OCR
RECOGNISING ACHIEVEMENT

GCSE

Biology B

General Certificate of Secondary Education

Unit **B632/01:** Modules B4, B5, B6 (Foundation Tier)

Mark Scheme for June 2012

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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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Annotations

Annotation	Meaning
	correct response
	incorrect response
	benefit of the doubt
	benefit of the doubt **not** given
	error carried forward
	information omitted
	ignore
	reject
	contradiction

Subject-specific Marking Instructions

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

Question			Answer	Marks	Guidance
1	(a)	(i)	absorb / take in (sun) light (1)	1	**allow** make food / glucose / starch **ignore** to absorb sun
		(ii)	no light underground / roots cannot photosynthesise (1)	1	**allow** roots are underground / roots are in dark **allow** idea that (sun)light cannot get to roots **ignore** sun can't get to roots **ignore** they can't absorb sunlight
	(b)	(i)	yellow (leaves) (1)	1	**allow** pale green / yellowy green / yellowy orange / yellowy brown **ignore** 'pale' / discoloured **ignore** less growth (in question) / smaller **ignore** brown / orange
		(ii)	fertiliser (1)	1	**allow** manure / compost / magnesium salts / named magnesium salt **ignore** just **'**NPK' **ignore** just **'**minerals' **ignore** other named minerals e.g. phosphates
	(c)		make food / photosynthesise / convert light energy into chemical energy (1)	1	**allow** they produce food **ignore** they are producers
			Total	**5**	

Question			Answer	Marks	Guidance
2	(a)		**record / measure** how far / fast the bubble moves (1) description of how to change the light intensity (1) idea of control of other variables (1)	3	**allow** measure how much water is taken up **or** lost(1) **ignore** repeat with different light intensities unless qualified e.g. move lamp / repeat in the dark e.g. use the same plant / keep the temperature the same (1) e.g. place the apparatus in the light for set amount of time (1) **allow** make repeats at **each** light intensity (1)
	(b)		**any two from:** movement of food substances / sugar (and water) (1) through phloem (1) movement is up and down plant / AW (1) does not involve stomata **or** does not involve evaporation / loss of water **or** not affected by wind speed / humidity (1)	2	assume unqualified answers refer to translocation **allow** any named sugar **not** movement of minerals (negates first marking point) **ignore** nutrients (unclear if food or minerals) **ignore** other named foods e.g. starch **ignore** references to just water moving **not** phloem and xylem **ignore** just 'not affected by external factors' **ignore** not affected by temperature **allow reverse argument if it clearly refers to transpiration:** transpiration moves minerals (1) transpiration moves through xylem (1) transpiration is only up the plant (1) transpiration involves stomata / evaporation / water loss (1) **allow** additional mark for higher level answer referring to role of ATP / respiration / active transport (1) **ignore** just 'involves / needs energy'
			Total	**5**	

Question			Answer	Marks	Guidance
3	(a)	(i)	5 (%) (2) if answer incorrect 90 ÷1800 x 100 (1)	2	**allow** 0.05 (1) only if percentage sign is crossed out
		(ii)	(idea of energy being lost through) faeces / egestion / excretion / urine / respiration / movement / maintaining body temperature / not all parts eaten / not all organisms eaten (1)	1	**allow** clear examples of movement e.g. hunting **ignore** just 'waste' **allow** heat **allow** keeping warm **ignore** conduction / convection / radiation **not** growth (negates any mark)
	(b)	(i)	(decrease) less food (1)	1	**must be idea of less food not just shrews eat insects or insects have been killed** e.g. not enough food / not many insect to eat / killed of the insects which shrews feed on (1) **but** shrews eat insects **or** killed insects (0) **allow** correct ideas about bioaccumulation **ignore** kill them **allow** increase because they have more seeds to eat
		(ii)	(no) organic farmers don't use chemicals / insecticides (1)	1	**ignore** reference to man made substances **ignore** not using fertilisers **but allow** not using chemical fertilisers **allow** reverse argument e.g. farmer is using chemicals / pesticides
			Total	**5**	

