

GCSE

Biology B

Unit **B732/01**: Modules B4, B5, B6 (Foundation Tier)

General Certificate of Secondary Education

Mark Scheme for June 2014

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

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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1. Annotations used in scoris

Annotation	Meaning
	Blank Page – this annotation must be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.
	correct response
	incorrect response
	benefit of the doubt
	benefit of the doubt not given
	error carried forward
	information omitted
	ignore
	reject
	contradiction

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

- / = 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

MARK SCHEME

Question	Answer	Marks	Guidance
1 a	water (1) oxygen (1)	2	allow formulae if correct: H ₂ O (1) O ₂ (1)
b	through stomata (1) by diffusion (1)	2	allow pores ignore holes in leaves
c	more chlorophyll / more chloroplasts (1) to absorb more light / to absorb as much light as possible / because less light (to absorb) / more shading (1)	2	allow less access to sun(light) ignore cannot reach sunlight / sunlight cannot reach the plant not any reference to availability of gases or water
Total		6	

Question	Answer	Marks	Guidance
2 a	<div style="display: inline-block; vertical-align: middle;"> ☐ ☒ ☐ ☒ ☐ ☐ </div> nitrate (1) phosphate (1)	2	
b	provides minerals (1) when it decays (1)	2	allow specific examples e.g. nitrates ignore nutrients allow decomposes / breaks down (1) allow additional marking point: improves soil texture / aerates soil (1)
Total		4	

Question	Answer	Marks	Guidance
3	<p>[Level 3] Gives a full description of the experiment including the results. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Gives a description of the experiment. or Gives a partial description of the experiment with a description of the results. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Gives a partial description of the experiment or a description of the results Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to C</p> <p>Indicative scientific points about description at level 3 may include:</p> <ul style="list-style-type: none"> • compare mass loss at different fan speeds / distances • ideas of repeat readings • idea of with and without a plant shoot <p>Indicative scientific points about description at all levels</p> <ul style="list-style-type: none"> • measure transpiration by loss in mass • measure transpiration by loss of water from flask <p>Indicative scientific points regarding results may include:</p> <ul style="list-style-type: none"> • increasing air movement increases transpiration rate / loss of mass <p>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</p>
	Total	6	

Question	Answer	Marks	Guidance
4 a i	lacewings increase, aphids decrease or lacewings decrease, aphids increase or aphids decrease followed by lacewings decreasing (1) idea that lacewings eat aphids (1)	2	allow more lacewings, fewer aphids (1) fewer aphids followed by fewer lacewings (1) ignore actual data / aphids die out (but allow lacewings increase, aphids die) allow lacewings are predators of aphid OR aphids are prey / food supply of lacewings
ii	(growing buckwheat / graph B) does increases the number of lacewings (overall) (1) (growing buckwheat graph B) does decrease the number of aphids (overall) (1) but no evidence about crop yield / crop damage (1)	3	ignore buckwheat attracts lacewings (in question) allow reverse arguments for no buckwheat allow no evidence of crop damage allow for additional marking point if fewer aphids then (can assume) more crop yield / less crop damage (1)
b i	pooters (1) small / do not fly (1)	2	allow no wings need pooters to get second mark with the answer small / do not fly, however second mark can be scored in these ways: allow explanations why other methods are not suitable: not nets as do not fly / not pitfall traps as do not live on ground / not quadrats because move around
ii	nets (1) they fly (1)	2	allow have wings need nets to get second mark with the answer they fly, however second mark can be scored in these ways: allow explanations why other methods are not suitable: not pitfall traps as do not live on ground / not pooters because too big or delicate / not quadrats because move around
	Total	9	

Question	Answer	Marks	Guidance
5 a i	menstruation (1)	1	allow period ignore menstrual cycle
ii	pituitary (1)	1	allow phonetic spelling
b	blocked fallopian tubes	1	
	blocked sperm ducts		
	eggs not released		
	uterus lining will not accept a fertilised egg		
c i	25 (1)	1	
ii	24 (%) (1)	1	
iii	young women (1) women with low FSH levels (1)	2	If quote ages to treat then allow only treat women in a certain age range (must be a range between ages 20 to 44) allow only treat women under a stated age in the range 20 - 44 If quote levels to treat then allow only treat women in a certain range (must be a range between level 4 to 12) allow only treat women under a stated level in the range 4 - 12
	Total	7	

