RR; Rr	[2]		
	(ii)	punnett; R and R (as gametes) or R; r and r (as gametes) or r; correct cross	[4]		
	(iii)	red eyes	[1]		
4	(a)	38	[1]		10
	(b) (i)	has got longer rather than shorter/doesn't fit the pattern/should have been a decrease	[1]		
		(ii)	not <b>measured</b> correctly at the start/end/put into the wrong (sugar) solution/different temperature/different potato/sugar solution not correct		
	(c) (i)	any value between 5.1% and 10%	[1]		
		(ii)	Any <b>two</b> from: in between where it lengthens and shortens/where there is no change in length; no net movement of water; concentration of solution same inside and out	[2]	
	(d) (i)	cell membrane	[1]		
		(ii)	level of sugar solution has moved up the tubing/volume of sugar solution in tubing has increased; so <b>water</b> has passed through the Visking tubing; from a dilute sugar solution to a concentrated sugar solution (must have said water to get this mark)	[3]	

		AVAILABLE MARKS
5	(a) 0.0011 or 349614; 0.11; 99.89	[3]
	(b) (i) don't need trained personnel/no fear of needles/no infected needles	[1]
	(ii) 2010 to 2011	[1]
	(iii) Nigeria decreasing as Pakistan increases	[1]
	(iv) line at <b>same</b> gradient; correct reading, i.e. 470–500;	[2]
		8

## 6 (a) Indicative content

Any **five** from:

- modified/attenuated/dead/weakened/virus/bacteria/microorganism;
- lymphocytes/WBC; correct reference
- ANTIGEN mark
  - antigen on microbe/booster contains antigen/WBC or lymphocyte recognises antigen/antibodies produced to match antigen
- REASON mark
  - increase immunity/maintain immunity/so don't get disease
- **more** antibodies produced;
- antibodies produced **quicker**;
- antibodies stay **longer**;
- **more** memory cells/**more** memory lymphocytes;

Band	Response	Mark
A	Candidates use appropriate terms throughout to give at least <b>five</b> points from the indicative content. They use good spelling, punctuation and grammar skills. Form and style are of a high standard.	[5]–[6]
B	Candidates use appropriate terms throughout to give at least <b>three or four</b> points from the indicative content. They use satisfactory spelling, punctuation and grammar. Form and style are of a satisfactory standard.	[3]–[4]
C	Candidates use appropriate terms throughout to give <b>one or two</b> points from the indicative content. They use limited spelling, punctuation and grammar and have made little use of specialist terms.	[1]–[2]
D	Response not worthy of credit.	[0]

[6]

(b) (i) penicillin [1]

(ii) resistant bacteria survive;  
reproduce;  
pass on resistance/pass on gene; [3]

(c) number of cases of MRSA **before** sanitisers;  
number of cases of MRSA **after** sanitisers [2]

AVAILABLE  
MARKS

12

		AVAILABLE MARKS
7	(a) ova/eggs and sperm can't meet/fertilisation can't take place	[1]
	(b) (i) produce (many) eggs/ova/superovulate	[1]
	(ii) day 14 or 13; ova mature/ready to be fertilised/it is the day when ovulation normally occurs	[2]
	(iii) have reached 8–16 cell stage/ensure that they are developing normally/dividing normally	[1]
	(iv) cause thickening of lining of uterus/increase the chance of implantation	[1]
	(v) implantation	[1]
	(vi) differentiation	[1]
		8
8	(a) (i) Chargaff	[1]
	(ii) make a model/3D modelling	[1]
	(b) C = 9.4; T = 40.6; G = 9.4;	[3]
	(c) (i) deoxyribose	[1]
	(ii) phosphate	[1]
	(iii) base <b>triplet</b> code	[1]
	(iv) valine glycine, leucine threonine;	[2]
	(v) Isoleucine;	[1]
	(vi) a different protein formed/the previous protein is not formed	[1]
		12

9	(a) hold over Bunsen/antibacterial agent/alcohol	[1]	<b>AVAILABLE MARKS</b>
	(b) kill microbes/no live bacteria	[1]	
	(c) <b>genetically</b> identical	[1]	
	(d) asexual	[1]	
	(e) difficult technique/need trained staff/need specialised facilities/expensive/ all will have the same disease if parent has disease/no variation/can't adapt to changing environment	[1]	
10	(a) two cells/two nuclei; both identical chromosomes to parent cell	[2]	5
	(b) <ul style="list-style-type: none"> <li>• each cell haploid;</li> <li>• two cells have X, two cells have Y;</li> <li>• two cells shaded chromosome, two cells clear chromosome;</li> <li>• four cells</li> </ul>	[4]	
<b>Total</b>		<b>90</b>	