OCR
Oxford Cambridge and RSA

GCSE

Biology B

Unit **B731/01**: Modules B1, B2, B3 (Foundation Tier)

General Certificate of Secondary Education

Mark Scheme for June 2014

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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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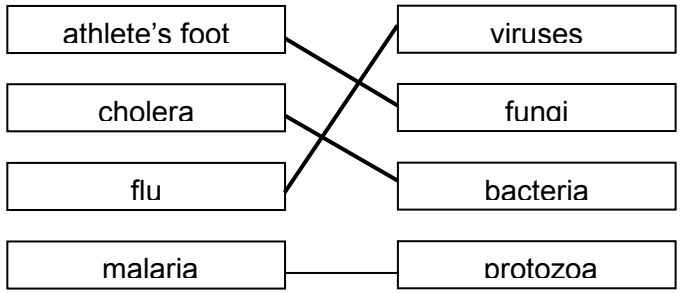
Annotations used in scoris

Annotation	Meaning
	correct response
	incorrect response
	benefit of the doubt
	benefit of the doubt **not** given
	error carried forward
	information omitted
	ignore
	reject
	contradiction

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		2	all correct = 2 marks 1 or 2 correct = 1 mark (ignoring malaria-protozoa)
b	heat stroke (1) dehydration (1)	2	**ignore** just 'stroke' **allow** hyperthermia **allow** insufficient water to remove toxins **allow** higher level answers e.g. damage to enzymes / stops enzymes working / denatures enzymes (1) **allow** preventing chemical reactions happening (1) **ignore** kills enzymes **ignore** burn or body becomes too hot or overheats **ignore** damage to any body part e.g.organ failure
	Total	**4**	

Question	Answer	Marks	Guidance
2 ai	carbohydrate / fat (1)	1	**allow** sugars / starch / oils / lipids **ignore** named sugars e.g. glucose
aii	EAR = 7.2 (g) (1)	1	**allow** 0.0072 kg **allow** 7.20 (g)
aiii	65% (1)	1	more than one answer ringed = 0 **allow** answer underlined or ticked **allow** ECF from part (ii)
b	(faulty) gene / inherited (1)	1	**allow** (faulty) allele **allow** (faulty) DNA **allow** mutation **allow** higher level answer: recessive allele **ignore** from parents BUT inherited from parents =1
c	**any two from** treatment might not work (1) treatment might cause harm / have side effects / AW (1) treatment done at expense of normal treatment (1) ethical issues about experimenting on children / AW (1)	2	**allow** might cause an allergy / reaction / death **ignore** has an effect **allow** unethical **allow** litigation (1)
	Total	6	

Question	Answer	Marks	Guidance
3 a	height / weight are (controlled)(by genes and) environmental factors (1) eye colour is (only) controlled by genes / is inherited /(1)	2	**allow** example of valid environmental factor e.g. John eats more / has better diet / eats more protein e.g. idea of James having an illness **ignore** from parents BUT inherited from parents =1
b	both have *same* genes / *same* DNA (1)	1	**allow** same alleles
	Total	3	

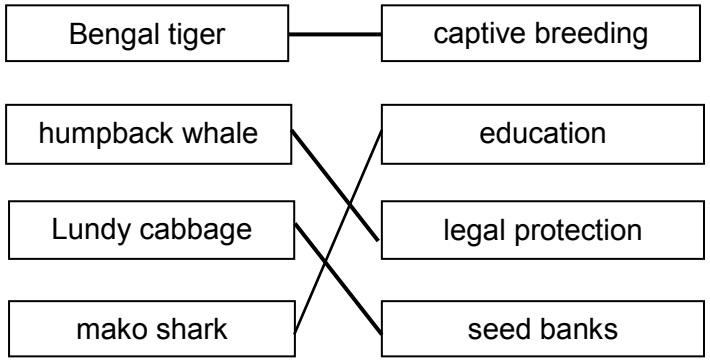
Question	Answer	Marks	Guidance
4 a	**any two from** overall the number of deaths decreases (1) males have more deaths than females (1) initial increase in deaths in males (1) later *great* decrease in male deaths (1) initially female death rate is (relatively) stable (1) later *slight* decrease in female deaths (1)	2	**ignore** references to heart disease **allow** male deaths decrease / female deaths decrease
b	27 years (1)	1	more than one answer = 0 **allow** answer underlined or ticked
c	**max 2 marks for reducing risk factors** improvements in diets / eating less salt / eating less saturated fat (1) less smoking (1) more exercise (1) better health care for patients (with heart disease) (1) better health education (1) **plus one/two from** improvements reducing risk factors in males will have bigger effect as more males are affected in first place / AW (1)	3	**allow** better diets in recent year / skimmed milk / low cholesterol alternatives to butter / drinking less alcohol **ignore** eat better **allow** e.g. people's diets have improved by eating less saturated fat **because** this blocks the arteries supplying blood to the heart (2) e.g. less salt **because** it raises blood pressure (2) **allow** e.g. less smoking **because** it raises blood pressure (2) **allow** more active **allow** statins **ignore** people are healthier / healthier lifestyles **allow** females less affected by heart disease than males / RA (1) **ignore** women have healthier diets/smoke less etc than men
	Total	6	

