

Biology B

General Certificate of Secondary Education

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

Mark Scheme for January 2011

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

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1 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)	C (1)	1	more than one letter score (0)
	(b)	support (1)	1	ignore protection / gives shape allow stops bursting
	(c)	photosynthesis (1) chloroplasts (1) pores (1)	3	
	(d) (i)	roots / root hairs (1)	1	
	(ii)	potassium (1)	1	ignore K
		Total	7	

Question		Expected Answers	Marks	Additional Guidance
2	(a)	B (no mark) any two from: no / less water lost (1) water trapped inside bag / bag is waterproof (1) less evaporation / transpiration (1) higher humidity (1)	2	If A then no marks for question ignore needs more water / uses more water
	(b)	centre of X in cross at centre (1)	1	anywhere in shaded area allow correct label line 
	(c) (i)	(+)0.2 4.0 -0.1 3.9	2	4 correct including +/- = 2 marks 2 or 3 correct = 1 mark
	(ii)	any two from: water moves out / lost from the potato (1) through a partially permeable membrane (1) water moves from a solution that has a low(er) (sugar) concentration / ora (1) or water moves from a solution that has high(er) water concentration / ora (1)	2	allow semi permeable membrane (1) ignore semi permeable wall assume concentration refers to sugar concentration unless qualified allow water moves from dilute to concentrated solution (1) but water in the potato moves from dilute to concentrated solution (2) allow higher level answers e.g. correct idea of water potential (1)
		Total	7	

Question		Expected Answers	Marks	Additional Guidance
3	(a)	herbicide (1)	1	more than one answer ringed = (0)
	(b)	might not eat the knotweed fast enough / might eat his other plants / might compete with other organisms / might disrupt the food chain (1)	1	allow might not eat all the parts of the plant / might not completely remove knotweed allow might eat useful insects allow might fly away / may be eaten allow insects may become a problem if they have no natural predators / may become a pest allow go out of control allow takes longer (than herbicide) but ignore takes time ignore bad for / pollutes the environment ignore just might not work not bioaccumulation
	(c)	oxygen (1) moisture / water (1)	2	allow air (1) ignore food
	(d)	any two from: canning (1) freezing / cooling (1) drying (1)	2	allow cooking / turning into wine (1) allow description e.g. put in fridge (1) allow gamma radiation (1) ignore jam / add sugar ignore salt / vinegar / pickling but allow turn into chutney (1) allow (chemical) preservatives (1) ignore put into a container
		Total	6	

Question		Expected Answers	Marks	Additional Guidance
4	(a)	amoeba — closed human — open insect — none	2	3 correct (2) 1 or 2 correct (1) remove one mark for every extra line above three
	(b) (i)	sweat (1)	1	allow perspiration
	(ii)	plasma (1)	1	allow serum
	(iii)	A+ (1) B – (1)	2	each additional tick loses a mark to max of 2
		Total	6	

Question		Expected Answers	Marks	Additional Guidance
5	(a)	3 (years) (1)	1	allow three
	(b) (i)	$\frac{175 - 142}{4}$ or 33/4 (1) but answer 8.25 (2)	2	allow 8 / 8.3 (2) but 8.2 / 8.30 (1)
	(ii)	puberty / adolescence (1)	1	ignore teenager / youth
	(c) (i)	any one from: strong(er) (1) light(er) (1) can contain bone marrow (1)	1	allow less likely to break (1) ignore less brittle
	(ii)	X-rays (1)	1	each additional tick loses a mark to max of 1
	(d)	any one from: metal / plastic wears away (1) bone deteriorates around mechanical replacement / AW (1)	1	allow plastic / metal might break / get damaged allow body rejects material (1) allow does not grow with you (1) ignore rust / erosion /corrosion / rots /decay
		Total	7	

Question			Expected Answers	Marks	Additional Guidance
6	(a)	(i)	<u>coronary artery</u> (1)	1	
		(ii)	any two from: less blood flow (1) less oxygen (carried in blood)(1) less food (carried in blood) (1) waste products build up / not removed (1) (less oxygen / less food means) cells respire less (1)	2	ignore no oxygen / blood / food / respiration unless no oxygen / blood / food / respiration to the heart ignore kills heart / heart attack / makes heart work harder
	(b)		prevents clotting (1)	1	allow thins blood ignore prevent clogging
	(c)		any three from: pulse taken at (pressure point) in wrist / neck / groin (1) using (two) fingers / stethoscope / (digital) monitor (1) time measured with stopwatch / timer (1) count pulses over one minute / 15 seconds x 4 (1) record in beats per minute (1)	3	ignore arm / hand not thumb allow pulses per minute
Total				7	

Question			Expected Answers	Marks	Additional Guidance
7	(a)	(i)	nitrogen / carbon / sulfur / phosphorus / potassium / magnesium (1)	1	not water / carbon dioxide / nitrates allow oxygen allow correct symbol
		(ii)	anchorage / water (1)	1	allow stability ignore provides minerals
	(b)	(i)	2200 (1)	1	
		(ii)	provides minerals / nutrients (1)	1	allow improves water-handling allow named minerals / elements ignore fertilisers
		(iii)	they drag the compost under the soil / they aerate the soil / improve drainage / they mix up the soil layers / they neutralise acid soil / increase the surface area of compost (1)	1	ignore just make holes ignore they eat it allow breaking down compost
	(c)		(bacterial) gene is inserted into (cells of) tea plant (1)	1	
Total				6	

Question			Expected Answers	Marks	Additional Guidance
8	(a)	(i)	smaller / simpler (1)	1	allow higher level answers: lack a (true) nucleus / lack mitochondria / have flagella / only have one chromosome
		(ii)	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <i>Lactobacillus</i> can increase in numbers rapidly. </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <i>Lactobacillus</i> cannot move itself around. </div> <div style="border: 1px solid black; padding: 5px;"> <i>Lactobacillus</i> does not burst easily. </div> </div> <div style="display: flex; flex-direction: column; align-items: center; margin-left: 20px;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">It has a cell wall.</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">It does not have a flagellum.</div> <div style="border: 1px solid black; padding: 5px;">It can undergo binary fission.</div> </div>	1	
	(b)		B (1)	1	
	(c)		cheese / vinegar (1)	1	
Total				4	

Question			Expected Answers	Marks	Additional Guidance
9	(a)	(i)	any two from: (through the) skin (1) mouth (1) nose (1) reproductive organs (1)	2	allow injections / insect bites / cuts allow in food / water allow breathed in allow during sex allow ears (1)
		(ii)	antibiotic (1)	1	allow a specific antibiotic
	(b)	(i)	microscopic animals / tick in third box (1)	1	
		(ii)	pollution / acid rain (1)	1	allow named pollutant / sunlight / mineral availability / (number of) predators / (number of) phytoplankton / food / water flow
			Total	5	

Question		Expected Answers	Marks	Additional Guidance
10	(a)	needs to add yeast (1) fermentation / anaerobic respiration occurs (1) alcohol and carbon dioxide are made (1)	3	
	(b) (i)	distillation (1)	1	
	(ii)	it is illegal / needs a licence (1)	1	allow could produce a harmful product ignore dangerous / harmful ignore harmful effects of alcohol e.g. cirrhosis
		Total	5	

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