



GCSE

Biology B

General Certificate of Secondary Education

Unit **B631/01**: Modules B1, B2, B3 (Foundation Tier)

Mark Scheme for January 2011

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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Abbreviations, annotations and conventions used in the detailed Mark Scheme.

/	=	alternative and acceptable answers for the same marking point
(1)	=	separates marking points
not	=	answers which are not worthy of credit
reject	=	answers which are not worthy of credit
ignore	=	statements which are irrelevant
allow	=	answers that can be accepted
()	=	words which are not essential to gain credit
<u> </u>	=	underlined words must be present in answer to score a mark
ecf	=	error carried forward
AW	=	alternative wording
ora	=	or reverse argument

Question			Expected Answers	Marks	Additional Guidance
1	(a)	(i)	D (1)	1	more than one answer score (0) allow answer circled on diagram if no answer on answer line
		(ii)	pancreas (1)	1	
	(b)		breasts develop / hips widen / pubic hair / hair under arms (1)	1	ignore periods / menstruation / menstrual cycle allow egg release / egg production / ovulation ignore become fertile allow body hair but ignore just hair ignore references to moods not any solely male characteristic eg voice deepens
	(c)		(carried) in blood / plasma (1)	1	not pumped by heart not red blood cells allow type of blood vessel / named blood vessel ignore circulation / diffusion
	(d)		any two from: very quick (1) automatic / AW (1) idea of protective (1)	2	allow idea of brain not involved (initially) (1) allow stopped her cutting her foot too badly (1) ignore feels pain after lifts foot
			Total	6	

Question		Expected Answers	Marks	Additional Guidance
2	(a)	(i) 60 – 81 (1)	1	allow any answer within range
	(ii)	34 (2) but $110 / (1.8 \times 1.8)$ OR $110 / 3.24$ (1)	2	correct answer no working = (2) allow 33.95 / 33.950617 (2) allow 33.950 / 33.9 / 33 (1) mark only because incorrect rounding
	(b)	bacon (1)	1	more than one answer score (0)
	(c)	(i) liver damage (1)	1	more than one answer score (0)
	(ii)	few(er) cilia / cilia do not work / cilia damaged / AW (1)	1	allow cilia clogged (1) allow more mucus (1) ignore just covered in mucus allow reference to cancer / DNA damage / AW (1) ignore just cell damage ignore covered in tar / dirt / dust ignore hairs
		Total	6	

Question		Expected Answers	Marks	Additional Guidance
3	(a)	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="border: 1px solid black; padding: 5px; width: 150px; height: 100px; display: flex; flex-direction: column; align-items: center; justify-content: center;"> <p>sickle cell anaemia</p> </div> <div style="border: 1px solid black; padding: 5px; width: 150px; height: 100px; display: flex; flex-direction: column; align-items: center; justify-content: center;"> <p>environment only</p> </div> <div style="border: 1px solid black; padding: 5px; width: 150px; height: 100px; display: flex; flex-direction: column; align-items: center; justify-content: center;"> <p>speaking English</p> </div> <div style="border: 1px solid black; padding: 5px; width: 150px; height: 100px; display: flex; flex-direction: column; align-items: center; justify-content: center;"> <p>genes only</p> </div> <div style="border: 1px solid black; padding: 5px; width: 150px; height: 100px; display: flex; flex-direction: column; align-items: center; justify-content: center;"> <p>intelligence</p> </div> <div style="border: 1px solid black; padding: 5px; width: 150px; height: 100px; display: flex; flex-direction: column; align-items: center; justify-content: center;"> <p>genes and the environment</p> </div> </div>	2	<p>all correct (2) 1 or 2 correct (1)</p>
	(b)	(i) nucleus (1)	1	
	(ii)	28 (1)	1	not 28 pairs not 14 pairs
		Total	4	

Question		Expected Answers	Marks	Additional Guidance
4	(a)	<p>any three from : (caused by) pathogens / bacteria / viruses / microorganisms / fungi (1)</p> <p>(destroyed by) white blood cells (1)</p> <p>(WBC) engulf (pathogen) (1)</p> <p>(WBC) make antibodies (1)</p>	3	<p>allow phagocytes (1) not red blood cells</p> <p>allow digest / consume / destroy bacteria (1) ignore attack / fight / kill / eat ignore germs</p> <p>allow antibodies deal with infection (1) but ignore antibodies engulf bacteria allow make antitoxins (1) allow antibodies join onto antigens (2)</p>
	(b)	<p>any one from: to check for side effects / check for harmful effects / to see if they are safe / AW (1) find the level of dose needed (1)</p>	1	<p>ignore see if they work / have an effect</p>
		Total	4	