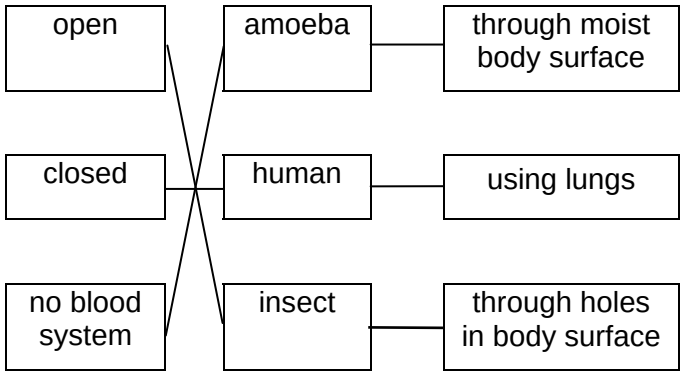
<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>4</td><td>(a)</td><td></td><td>
<table>
<tr><td>water is absorbed through the waxy cuticle</td><td></td></tr>
<tr><td>water evaporates from the leaves</td><td>✓</td></tr>
<tr><td>water enters the leaves through pores</td><td></td></tr>
<tr><td>water is needed to stop the plant wilting</td><td>✓</td></tr>
<tr><td>water is turned into oxygen during respiration</td><td></td></tr>
</table>
(2)
</td><td>2</td><td>minus one mark for more than two boxes ticked to a minimum of zero</td></tr>
<tr><td></td><td>(b)</td><td></td><td>biological (1)</td><td>1</td><td>allow predation</td></tr>
<tr><td></td><td>(c)</td><td></td><td>drying(1)
adding salt (1)
adding vinegar (1)</td><td>2</td><td>ignore freezing / cooling / adding sugar / canning / fridge / air tight container / put in a jar / put in dry place

allow pickling as an alternative to adding vinegar (1)
allow cooking (1)
allow bottling (1)
allow put in oil (1)</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>5</td><td></td></tr>
</table>

Question			Answer	Marks	Guidance
5	(a)		decreasing / getting thinner / breaking down / passing out of the vagina (1)	1	**allow** period / menstruation
	(b)	(i)	ovaries (1)	1	
		(ii)	joining / fusion of a sperm and an egg (1)	1	**allow** joining / fusing of (male and female) gametes **allow** sperm enters egg **ignore** egg and sperm meet
	(c)		Joanna (1)	1	more than 1 answer = 0
			Total	**4**	

Question			Answer	Marks	Guidance
6	(a)	(i)	X-ray (machine) (1)	1	**allow** CT machine / NMR
		(ii)	ball (and socket) (1)	1	**allow** synovial / universal joint (1) **ignore** moveable
		(iii)	ligament (1)	1	
	(b)		15(%)	1	
	(c)	(i)	suggest surgery AND the point 72,15 indicated on the graph (1)	1	**ON SCORIS, MARK THE UPPER ANSWER. THE LOWER QUESTION IS SHOWN TO ALLOW FOR ECF FROM (b)** **allow 1 for correct ECF** **need to see line(s) / cross / clear indication on graph to award mark**
		(ii)	**more likely** to advise reducing risk / **less likely** to suggest surgery (1)	1	**ignore** just 'advise reducing risk' **ignore** less likely to need surgery (as get older) **allow** less likely to get surgery (as get older)
			Total	**6**	

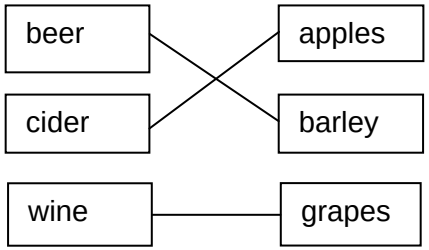
Question			Answer	Marks	Guidance
7	(a)	(i)	lung (1)	1	more than 1 answer = 0
		(ii)	respiration is releasing energy (from food) (1) breathing is movements that draw air in and out of the lungs (1)	2	**max one mark if they only describe respiration or breathing** **allow** idea of respiration being a chemical reaction e.g. correct equation for respiration(1) e.g. creates / makes carbon dioxide (and water) (1) e.g. **reacts** oxygen and glucose(1) **allow** happens in cells (1) **ignore** makes / creates energy **allow** exhaling and inhaling (air) **but not** exhaling carbon dioxide and inhaling oxygen **ignore** gas exchange
	(b)		kidney (1)	1	more than 1 answer = 0
	(c)		asthma / bronchitis / pneumonia / (lung) cancer (1)	1	**allow** asbestosis / cystic fibrosis / emphysema / TB / silicosis / COPD **ignore** other types of cancer e.g. throat / mouth cancer
			Total	**5**	