Question	Answer	Marks	Guidance
6 a	urea / water / salts (1)	1	ignore urine
b	accident / trauma / injury (1) infection / disease (1)	2	ignore they have been working too hard allow named disease or disorder eg diabetes / high blood pressure / low blood pressure / kidney stones / alcohol abuse / cancer of the kidney
	Total	3	

Question	Answer	Marks	Guidance
7	<p>[Level 3] Answer correctly calculates urine volume during the day before race. It also predicts one reason why one output may change during the race with a reason and link this to one change in input. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Answer correctly calculates urine volume during the day before race. It also predicts one change that may occur on the day of the race. OR Answer predicts one reason why one output may change during the race with a reason and link this to one change in input. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Answer correctly calculates urine volume during the day before race or predicts one change that may occur on the day of the race. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at G to C</p> <p>Indicative scientific points may include:</p> <p>during day before race:</p> <ul style="list-style-type: none"> • At rest Kaye is taking in 2500cm^3 • Therefore she must give out 2500 cm^3 • Her urine volume must be 1600 cm^3 <p>during day of race:</p> <ul style="list-style-type: none"> • during race she will sweat more / sweating will help to lose heat generated in race linked to: water will need to be replaced so likely to drink more <p>or</p> <ul style="list-style-type: none"> • during race she will sweat more / sweating will help to lose heat generated in race linked to: likely to pass less urine <p>Other predictions include:</p> <ul style="list-style-type: none"> • Respiration rate will increase during race • More water gain from respiration <p>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</p>
	Total	6	

Question	Answer	Marks	Guidance
8 a i	stomach (1)	1	
ii	liver (1)	1	
b	small intestine (1) food has been digested by this point / is digested here (1) glucose from food is absorbed here / passes through the lining of small intestine (1)	3	
	Total	5	

Question	Answer	Marks	Guidance
9 a	links (powerful) pump to the action of the heart (1) links gas exchanger to function of lungs (1)	2	allow idea that pump moves the blood around the body allow idea that in gas exchanger blood exchanges CO ₂ for O ₂ / removes CO ₂ / gains O ₂ inclusion of collecting tube negates mark
b	too much drug could stop blood clotting / too much blood may be lost from cut blood vessels (1) too little drug could make blood clot (in machine) (1)	2	ignore thins the blood if no other mark scored, allow one mark for a clear appreciation that blood clotting is affected
	Total	4	

Question	Answer	Marks	Guidance
10 a	enzymes (1)	1	
b i	dip the test strip in the urine (1) look at the colour of the test area / test area changes colour (1) compare with colour on label (1)	3	allow urinates on strip ignore tests her urine Compare the colour of the test area with the colour on the label / references to named colours on chart indicated named levels =2
ii	glucose in urine / medium level (of glucose) / concentration (of glucose) is medium (1) therefore person has diabetes (1)	2	
	Total	6	

Question	Answer	Marks	Guidance
11 a	air / water (1)	1	allow correct named gas / moisture allow minerals / named mineral
b i	particles of different density (1) but particles of greater density sink faster / further (2)	2	allow sand particles are heavier / clay particles lighter (1) allow sand particles are heavier and so sink faster / further ORA (2) for density allow mass / weight ignore references to size
ii	answer in range 34 - 36% (2) but reading in range 17 – 18 (mm) (1)	2	allow 1.7 – 1.8 but must say cm
iii	loam (1)	1	if answer is sandy then allow if % in (ii) is >55
	Total	6	

Question	Answer	Marks	Guidance
12 a	<p>kill (other) microorganisms / stop microorganisms entering (1)</p> <p>prevent production of other products / spoilage (1)</p>	2	<p>ignore stop microbes reproducing</p> <p>allow prevents contamination</p> <p>allow kill bacteria / fungi / so there are no microorganisms present</p> <p>ignore germs / bugs / viruses / stop bacteria</p> <p>allow change the product / reduce alcohol production</p> <p>allow idea that the microorganisms may be harmful</p> <p>allow (other microorganisms) compete for resources</p>

