

**Biology B**

General Certificate of Secondary Education **B632/01**

Unit 2: Modules B4, B5, B6

**Mark Scheme for June 2010**

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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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**General advice to Assistant Examiners on the procedures to be used**

YOU WILL BE REQUIRED TO UNDERTAKE 10 PRACTICE AND 10 STANDARDISATION SCRIPTS BEFORE STARTING TO MARK LIVE SCRIPTS.

- 1 The schedule of dates for the marking of this paper is very important. It is vital that you meet these requirements. If you experience problems then you must contact your Team Leader (Supervisor) without delay.
- 2 An element of professional judgement is required in the marking of any written paper. Candidates often do not use the exact words which appear in the detailed sheets which follow. If the science is correct and also answers the question then the mark(s) should normally be credited. If you are in doubt about the validity of any answer then consult your Team Leader (Supervisor) by phone, the messaging system within Scoris or e-mail.
- 3 Correct answers to calculations always gain full credit even if no working is shown. (The 'Show your working' is to help candidates, who may then gain partial credit even if their final answer is not correct.)
- 4 Some questions may have a 'Level of Response' mark scheme. Any details about these will be in the additional guidance.
- 5 If an answer has been crossed out and no alternative answer has been written then mark the answer crossed out.
- 6 In addition to the award of 0 marks, there is a NR (No Response) option on Scoris.

Award 0 marks

- if there is any attempt that earns no credit (including copying out the question or some crossed out working)

Award NR (No Response)

- if there is nothing written at all in the answer space  
OR
- if there is any comment which does not in any way relate to the question being asked (eg 'can't do', 'don't know')  
OR
- if there is any sort of mark which is not an attempt at the question (eg a dash, a question mark)

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

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

8 Annotations: the following annotations are available on Scoris.

✓	= correct response
×	= incorrect response
bod	= benefit of the doubt
nbod	= benefit of the doubt <b>not</b> given
ECF	= error carried forward
^	= information omitted
I	= ignore
R	= reject
con	= contradiction

Highlighting is also available to highlight any particular points on the script.

The following questions should be annotated with ticks to show where marks have been awarded in the body of the text:

9 The Comments box

The comments box will be used by your PE to explain their marking of the practice scripts for your information. Please refer to these comments when checking your practice scripts. You should only type in the comments box yourself when you have an additional object of the type described in Appendix B of the Handbook for Assistant Examiners and Subject Markers.

Please do not use the comments box for any other reason.

Any questions or comments you have for your team leader should be communicated by phone, Scoris messaging system or e-mail.

10 Please send a brief report on the performance of the candidates to your Team Leader (Supervisor) by the end of the marking period. The Assistant Examiner's Report Form (AERF) can be found on the Cambridge Assessment Support Portal. This should contain notes on particular strengths displayed, as well as common errors or weaknesses. Constructive criticisms of the question paper/mark scheme are also appreciated.

Question		Expected Answers	Marks	Additional Guidance
1	(a)	oxygen (1)	1	
	(b)	(i) <b>any two from</b> cool / chill / keep cold (1)  freeze (1)  dry (1)  add vinegar / pickle (1)  add salt / sugar (1)	2	<b>allow</b> keep in fridge  <b>allow</b> keep in freezer  <b>allow</b> dehydrate  <b>ignore</b> lemon juice  <b>allow</b> turn into jam (1)  <b>allow</b> irradiate (1) vacuum pack (1) <b>ignore</b> airtight / pasteurise / UHT / antioxidants / preservatives
		(ii) <b>any one from:</b> kills bacteria / mould / fungi / microbes / decomposers / saprophytes (1)  stops oxygen / air / gasses getting to fruit (1)	1	<b>allow</b> sterilizes fruit <b>ignore</b> germs  <b>allow</b> stop microbes getting in
		<b>Total</b>	<b>4</b>	