Question			Answer	Marks	Guidance
8	(a)			2	RHS correct = one mark LHS correct = one mark
	(b)	(i)	pulmonary artery (1)	1	
		(ii)	muscle (1)	1	
	(c)		(only) one atrium / ventricle (v two) / two chambers (v four) / one artery leaving (v two) (1)	1	assume unqualified answers refer to fish heart **allow** reverse argument if applies to human heart, e.g. human heart has two atria etc **allow** it doesn't have two atria / two ventricles / four chambers / two arteries **allow** it has no right ventricle / left ventricle / left atrium / right atrium (i.e. implies just one) **ignore** references to veins **ignore** references to thickness of ventricle wall **allow** one way only / single circulatory or humans are double circulatory
			Total	**5**	

Question			Answer	Marks	Guidance
9	(a)	(i)	(cell) wall (1)	1	**allow** slime / capsule **not** membrane
		(ii)	movement / AW (1)	1	**allow** to swim
		(iii)	nucleus / mitochondria (1)	1	**allow** chromosome(s) **ignore** vacuole **allow higher level answer** e.g. ER / Golgi bodies
	(b)	(i)	tuberculosis (1)	1	more than 1 answer = 0
		(ii)	tuberculosis (1)	1	more than 1 answer = 0 no ecf
		(iii)	800 (1)	1	
	(c)	(i)	rotting / decay / decomposition (1)	1	**allow** higher level answers: putrefaction / saprophytism **ignore** digests them / eats them / breakdown
		(ii)	plants (1)	1	**allow** denitrifying bacteria
			Total	**8**	

Question			Answer	Marks	Guidance
10	(a)		temperature was too high / temperature should have been lower (1) (biological washing) powder contains **enzyme**(s) / **enzymes** work best (at lower temperature) (1)	2	**allow** idea that he should have used a temperature in range 20-50 (^{o}C) **allow** higher level answer: enzymes denatured at high temperatures / 60 ^{o}C **ignore** kill enzymes mark both parts together
	(b)	(i)	reagent strip / clinistix / dextrostix / uristix (1) (reagent strip) changes colour (if glucose / sugar present)(1) **or** Benedict's test / heat with Benedict's solution (1) goes orange/red (if glucose / sugar present) (1)	2	**allow** stick for strip **allow** diabetes(test) strip / glucose (test) strip **but not** just 'test strip' /indicator strip **allow** specific colour change e.g. goes blue **allow** compare to scale **allow** taste urine (1) sweet (taste) if glucose / sugar present (1) for 2 marks both points must be correctly linked
		(ii)	remove **gene / DNA** from human (cell) (1) insert **gene / DNA** into bacteria (cell) (1)	2	only need to mention DNA / gene once e.g. remove **gene / DNA** from human (cell) insert into bacteria (cell) (2)
			Total	**6**	

Question			Answer	Marks	Guidance
11	(a)	(i)	all three points correctly plotted (30,38) (35,35) (40,6) (1) one smooth curve going through all 5 points (1)	2	**allow** +/- 0.5 small squares for both points and line **not** straight lines point to point **not** multiple lines **ignore** line before 20^{o}C and above 40^{o}C
		(ii)	Liz (no mark) (the best temperature) could be (just) below or (just) above 30 (^{o}C) **or** (the best temperature) could be anywhere above 25 and below 35 (^{o}C) / anywhere between 25 and 35 (^{o}C) (1)	1	If state Paul then score 0 **allow** (the best temperature) is close to / about 30(^{o}C) (but not exactly) **allow** any numbers > 25 and < 35(^{o}C) **allow** any range > 25 and < 35(^{o}C), e.g. 30-34 **but** the answer “any number from 25 to 35 (^{o}C)” = 0 **allow** Liz (no mark) not enough data (near optimum) **allow** Liz (no mark) only did experiment once so cannot be sure **allow** Liz (no mark) do not know margin of error
		(iii)	idea of (compromise between the need for a high rate of fermentation and) the costs incurred by maintaining a high temperature (1)	1	**allow** less energy / heat needed **ignore** just ‘cheaper’ / ‘more cost effective’ **allow** heat produced (during fermentation) **allow** so can control alcohol concentration / content **allow** so process completes in a known time (to prevent secondary fermentation in bottles) **ignore** just ‘control the rate of reaction’ **allow** to get less alcohol

Question			Answer	Marks	Guidance
	(b)	(i)	 (1)	1	all correct 1 mark
		(ii)	sugar (1)	1	**allow** named sugar **ignore** starch
			Total	**6**	

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