Question	Answer	Marks	Guidance
b	<p>[Level 3] Answer includes good description to conditions needed for fermentation. also includes reference to total alcohol made and rate of production. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Answer includes some of the conditions for fermentation and there is some description of the two graphs. or answer includes complete reference to conditions needed for fermentation. or includes reference to total alcohol made and rate of production. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Limited description of the conditions for fermentation is given or limited description of the graph. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at G to E grades</p> <p>Indicative scientific points about wine production may include:</p> <ul style="list-style-type: none"> • Alcohol is made by yeast • Fermentation • Absence of oxygen • Use of sugar • Allow higher level answers such as the equation for fermentation. <p>Indicative scientific points about batches may include:</p> <ul style="list-style-type: none"> • Alcohol content increases during fermentation and percentage alcohol levels off • Both make wine with same percentage /14% alcohol • Batch with no added sugar takes longer to finish fermenting / batch with added sugar ferments faster at beginning <p>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</p>
	Total	8	

Question	Answer	Marks	Guidance																				
13 a	<table border="1"> <thead> <tr> <th>Feature</th><th>Bacteria only</th><th>Yeast only</th><th>Both</th></tr> </thead> <tbody> <tr> <td>cytoplasm</td><td></td><td></td><td>(✓)</td></tr> <tr> <td>cell wall</td><td></td><td></td><td>✓</td></tr> <tr> <td>DNA</td><td></td><td></td><td>✓</td></tr> <tr> <td>flagellum</td><td>✓</td><td></td><td></td></tr> </tbody> </table>	Feature	Bacteria only	Yeast only	Both	cytoplasm			(✓)	cell wall			✓	DNA			✓	flagellum	✓			2	all correct rows (2) 2 correct rows (1) 1 or 0 correct rows (0)
Feature	Bacteria only	Yeast only	Both																				
cytoplasm			(✓)																				
cell wall			✓																				
DNA			✓																				
flagellum	✓																						
b	by budding / asexually (1)	1	ignore splitting into two / mitosis																				
c	drug A (1) because it has the largest area around it that is clear of bacteria (1)	2	allow kills more bacteria / microorganisms (1) answer must be comparative ie not just 'kills lots of microbes'																				
	Total	5																					

Question	Answer	Marks	Guidance
14 a i	7509 (1)	1	
ii	animals (1)	1	
iii	prokaryotes (1)	1	
b i	<p>any three from (ways they are similar:) idea that both graphs show an (overall) increase (1) idea that neither graph shows a smooth increase (1)</p> <p>(ways they are different:) graph for birds is levelling off / graph for beetles is still rising (1) the numbers for beetles are (far) greater than for birds (1)</p>	3	<p>allow in 1750 there were more birds recorded than beetles / beetles started from zero / beetles started from a lower number</p>
ii	<p>any two from these ideas</p> <p>birds are easier to spot / beetles are more difficult to spot (1)</p> <p>more people watch / are interested in birds than study beetles (1)</p> <p>birds migrate / move around more (1)</p> <p>beetle species are similar and only recently have people realised they are different species (1)</p> <p>there are more niches for beetles (1)</p> <p>beetles are older than birds and have had time to evolve into more species (1)</p> <p>identification/collection techniques (for beetles) has improved (1)</p>	2	<p>ignore descriptions of differences between the graphs with no explanations eg there are fewer bird species than beetle species</p> <p>allow birds are bigger than beetles</p> <p>allow people have been recording birds for longer</p> <p>allow beetles may live in places with few people</p>

Question	Answer	Marks	Guidance
c	<p>any two from these ideas (no) (no marks)</p> <p>a correlation does not prove causation (1)</p> <p>need more evidence (to prove) / could be other factors (causing extinction) (1)</p> <p>there is not a (complete) match between the two graphs (1)</p> <p>it could just be that we are better at recording extinctions now compared with 200 years ago (1)</p>	2	<p>yes = 0 marks</p> <p>allow there have always been extinctions so any match could be a coincidence</p> <p>allow human population is increasing exponentially but extinction is not /</p> <p>allow not much increase in extinctions in first 100 years although there is an increase in human population</p> <p>allow additional marking point graph may be from a bias source (1)</p>
	Total	10	

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