Question		Expected Answers	Marks	Additional Guidance
2	(a)	artificial fertilisers are banned (1)	1	
	(b)	<p><b>any one from:</b></p> <p><b>(yes)</b> less land needed (1) more crops / cheaper to produce / higher yield (1)</p> <p><b>(no)</b> uses harmful chemicals (1) animals kept in cramped conditions / can't move around (1) diseases can spread more quickly (1) more mucking out / more clean bedding needed (1)</p>	1	<p>no mark for yes or no but must be correctly linked</p> <p><b>allow</b> grows quicker / bigger</p> <p><b>allow</b> larger environments in organic</p> <p><b>ignore</b> references to taste or better product</p>
	(c)	roots and leaves (1)	1	more than one tick no mark
		<b>Total</b>	<b>3</b>	

Question		Expected Answers	Marks	Additional Guidance
3	(a)	<p>flower = reproduction (AW) (1)</p> <p>chloroplasts = absorb light / photosynthesis / make food / contains chlorophyll (1)</p> <p>cell walls = support (1)</p>	3	<p><b>allow</b> attracts insects / makes pollen / makes ovules / fertilisation / makes fruit / makes seeds / pollination <b>not</b> makes scent / nectar unless qualified</p> <p><b>ignore</b> feeds plant</p> <p><b>ignore</b> let water / gases in or out <b>allow</b> holds plant up / for strength / stops cells bursting / maintains cell shape / cell structure <b>ignore</b> protects / keeps structure</p>
	(b)	<p><b>any three from:</b> absorbed / enters through root (hairs) (1) by osmosis (1)</p> <p>(transported) up the stem / trunk / branches (1) in xylem (1)</p> <p>by transpiration (1)</p> <p>evaporates / diffuses out of the leaves (1) through stomata / leaf pores (1)</p>	3	<p>must give the idea that enters, not just in roots</p> <p>must give direction, not just moves in stem</p>
	(c)	<p>increase in wind speed /</p> <p>lower humidity /</p> <p>increase in temperature (1)</p>	1	<p><b>must be comparative</b> <b>allow</b> windy <b>ignore</b> wind</p> <p><b>allow</b> gets drier <b>ignore</b> reference to rain <b>ignore</b> dryness</p> <p><b>ignore</b> warmth / heat / temperature</p>
	(d)	photosynthesis (1)	1	
		<b>Total</b>	<b>8</b>	

Question		Expected Answers	Marks	Additional Guidance
4	(a)	eats food / grass / producer (1)	1	<b>allow</b> cannot make own food / needs to feed / eats something <b>ignore</b> consumes food / grass <b>allow</b> comes second in food chain / comes after producer in food chain
	(b)	sun / light (1)	1	
	(c)	both bars drawn correctly (1)  cricket and bird labelled (1)	2	ignore asymmetry cricket = 5 squares +/- ½ square bird = must be less than one square <b>allow</b> if bird bar is one square wide but not as high as producer bar
	(d)	heat / respiration / egestion / excretion (1)	1	<b>not</b> growth / repair <b>allow</b> in faeces / urine / not all parts eaten / movement <b>ignore</b> waste / death <b>allow</b> any process that involves movement
		<b>Total</b>	<b>5</b>	



Question			Expected Answers	Marks	Additional Guidance
5	(a)	(i)	add up and divide by number of values / add up and divide by 3 / $48 \div 3$ (1)	1	
		(ii)	$16 \times 4$ (1) BUT 64 (2)	2	correct answer, no working = 2
		(iii)	heart beat / heart pumping / heart contracting / heart muscle contracting (1)	1	<b>allow</b> higher level answers eg ventricles contract / arteries recoil <b>allow</b> change of blood flow / pressure (in artery) <b>not</b> vein <b>ignore</b> heart
	(b)	(i)	red blood cell (1)	1	
		(ii)	plasma (1)	1	
		(iii)	white blood cell (1)	1	
			<b>Total</b>	<b>7</b>	

Question		Expected Answers	Marks	Additional Guidance
6	(a)	chitin (1)	1	
	(b)	(i) respiration / release energy (from food) (1)	1	<b>ignore</b> to live / to breathe / for energy / for respiratory system
		(ii) one from: have external skeleton (1) skin / chitin / body not moist / not permeable (1)	1	<b>not</b> shells
		(iii) (through) skin / over body surface / by diffusion (1)	1	<b>allow</b> all over the body <b>not</b> reference to holes
	(c)	(i) A (1)	1	
		(ii) earthworms don't have puberty / adolescence / growth spurts / ORA (1)	1	<b>allow</b> idea that in humans growth is not constant
		(iii) mitosis (1)	1	mark phonetically
<b>Total</b>			<b>7</b>	

