OCR
RECOGNISING ACHIEVEMENT

GCSE

Biology B

General Certificate of Secondary Education

Unit **B631/02:** Modules B1, B2, B3 (Higher Tier)

Mark Scheme for June 2011

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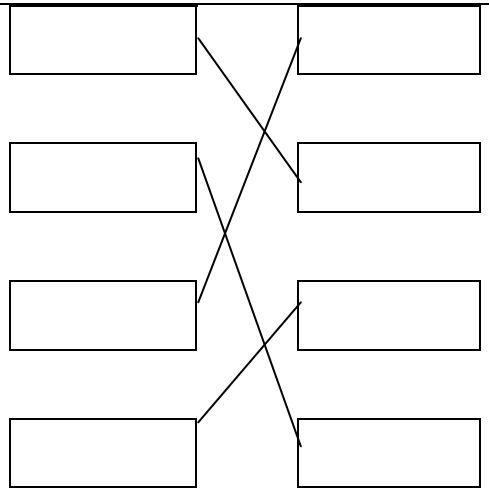
1 The **Abbreviations, annotations and conventions** used in the detailed Mark Scheme are:

/ = 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
__ = 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	i	retina (1)	1	**allow** rods / cones
		ii	sensory (neurones) (1)	1	
	b	i	an alternative version of a gene / AW (1)	1	**not** different genes **allow** examples eg T and t are alleles for height
		ii	they are different (1)	1	**allow** e.g. Rr **allow** one is dominant one is not **allow** one allele is faulty, one is not **allow** have (two) different alleles
			Total	**4**	

Question			Expected Answers	Marks	Additional Guidance
2	a	i	carbon monoxide (1)	1	**allow** CO **not** Co
		ii	(it is the chemicals in the) tar that cause (lung) cancer / less chance of cancer (1)	1	**allow** reference to other valid diseases eg emphysema / bronchitis / COPD
	b	i	synapse (1)	1	
		ii	by the **diffusion** of (neuro)**transmitters** (1)	1	**allow** named transmitter
	c		the higher the number of cigarettes smoked the smaller the birth weight / mass / ora (1) idea of considerable variation / scattering of results (1)	2	**allow** negative correlation / inversely proportional
			Total	**6**	

Question			Expected Answers	Marks	Additional Guidance
3	a		contains **most / more** vitamin C (1)	1	**ignore** has a lot of vitamin C 'has most iron and vitamin C' = 0 (con) **allow** most / more vitamin
	b		RDA is 39(g) (1) diet gives her 45(g) (1)	2	**allow** diet gives 6(g) more than RDA (2) if just give 39 and 45 (1)
	c		they contain **all** the essential amino acids / the amino acids that the body can't make (1)	1	**ignore** they contain more amino acids / they are first class proteins / contains amino acids that are needed
	d		idea that may lead to low self-esteem / poor self image / depression / AW (1) may lead to poor diet / deficiencies / anorexia (1)	2	**ignore** simply the idea that people may think they need to lose weight **allow** underweight **allow** may lead to extreme diets / surgery **allow** girl in advert is young / advert is targeting young people (1)
			Total	**6**	

Question			Expected Answers	Marks	Additional Guidance
4	a			2	four correct = 2 marks two / three correct = 1 mark one correct = zero more than 4 lines deduct 1 mark for each extra line (min zero)
	b		tick in second box (1)	1	
	c		concave (lenses) (1)	1	**allow** diverging (lenses) **allow** correct diagram
			Total	**4**	

Question			Expected Answers	Marks	Additional Guidance
5	a		backbone (1) milk (1) binomial / scientific (1)	3	**allow** vertebrae / spine / internal skeleton / bony skeleton **but not** (spinal) cord **allow** fur / live young / mammary glands **allow** Latin / species / specific
	b	i	idea of fish quota (1)	1	**allow** reduce pollution in sea / water **allow** protect habitat / fewer trawlers / fewer fishing boats / larger holes in net / fish farms / exclusion zones / return smaller fish / reduce fishing season / fish somewhere else / captive breeding / catch alternative species **ignore** ban fishing **ignore** just 'breed' BUT **allow** breeding programme
	b	ii	idea of one country setting a quota / net size / exclusion zone but another ignores it (1)	1	**allow** countries need to agree on total catch then divide it fairly **allow** idea that sea is not owned by any one country (so none has more rights than another) **allow** idea that one country won't make a difference
			Total	**5**	

Question			Expected Answers	Marks	Additional Guidance
6	a		3.0 (2) **but if answer is incorrect** total = 24 **or** incorrect total ÷ 8 (1)	2	**allow** 3 (2) **allow** if nothing written on answer lines look in table
	b	i	**any two from:** idea of dog whelks most abundant where their food source is (1) idea of desiccation on upper shore (1) more predators on upper shore (1)	2	 eg the dog whelks will be where their food is eg they dry out because uncovered longer **ignore** just it's wetter nearer the sea (ie need consequence for whelks) **ignore** human impact **ignore** pollution
	b	ii	only a small sample size (1) may not be placed at random / may not represent the whole area / may have missed a section with more or less whelks in (1)	2	**allow** small quadrats / small number of results **allow** not enough results / repeats / samples / quadrats **allow** reasons for small sample size eg tide came in too fast to count them all **allow** only sampled at one time of day / year
			Total	**6**	

