Rewarding Learning

General Certificate of Secondary Education
2014

Double Award Science: Biology

Unit B2

Higher Tier

[GSD42]

FRIDAY 6 JUNE 2014, AFTERNOON

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)**	Plasmolysed;	[1]	
	(b)	Same size; Membrane against cell wall <u>and labelled</u>; Cell wall <u>correctly labelled</u> Vacuole drawn <u>larger</u>;	[4]	5
2	**(a)**	Any **two** from: • Antibiotics won't be effective/treatment of viral diseases difficult • Might not be able to get good medical care • Hard to avoid being bitten • To provide him with immunity/to get high levels of antibodies	[2]	
	(b) **(i)**	3.8;	[1]	
	(ii)	Higher percentage of the population in NI were vaccinated. Bigger population in England/converse;	[1]	
	(iii)	Jenner;	[1]	5
3	**(a)**	Correctly labelled	[2]	
	(b)	<u>Double circulation</u>;	[1]	
	(c)	Clockwise order Right ventricle; Pulmonary vein; Left atrium; Aorta;	[4]	7
4	**(a)** **(i)**	As wind increases, the rate of transpiration increases;	[1]	
	(ii)	As the temperature increases, the rate of transpiration increases; As the humidity increases, the rate of transpiration decreases;	[2]	
	(b) **(i)**	To prevent evaporation <u>from the soil/pot</u>;	[1]	
	(ii)	(257.6 – 185.6);/ or ÷ 24 [1] **or** 3 g per hour	[2]	
	(iii)	Any **two** from: • Less surface area/less stomata • Less evaporation/diffusion of water	[2]	
	(iv)	Any **two** from: • Photosynthesis • Support • Transport	[2]	10

5 **(a)** **(i)** Read graph at 82%; 100 – 82 =18 [2]

(ii) Up to 42;
Line at 80;
Line at 90; [3]
(maximum [2] if no shading)

(iii) age 26–30; [1]

(b) **Indicative content**

- Cholesterol laid down in walls
- Of **coronary** arteries
- Reducing blood flow
- Less glucose/oxygen available
- For respiration
- Heart muscle cells die
- So heart can't contract [6]

Response	Mark
Candidates must use appropriate specialist terms throughout to describe how a heart attack occurs (using at least five of the above points). They use good spelling, punctuation and grammar and form and style are of a high standard.	[5]–[6]
Candidates use some appropriate specialist terms to describe how a heart attack occurs (using three **or** four of the above points). They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
Candidates describe how a heart attack occurs. However, the description is not presented in a logical sequence. They use limited spelling, punctuation and grammar and they have made little use of specialist terms.	[1]–[2]
Response not worthy of credit.	[0]

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6 **(a)** **(i)** DNA [1]

(ii) Two nuclei or two cells drawn;
Two chromosomes in each;
identical chromosomes to parent in each; [3]

(b) **(i)** Punnett square;
Hh;
hh;
correct cross; [4]

	H	h
h	Hh	hh
h	Hh	hh

(ii) 50:50/1:1 [1]

(c) Cross with homozygous recessive/wrinkled;
Any wrinkled offspring – then parent was heterozygous;
All offspring smooth – then parent was homozygous; [3]

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AVAILABLE MARKS

7 **(a)** In the blood; [1]

(b) **Indicative content**

- Day 1–5 lining breaks down/wall breaks down
- Day 1–5 hormone levels low

- Hormone level increases after day 5 or 6
- Hormone reaches a peak at day 11, 12, 13 or just before ovulation

- The hormone levels drop after ovulation
- On day 14 an egg is released from the ovary
- Oestrogen made in ovaries

- After day 14 egg moves down oviduct/Fallopian tubes
- Uterus lining built up after 5/6 to day 16

Response	Mark
Candidates use appropriate terms throughout and give at least five points from the indicative content (to include at least two links b/w hormone levels from the graph and two events in the menstrual cycle) to describe and account for the events of the menstrual cycle. They use good spelling, punctuation and grammar. Form and style are of a high standard.	[5]–[6]
Candidates use some appropriate terms throughout and give 3 or 4 points from the indicative content (to include at least one link b/w hormone levels and the menstrual cycle) to describe and account for the events of the menstrual cycle. They use satisfactory spelling, punctuation and grammar. Form and style are of a satisfactory standard.	[3]–[4]
Candidates give one or two points to partially describe/or account for the events of the menstrual cycle. They use limited spelling, punctuation or grammar skills.	[1]–[2]
Response not worthy of credit.	[0]

[6]

(c) **(i)** The man's sperm is added directly to the eggs; in the Petri dish; [2]

(ii) To make sure that they are healthy/growing properly; [1]

(iii) Any **two** from:

- How long should the embryos be stored?
- Who owns/has rights to the embryos/donor embryos?
- Spare embryos may be disposed of/destroyed
- Parents may wish to select, e.g. gender of the child
- Should spare embryos be used for research?
- Religious reasons [2]

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AVAILABLE MARKS

			AVAILABLE MARKS
8	**(a)**	Only one parent/all offspring are identical; [1]	
	(b)	**(i)** Tissue culture; [1]	
		(ii) Any **two** from: • Large leaves/large fruit/high yield • Colour of fruit/texture • Hardiness/frost resistant • Disease resistance **or** any appropriate response [2]	
		(iii) No variation/all susceptible to the same diseases; [1]	5
9	**(a)**	Brown rabbits are better camouflaged/white rabbits are more easily seen; More brown rabbits survive/white rabbits are eaten; More brown rabbits reproduce/breed; Brown rabbits pass on their genes/alleles; [4]	
	(b)	Any **two** from: • **More** snow/so that it is paler/return to grassland/paler crop • Disease in foxes/decrease in rabbit predators/increase of predators of the fox • Disease in **brown** rabbits [2]	6

					AVAILABLE MARKS
10	**(a)**	**(i)**	TAG; Gly;	[2]	
		(ii)	153;	[1]	
		(iii)	Any **two** from: • (Triplet) code would change; • Gly not made/amino acid will be different • Different protein formed	[2]	
	(b)	**(i)**	Plasmid/with label; Gene correctly joined and labelled; All within bacterial cell;	[3]	
		(ii)	The bacteria multiply/replicate;	[1]	
		(iii)	Any **two** from: • Less side effects/it's human insulin/not from cattle • Can produce large quantities of insulin • Cheaper • Quicker • Avoids the use of animal products	[2]	
	(c)	**(i)**	Any **two** from: • The child has to receive one C.F. allele • one from each parent • It is homozygous recessive	[2]	
		(ii)	Any **two** from: • Risk of miscarriage • Should they terminate the pregnancy? • e.g. if they know the child has cystic fibrosis – is it right to bring this child into the world?	[2]	
		(iii)	Down syndrome	[1]	16
				Total	**90**