Question		Expected Answers	Marks	Additional Guidance	
7	(a)	<p><b>any three from:</b></p> <p>homeostasis ideas: regulate water loss / control blood concentration / removes excess water / removes excess salts (1)</p> <p>filter <b>blood</b> (1)</p> <p>(at high) pressure (1)</p> <p>re-absorb water / useful substances (1)</p> <p>remove urea / waste products from blood (1)</p> <p>make urine (1)</p>	3	<p><b>ignore</b> filter fluids</p> <p><b>allow</b> 'ultrafiltration' = 2</p> <p><b>allow</b> named examples eg sugar / amino acids / salts</p> <p><b>ignore</b> clean blood / remove waste from body</p> <p><b>ignore</b> excretes urine</p>	
	(b)	(i)	<p><b>two from:</b></p> <p>tissue match / same DNA / same blood group / same genes(1)</p> <p>same / similar size / same age (1)</p> <p>he knows his brother's health / lifestyle (1)</p> <p>avoids waiting lists (1)</p>	2	<p><b>allow</b> not rejected / will not need so many anti rejection drugs but</p> <p><b>ignore</b> similar</p>
		(ii)	(kidney machines are) too big (1)	1	
<b>Total</b>			<b>6</b>		

Question		Expected Answers	Marks	Additional Guidance
8	(a)	fungus (1)	1	
	(b)	(i) carbon dioxide (1)	1	<b>allow</b> correct formula
		(ii) apples (1)	1	<b>allow</b> pears
	(c)	(i) petrol (1)	1	<b>allow</b> gasoline / petroleum
		(ii) <b>any three from:</b> happens in a digester (1)  organic waste is acted on by bacteria (1)  bacteria cause rotting / organic waste is rotted / decomposed (1)  methane is made (from waste) / biogas contains methane (1)	3	organic waste is rotted by bacteria to release methane = 3 marks  bacteria rots waste = 2
<b>Total</b>			<b>7</b>	

Question			Expected Answers	Marks	Additional Guidance
9	(a)	(i)	dead / decaying / rotting material (1)	1	<b>allow</b> dead / decaying / rotting plants / animals / animal waste / organic waste
		(ii)	rock / sand / clay / silt / stones / air / water / minerals / nutrients (1)	1	<b>allow</b> named gas / mineral / N / P / K / acid <b>not</b> litter / plastic / fertilizer
	(b)	(i)	live plants → <b>wireworm</b> → <b>centipede</b> dead plant material → <b>earthworm</b> (1)	1	
		(ii)	they make burrows that let oxygen into the soil (1)	1	more than one tick no mark
			<b>Total</b>	<b>4</b>	

Question		Expected Answers	Marks	Additional Guidance
10	(a)	0.002 mm (1)	1	
	(b)	(using their) flagellum (1)	1	ignore tail
	(c)	antibiotics (1)	1	ignore antibacterial ignore named antibiotic
	(d)	erupting volcanoes / earthquakes / floods / mudslides / tsunamis / tornados / hurricanes (1)	1	not war / drought
		<b>Total</b>	<b>4</b>	

Question		Expected Answers	Marks	Additional Guidance
11	(a)	GM plants have had their DNA changed (1)	1	
	(b)	<p>(i) crops / the growth / area is increasing (in both types of countries/ in the world ) (1)</p> <p><b>but</b> the growth / the increase in developing countries is faster = (2)</p> <p>the proportion of the whole world GM production is becoming more equally split between developing and developed countries (1)</p> <p>growth in developed countries is (always) higher than in developing countries (1)</p>	2	<p><b>allow</b> the countries are increasing <b>ignore</b> it / they / both / all are increasing</p> <p>ORA</p> <p><b>allow</b> the countries are becoming the same</p> <p>ORA</p>
		(ii) developing countries grew less than 58 (52 – 57) (million hectares in 2007) (1)	1	<b>not just</b> developed countries grew 60 million <b>allow</b> the crops / the growth / area in developing countries did not reach that high
		(iii) maize / cotton / corn / canola (1)	1	<b>allow</b> tomatoes
		<b>Total</b>	<b>5</b>	

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