Question			Expected Answers	Marks	Additional Guidance
7			**any two from:** feathery stigma (1) to catch pollen (1) small / light pollen (1) to float in the wind (1)	2	**allow** two descriptions **allow** one description (1) and an associated explanation (1) **not** explanation marks only **allow** pollen not sticky (1) individual grains can be blown away (1) **allow** anthers hang out (1) so pollen caught in wind (1) **allow** stigmas hang out (1) to catch pollen (1) **allow** no petals (1) so wind can easily blow pollen away (1) **ignore** any references to seeds
			Total	**2**	

Question			Expected Answers	Marks	Additional Guidance
8	a	i	correct formula and balanced (2) $6CO_2 + 6H_2O \longrightarrow (C_6H_{12}O_6) + 6O_2$ either order **but** correct formula (1) correct balancing (1)	2	balance mark dependent on correct formula BUT **allow** one mark for correct balanced equation with incorrect use of lower case for C and O e.g. $6Co_2 + 6H_2o \longrightarrow (C_6H_{12}O_6) + 6O_2$
	a	ii	cellulose (1) for cell walls / support (1) OR fats / oils (1) for storage / water proofing / buoyancy (1) OR protein (1) for growth / repair (1)	2	use must match named molecule to award second mark **ignore** starch (in question) **allow** makes leaves / makes new roots etc as alternative to growth **allow** other molecules eg chlorophyll / amino acids / vitamins / sucrose plus correct use sugar / glucose = 0 but can award second mark for energy / respiration / make ATP / active transport / make nectar (1)
	b		preserved in amber / peat bog / tar pits / ice (1)	1	**allow** glaciers / tree sap / frozen **ignore** casts / impressions / desiccated **ignore** swamps **ignore** description of conditions e.g. lack of oxygen / microbes **ignore** implication that humans responsible e.g. put in freezer / mummify
			Total	**5**	

Question			Expected Answers	Marks	Additional Guidance
9			longer the tooth / tusk more likely to breed / mate (1) inheritance of longer tooth or tusk / bigger tusks more frequent in population (1)	2	**ignore** longer the tooth / tusk more likely to attract mate (in question) **allow** longer tooth / tusk has a selective advantage **ignore** references to survival eg passed on the longer tooth characteristic
			Total	**2**	

Question			Expected Answers	Marks	Additional Guidance
10	a		tick in second box	1	If more than 1 tick, no mark
	b	i	14 (months)	1	**allow** +/- half a month
	b	ii	11.1(%) (2) BUT 5 x 100 (1) 45	2	**allow** 11 (2)
	b	iii	provides early warning of growth / development problems / ORA (1)	1	**allow** check baby is growing properly **allow** Zoë is outside the normal range **allow** early signs allow more rapid treatment / intervention idea **ignore** just 'check for problems'
	c	i	radiation / chemicals / spontaneous (1)	1	**allow** mutagen **allow** higher level responses: ionising radiation / UV / X ray / gamma / correct carcinogens e.g. tar / cigarette smoke **ignore** 'drugs'
	c	ii	changes (DNA) base sequence (1)	1	**allow** specific examples eg C replaced by T **ignore** alters genes / alters bases / wrong bases **allow** alters base code / eg C becomes T **allow** description of chromosome mutations
		iii	change / prevent production of protein (1)	1	**allow** changes amino acids in protein
			Total	**8**	

Question			Expected Answers	Marks	Additional Guidance
11	a		diffusion	1	**allow** higher level descriptions of diffusion
	b	i	**mitochondria** provide energy (to swim / move to egg) (1) **acrosome** releases enzymes OR digest egg membrane (1)	2	**allow** mitochondria release energy / site of respiration / make ATP **not** digests (cell) wall BUT releases enzymes to digest wall = 1 **ignore** eats egg membrane
	b	ii	meiosis (1)	1	mark phonetically, do **not** give mark if contains a 't' **allow** reduction division
	c		haploid	1	**allow** underlining of haploid
	d		(large) single cell has smaller surface area to volume ratio so reduced movement of substances in and out of the cell (1)	1	
			Total	**6**	

Question			Expected Answers	Marks	Additional Guidance
12	a		**any one from:** be sure of characteristics (1) can mass produce if seeds difficult to cultivate (1)	1	 **allow** will always get the same colour flower **allow** you know what you will get **ignore** just they're the same **allow** genetically identical **allow** can still grow them if seeds difficult to grow **ignore** cost **allow** it's quick(er)
	b	**i**	prevent infection OR stop microbes / bacteria / fungi / viruses (1)	1	
		ii	auxins (normally) made in **tips** of shoots / roots (1)	1	**allow** no tips **allow** gene (for auxin) switched off
		iii	**any two from:** mitosis (1) chromosomes are copied (1) segregate into 2 groups / each group moves to opposite poles (1)	2	 **allow** chromosomes / DNA replicate / duplicate **allow** chromosomes separate **allow** higher level answers with correct reference to chromatids
	c		plant (cells) retain ability to differentiate / form new types OR animal (cells) lose ability to differentiate / form new types (early in development) (1)	1	
			Total	**6**	

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