



Rewarding Learning

**General Certificate of Secondary Education
2015**

Biology

Unit 2

Foundation Tier

[GBY21]

MONDAY 15 JUNE, 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) (i) A – tail;	[1]	5
	B – cell membrane;	[1]	
	(ii) Enable sperm to swim (to egg);	[1]	
	(b) oviduct;	[1]	
	(c) zygote;	[1]	
2	Cold virus – Spread by droplet infection;	[1]	4
	Salmonella – Prevented by cooking food thoroughly;	[1]	
	Fungus – Cause of athlete’s foot;	[1]	
	HIV – Spread by sharing dirty needles or sexual intercourse;	[1]	
3	(a) testes;	[1]	5
	(b) (i) low level during childhood; increases during puberty; levels off at adulthood;	[3]	
	(ii) body more muscular/growth of pubic/facial hair/produce sperm/ voice deepens/development of testes;	[1]	
4	(a) 25 (minutes);	[1]	4
	(b) (i) Colin;	[1]	
	(ii) Faster/shorter recovery time; lower resting heart rate; lower maximum heart rate/described/only reaches 90 bpm; (Any two)	[2]	
5	(a) (i) air bubble moves up/water level (in beaker) moves down;	[1]	5
	(ii) Any two from: water evaporates from leaves/transpiration; water taken up by/passes through plant; replaced by water from tube;	[2]	
	(b) Any two from: support; transport; photosynthesis;	[2]	
6	(a) (i) red blood cell	[1]	6
	(ii) haemoglobin; no nucleus; biconcave/large surface area; (Any two)	[2]	
	(b) any named food molecule, e.g. glucose/amino acids; urea; carbon dioxide; hormones; (Any two)	[2]	
	(c) blood clotting;	[1]	

			AVAILABLE MARKS	
7	(a)	Allele is a form of a gene/type of the same gene;	[1]	5
	(b) (i)	bb;	[1]	
	(ii)	Heterozygous;	[1]	
	(iii)	Punnett;	[1]	
	(iv)	1:1;	[1]	
8	(a)	Protein; produced by lymphocyte/white blood cell (in response to antigen); complementary to/fits antigen; destroys antigen/microorganism; (Any two)	[2]	9
	(b)	3.1 < 3.2; 6.8;	[2]	
	(c)	After 35 days antibody level falls below 4/immune threshold (described); Volunteer could catch the disease;	[2]	
	(d) (i)	Body/white blood cells produce own antibodies ;	[1]	
	(ii)	Delay of 5 days before antibody level starts to rise; Level of antibodies takes 15/16 days after vaccine to become immune/ 25 days to reach peak/rises slowly; Level of antibodies not as high (as volunteer A)/peaks at 7; Level of antibodies decreases slowly/remains immune until after 60 days; (Any two)	[2]	
9	(a) (i)	Uncontrolled/abnormal; cell division;	[2]	9
	(ii)	No capsule/cells migrating;	[1]	
	(b) (i)	Bars correctly drawn; Labels and no spaces;	[2] [1]	
	(ii)	Only a small number in age group/not cost-effective	[1]	
	(iii)	early detection; improves chances of successful treatment/can be treated before it spreads;	[2]	

			AVAILABLE MARKS		
10	(a) (i)	Oviducts are cut; prevents ova from moving through to be fertilised;	[2]	6	
	(ii)	Permanent/can't be reversed/very difficult to reverse;	[1]		
	(b) (i)	Barrier; Stops sperm (entering vagina);	[2]		
	(ii)	Helps prevent STIs;	[1]		
11	(a)	(After ban) more pubs have a lower concentration/less nicotine; Before ban most pubs (26) had over 401–500 arbitrary units; After ban most pubs (44) had 0–100 arbitrary units;	[3]	10	
	(b)	Causes addiction; Affects heartbeat;	[2]		
	(c)	Substance – Tar;	[1]		
		Explanation – Causes lung cancer;	[1]		
		Substance – Carbon monoxide;	[1]		
Explanation – Reduces oxygen transport;		[1]			
(d)	Reduced freedom of choice;	[1]			
12	(a)	continuous;	[1]	9	
	(b) (i)	Tally completed correctly; Numbers: 1, 2, 5,1,1;	[2]		
		(ii)	Histogram;		[1]
		(iii)	$3/10 \times 100; = 30;$		[2]
	(iv)	Small sample size;	[1]		
	(c) (i)	Diet/calcium/proteins/vitamin D;	[1]		
		(ii)	Genetic;		[1]
13	(a)	amniocentesis	[1]	7	
	(b)	nucleus;	[1]		
	(c)	Down syndrome;	[1]		
	(d)	Mutation;	[1]		
	(e)	Different genders (A male, B female)/different sex chromosomes/ A–XY B–XX/different numbers of chromosomes (described);	[1]		
	(f)	Abortion (for medical reasons); Risk of miscarriage (caused by screening);	[2]		

14 Indicative content:

- 1 Water has **moved out** of cells;
- 2 Down concentration gradient/described;
- 3 Through selectively/partially permeable membranes;
- 4 Cytoplasm shrank;
- 5 Cell membrane pulls away from cell wall;
- 6 Cells (in concentrated sugar solution) become plasmolysed;
- 7 Cell wall permeable to sugar solution/sugar can pass through cell wall;
- 8 Sugar solution enters inside cell wall;
- 9 Sugar does not enter cell membranes/membrane impermeable to sugar;

Response	Marks
Candidates must use appropriate, specialist terms throughout using AT LEAST FIVE OF the above points . They use good spelling, punctuation and grammar and the form and style are of a high standard .	[5]–[6]
Candidates use some appropriate, specialist terms throughout using at LEAST THREE of the above points . They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
Candidates make little use of specialist terms throughout USING SOME OR ALL of the above points . The spelling, punctuation and grammar, form and style are of a limited standard.	[1]–[2]
Response not worthy of credit.	[0]

[6]

TotalAVAILABLE
MARKS

6

90