Question		Expected Answers	Marks	Additional Guidance
5	(a)	eyes at front of the head <input checked="" type="checkbox"/> live in groups <input type="checkbox"/> sharp claws <input checked="" type="checkbox"/> warm blooded <input type="checkbox"/> feathers <input type="checkbox"/>	2	incorrect tick loses a mark
	(b)	(i) a plant or animal in danger of becoming extinct (1)	1	allow about to die out (1) allow idea of not many of them (1) ignore animal or plant will die ignore numbers going down
		(ii) any two from: habitat destruction (1) hunting (1) egg collecting (1) pollution (1) climate change (1) destroying food sources (1) bioaccumulation (1) introduction of disease (1)	2	ignore competition
	(c)	any two from: stop hunting / ban hunting (1) ban egg collecting (1) ban pesticides (1) build them nests (1) feeding stations / feed them (1) educational programmes (1) captive breeding / keep pairs together until they breed (1) creating artificial ecosystems / put in a nature reserve / conservation programme / protect habitat (1)	2	allow legal protection (1) if no mention of banning hunting / egg collection / pesticides ignore just keep in captivity / keep in a zoo (with no reference to breeding)
		Total	7	

Question		Expected Answers	Marks	Additional Guidance
6	(a)	(i) amphibian bird fish mammal reptile	2	3 correct (1) 4 or 5 correct (2)
		(ii) invertebrates	1	
	(b)	B and D	1	allow ringed answer on question
	(c)	(i) 16 (2) but 4 quadrats in $1m^2$ OR average per quadrat = 4 (1)	2	correct answer, no working = (2) allow correct answer in table allow working that clearly shows correct calculation, eg $1 / 0.25 = 4$ OR $40 / 10 = 4$ (1)
		(ii) 2560 (1)	1	allow ecf ie answer from (i) \times 160
		Total	7	

Question		Expected Answers	Marks	Additional Guidance
7	(a)	(i) fossil (1)	1	allow fossilised allow fossil fuels
		(ii) in tar (pits) / asphalt / amber / ice / peat (1)	1	allow in bog / in swamp allow frozen allow in a place where microbes don't cause decay ignore mud / clay / coal ignore just imprint / impression ignore unqualified reference to just acidic conditions
		(iii) older (no mark) because rocks at bottom of cliff face formed first (1)	1	allow it formed before rocks in layer B allow because rocks formed on top later allow its at the bottom / its lower down
	(b)	to make food / sugar / glucose / starch (1)	1	allow to grow ignore to live / so they don't die ignore so we get oxygen ignore energy
	(c)	water / light / space (1)	1	allow (sun) light ignore soil / minerals / nutrients
	(d)	any one from: the leaves look different / have different features (1) lived millions of years apart (1) have evolved (1)	1	allow they wouldn't look similar to each other (1) allow they lived in completely different eras / (geological) times (1)
		Total	6	

Question		Expected Answers	Marks	Additional Guidance
8	(a)	root grows down and shoot grows up (1) root grows towards gravity / away from light (1) shoot grows towards light / away from gravity (1)	3	allow drawings of root / shoot in correct directions allow roots grow towards water (1) allow shoots grow up to get more light / need more light (1) ignore reference to hormones allow high level answers eg shoots are phototrophic (1) eg roots are geotropic (1)
	(b)	fruit ripening (2 nd box) (1)	1	
	(c)	large number of beans per plant (2 nd box) (1) plants resistant to disease (4 th box) (1)	2	
		Total	6	

Question			Expected Answers	Marks	Additional Guidance
9	(a)	(i)	DNA (1)	1	
		(ii)	any two from: no tail / flagellum (1) can not swim (1) larger (1) fewer in number (1)	2	ignore female / not male assume unqualified answer refers to eggs allow higher level answers: only contain X chromosomes / contain food stores / no acrosome / more cytoplasm allow idea of different shapes (1) allow sperm have more mitochondria
	(b)	(i)	13 (1)	1	allow answer in range 12.0-13.5
		(ii)	11 (1)	1	allow answer in range 10.0-12.0
		(iii)	(height) stays the same / growth stops (1)	1	allow no change / nothing allow increases (very) slowly / very little ignore reference to shrinking (at old age)
			Total	6	

Question		Expected Answers	Marks	Additional Guidance
10	(a)	(i) split / divide embryo / AW (1) implant embryo(s) / clone(s) (into surrogate cows) / AW (1)	2	ignore just cells divide – must be clear it's the embryo splitting must be in correct sequence to get two marks, eg have second answer in first box (1) max
		(ii) can get more clones or many clones / could only get one or two from biological mother (if surrogates not used) / AW (1)	1	ignore just references to genetically identical allow more chance of success ignore just get more cows allow can keep using the same cow to produce more embryos allow avoid risk of 'best' cow dying in labour allow idea that to change a herd by selective breeding would take a long time
		(iii) cloning (1)	1	
	(b)	(i) oxygen / food / water (1)	1	allow O ₂ but not O allow named examples of soluble food eg amino acids allow antibodies / nutrients
		(ii) carbon dioxide / waste (1)	1	allow higher level examples eg urea ignore water / urine not faeces
		(iii) blood / (blood) plasma(1)	1	allow in blood vessels or named blood vessel ignore umbilical cord not blood cells
	(c)	mutation (1)	1	ignore just 'genetic change' allow higher level answers eg base change allow cow may have already been pregnant
		Total	8	

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