

Mark Scheme (Results)

January 2013

International GCSE
Biology (4BI0) Paper 2B

Edexcel Level 1/Level 2 Certificate
Biology (KBI0) Paper 2B

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk for our BTEC qualifications.

Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

If you have any subject specific questions about this specification that require the help of a subject specialist, you can speak directly to the subject team at Pearson.

Their contact details can be found on this link: www.edexcel.com/teachingservices.

You can also use our online Ask the Expert service at www.edexcel.com/ask. You will need an Edexcel username and password to access this service.

Pearson: helping people progress, everywhere

Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

January 2013

Publications Code UG034268

All the material in this publication is copyright

© Pearson Education Ltd 2013

Question number	Answer	Notes	Marks
1 (a)	<p>DNA / part of a chromosome / eq;</p> <p>codes for protein / makes protein / determines characteristic / determines named characteristic / eq;</p> <p>(b) (release/ produce) lots of eggs / more eggs / ovulate more / eq;</p> <p>(c) uterus / womb;</p> <p>(d) smoking / (having) cigarette / (having) tobacco;</p> <p>(e) <u>50 (%)</u>;</p> <p>(f) (i) protein/blood clotting factor digested/destroyed (by acid) / eq;</p> <p>(ii) glucose;</p> <p>(more) respiration / energy / ATP;</p> <p>milk / meat production / growth / eq;</p> <p>(g) <u>transplant</u> / <u>transplantation</u>;</p> <p>(more) hearts available / less shortage / less waiting time / no need for donors / few donors / lowers demand / eq;</p> <p>less immune response / less rejection / human proteins / human DNA / human genes / tissue type / better match / compatible / eq;</p> <p>less deaths / live longer / eq;</p>	<p>need idea of larger quantity</p> <p>allow broken down ignore need to separate from milk ignore sugar</p> <p>ignore work for longer / reduce heart attacks</p>	<p>2</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>2</p> <p>3</p>
Total			12

Question number	Answer	Notes	Marks										
2 (a)	120 to 136;; within range of 60 to 68 = 1 an indication of times 2 = 1	any number in working times 2 = 1 eg. 50 x 2 = 100 gets one mark	1										
(b)	0.00138 / 0.0014 / 1.38×10^{-3} ;; allow one mark for 0.2/6 or 0.03(3) or 0.2/24 or 0.008 in working		2										
(c)	surface (area) covered or exposed / side of leaf covered or exposed / place where jelly put / eq;	ignore quantity of jelly	1										
(d)	(loss of) mass / weight;		1										
(e)	light / wind / humidity / temperature / time / species / eq;		1										
(f) (i)	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Mass lost</th> <th>Leaf</th> </tr> </thead> <tbody> <tr> <td>Most</td> <td>A</td> </tr> <tr> <td></td> <td>C</td> </tr> <tr> <td></td> <td>B</td> </tr> <tr> <td>Least</td> <td>D;;</td> </tr> </tbody> </table>	Mass lost	Leaf	Most	A		C		B	Least	D;;	if wrong order then allow one mark for A before D OR C before B	2
Mass lost	Leaf												
Most	A												
	C												
	B												
Least	D;;												
(ii)	stomata; (more) on lower surface / (fewer) on upper surface / eq; A no surface covered most mass lost /water lost C upper surface covered next most mass/water lost B lower surface covered less mass /water lost D both surfaces covered least mass /water lost sensible link between leaf coverage and loss of mass/water;	ignore guard cells allow converse between surface exposed and mass lost	3										
		Total	12										

Question number	Answer	Notes	Marks
3 (a)	temperature recorder / eq; cooling jacket / cooling water / water in if hot / eq;		2
(b)	respiration produces heat; enzymes; denatured / destroyed / eq; optimum; best growth / maximum growth / more product / eq; microorganisms killed / eq;		2
(c)	mixing / distributing oxygen / air; for respiration; mixing / distributing nutrients / microorganisms; for growth; mixing / distributing heat / temperature; for respiration / enzymes;	mix air and heat = 2	2
(d)	pH / acidity / alkalinity; <u>enzymes</u> ; oxygen; <u>respiration</u> ; (other) microorganisms / sterility; competition / contamination / less product / eq;	mark in discrete pairs ignore air	2
(e)	insulin / penicillin / antibiotic / <i>Fusarium</i> / mycoprotein / any named GM product / eq;	ignore bacteria / fungus / cheese / yoghurt / beer / ethanol / medicine	1
		Total	9

Question number	Answer	Notes	Marks
4 (a) (i)	B;		1
(ii)	A;		1
(iii)	C;		1
(b) (i)	zygote;		1
(ii)	mitosis ;		1
(iii)	diploid with 46 chromosomes;	ignore tick cross hybrid two ticks present = 0	1
(c)	placenta; from mother's blood; diffusion / high conc. to low conc.; large surface area / thin / eq; <u>umbilical</u> cord;	ignore gas exchange / ignore carried	3
		Total	9

Question number	Answer	Notes	Marks
5 (a)	cell membrane; cytoplasm; plasmid; nucleoid / chromosome / DNA once;	reject nucleus / nucleolus ignore vacuole / ribosomes / mitochondria	3
(b) (i)	enzymes; <u>optimum</u> ; denatured / destroyed / eq;	ignore references to low pH and high pH	2
(ii)	amino acids; protein / DNA;		2
(iii)	active transport / active uptake; low to high conc. / against conc. gradient / eq; respiration / energy / ATP; root <u>hair</u> (cells); large surface area / eq;		3
(c) (i)	X at 100;	allow any indication at 100	1
(ii)	11.1%;; allow one mark for 8000 or 7200 or 800 in working		2
(iii)	nitrate (already) in soil / <u>nitrogen fixing</u> bacteria / nitrification / organic material in soil / eq;		1
		Total	15

Question number	Answer	Notes	Marks
6 (a)	<p>smaller surface area to volume ratio;</p> <p>less heat loss / more energy measured / eq;</p> <p>heats up slowly / avoid boiling / eq;</p>	accept converse	2
(b)	<p>insulation / lid / cover / eq;</p> <p>less heat/energy loss;</p> <p>burning food close to tube / eq;</p> <p>less heat/energy loss;</p> <p>quick transfer of burning food / eq;</p> <p>less heat/energy loss;</p> <p>stir / eq;</p> <p>even temperature;</p> <p>avoid draft / wind;</p> <p>less heat/energy loss;</p> <p>digital thermometer ;</p> <p>precision / eq;</p> <p>use calorimeter / burn in oxygen;</p> <p>all food burnt / less heat/energy loss;</p>	<p>mark in discrete pairs</p> <p>reject idea of more bread</p> <p>ignore repeat</p>	2
		Total	4

Further copies of this publication are available from
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467

Fax 01623 450481

Email publication.orders@edexcel.com

Order Code UG034268 January 2013

For more information on Edexcel qualifications, please visit our website
www.edexcel.com

Pearson Education Limited. Registered company number 872828
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE

Ofqual




Llywodraeth Cynulliad Cymru
Welsh Assembly Government

