



General Certificate of Secondary Education  
2017

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## Double Award Science: Biology

Unit B2

Foundation Tier

[GSD41]

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.

		AVAILABLE MARKS
1 (a) (i) fertilisation	[1]	
(ii) nucleus with haploid number of chromosomes/tail (for swimming)/pointed head	[1]	
(b) (i) testes; Any <b>two</b> from: voice deepens/testes descend/hair in armpits or pubic hair/penis larger/interest in sex/sperm production/broad shoulders or muscular development	[3]	
(ii) ovaries; Any <b>two</b> from: breasts develop/pelvis or hips widen/hair in armpits or pubic hair/interest in sex/menstruation/ovulation/eggs produced	[3]	
2 (a) arteries; backflow; capillaries; permeable	[4]	8
(b) (i) double (circulation)	[1]	
(ii) pulmonary vein; atrium then ventricle; left for both; aorta	[4]	
3 (a) (i) X Y or Y chromosome	[1]	9
(ii) 3 chromosome 21s/47 chromosomes/one extra chromosome; Down (syndrome);	[2]	
(b) (i) for growth/replace worn out cells/repair damaged tissue/make <b>more</b> or <b>new</b> skin cells	[1]	
(ii) 2	[1]	
(iii) 46 chromosomes/the same number of chromosomes	[1]	
(iv) meiosis; ovaries;	[2]	
(c) (i) correct shapes of both <b>bases</b> ; C labelled at top; A labelled at the bottom	[3]	
(ii) backbone	[1]	
(iii) double helix	[1]	
(iv) nucleus/chromosome/gene	[1]	
		14

4	(a) (i) lack of nicotine	[1]	AVAILABLE MARKS
	(ii) Any <b>three</b> from: less CO; more oxygen; (combines with) red blood cells or haemoglobin; more respiration in cells	[3]	
	(iii) <b>tar</b>	[1]	
	(iv) could be another cause/tar still there/cells already mutated/structures already damaged/passive smoking	[1]	
	(b) doesn't pass through the filter	[1]	
	(c) (i) 2000; 2000 $\times$ 11 = 22 000;	[2]	
	(ii) lungs smaller/not fully developed	[1]	
	(d) Any <b>two</b> from: <b>Evidence</b> – not seen as a risk/did not know how dangerous it was/ research only started; <b>Time</b> – to get agreement/pass laws <b>People</b> – many smoked/many people opposed to it/smoking was seen as normal/people addicted <b>Money</b> – pressure from tobacco companies/effect on jobs/customers lost/ taxes/takes money to do it.	[2]	12
5	(a) (i) The majority of people with STIs have no symptoms	[1]	
	(ii) embarrassment/denial/parents might find out/don't know what symptoms indicate	[1]	
	(b) (i) completion of second row with person; two arrows from each person on the second row;	[2]	
	(ii) 14	[1]	5

## 6 (a) (i) Indicative content

Any **five** from:

- weigh leaf/leaves;
- vaseline on one surface or named surface;
- vaseline on other surface of leaf;
- hang up/attach to line;
- time/use stopwatch;
- reweigh leaf or leaves;
- rate = change in 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

7 (a) (i) 4 – 20	[1]	AVAILABLE MARKS
(ii) $12 + 10 + 8 + 6 + 4 + 3 = 43$	[2]	
(iii) <b>more</b> sensitive/more aware/ <b>more</b> touch receptors;  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]	12
8 (a) 0.0011 or 349614; 0.11; 99.89	[3]	
(b) (i) don't need trained personnel/no fear of needles/infected needles	[1]	
(ii) 2010 to 2011	[1]	
(iii) Nigeria decreasing as Pakistan increases	[1]	
(iv) line at <b>same</b> gradients; correct reading i.e. 470–500;	[2]	
		8

9	(a)	38	[1]	AVAILABLE MARKS
	(b)	(i) <b>anomalous</b> it's got longer rather than shorter doesn't fit pattern should have been a decrease	[1]	
		(ii) <b>reason</b> not measured correctly at the start put into wrong (sugar) solution sugar solution not correct potatoes different different type of potato different temperature	[1]	
	(c)	(i) any value between or including 5.1 to 10%	[1]	
		(ii) Any <b>two</b> from: • in between where lengthens and shortens/ where there is no change in length • no movement of water • conc same inside and out	[2]	
	(d)	(i) cell membrane	[1]	
		(ii) more water in bag/more of conc sugar solution • 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]	10
		<b>Total</b>		<b>90</b>