Question	Answer	Marks	Guidance
5	**[Level 3]** Ethylene causes bananas to ripen / become more yellow **and** (ethylene is used before bananas are sold) to avoid bananas becoming over-ripe or damaged on journey / ripen bananas for the shops to sell **and** ripe bananas release ethylene Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Ethylene causes bananas to ripen / become more yellow **plus either** (ethylene is used before bananas are sold) to avoid bananas becoming over-ripe or damaged on journey / ripen bananas for the shops to sell **or** ripe bananas release ethylene Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Ethylene causes bananas to ripen / become more yellow Quality of written communication impedes communication of the science at this level. (1 – 2 marks) **[Level 0]** Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)	6	**This question is targeted at grades up to C.** **allow** sweeter / softer as alternatives to more ripe **allow** hormone as alternative for ethylene if only refer to chemical / gas then limited to 5/3/1 marks **Use the L1, L2, L3 annotations in Scoris. Do not use ticks.**
	Total	**6**	

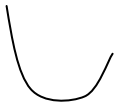
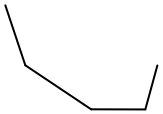
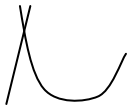
Question	Answer	Marks	Guidance
6 a i	arachnids ☐ crustaceans ✓ insects ☐ myriapods ☐	1	more than one answer = 0 **allow** other unambiguous answers, e.g. X in box, underlining, circle
a ii	family ☐ genus ☐ kingdom ☐ order ☐ phylum ☐ species ✓	1	more than one answer = 0 **allow** other unambiguous answers, e.g. X in box, underlining, circle
b i	3 (1) (rock pools in) middle zone (1)	2	**allow** answer for average in table **allow** ECF for second mark if incorrect mean calculated if no mean calculated **allow** second marking point
b ii	**any two from** more food / AW (1) fewer predators (1) more places to hide from predators (1) bigger rock pools (1) more stable temperature (than upper shore) (1) less chance of desiccation (than upper shore) (1)	2	**ignore** better habitat / better conditions / better place for breeding / safer / more shelter / more protection **allow** fewer people catching crabs **allow** more rock pools
	Total	6	

Question	Answer	Marks	Guidance
7 a i	CFCs (1) aerosols / refrigeration (1)	2	if mention global warming / greenhouse gases max 1 mark **allow** (ozone) is broken down to oxygen / reacts to form oxygen (1)
a ii	South America (1) (people will be more) exposed to UV radiation / (more at risk from skin) cancer (1)	2	**allow** mutation / DNA damage as alternative to cancer
b	argon ☐ carbon dioxide ☑ hydrogen ☐ nitrogen ☐ oxygen ☐ sulfur dioxide ☑	2	**allow** other unambiguous answers, e.g. X in box, underlining, circle if more than 2 answers given, deduct one mark for each additional answer (minimum zero)
	Total	6	

Question	Answer	Marks	Guidance
8	**[Level 3]** Milva is best at 30 cm spacing **or** Blazer would be better at 15 cm spacing **or** idea you can get a greater total yield if you reduce the spacing **AND** explains in terms of competition for specific resources Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Milva is best at 30 cm spacing **or** Blazer would be better at 15 cm spacing **or** idea you can get a greater total yield if you reduce the spacing **or** explains in terms of competition for specific resources Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** correct statement about competition without any reference to specific resources **or** idea that farmers should choose variety with smallest percentage of small size potatoes **or** idea that overall Milva/Blazer is the best taking all distances into account Quality of written communication impedes communication of the science at this level. (1 – 2 marks) **[Level 0]** Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)	6	**This question is targeted at grades up to C.** **Indicative scientific points at level 2 and 3 may include:** • Plants compete for light / water / minerals **ignore** compete just for space **Indicative scientific points at level 1 may include:** • The further apart the plants the less competition **Use the L1, L2, L3 annotations in Scoris. Do not use ticks**.
	Total	**6**	

Question	Answer	Marks	Guidance
9 a		2	all correct = 2 marks 1 or 2 correct = 1 mark (ignoring mako shark – education programmes)
b i	small fish / worms (1)	1	
b ii	a feeding level **or** position/stage/level organism has in a food chain/web (1)	1	**allow** where an organism is in a food chain/web **ignore** what it eats / what eats it
c	**any three from** (yes/no/can not tell – no mark) increase in eagles/breeding pairs (1) BUT continuous/steady increase in eagles/breeding pairs (2) (but) there's no evidence about what the original population size was / what is a viable population size (1) we don't know the effect of removing them from the endangered list (e.g. increased hunting etc) / we don't know what happened after 2006/2007 (1)	3	 **allow** they will be hunted again
	Total	7	

Question	Answer	Marks	Guidance
10 a	**any two from** carries genes / codes / information (1) controls cell activity / characteristics (of organism) (1) controls protein production / synthesis (1) BUT controls production of proteins for growth / repair (2)	2	codes for proteins = 2 **allow** it can replicate / copy itself (1)
b	two strands (1) coiled (1)	2	award marks for clear diagram 'spiral staircase' / 'twisted ladder' = 1 **ignore** references to bases
c i	idea that other scientists/Franklin were involved in the discovery (of the structure of DNA)	1	**ignore** Franklin discovered the structure of DNA **allow** Franklin discovered the helix shape
ii	idea that Watson and Crick worked out the structure / put together other scientists' work (1)	1	
	Total	6	

Question	Answer	Marks	Guidance
11 a i	U shape line = 1 BUT  = 2	2	**allow**  (2) (2)  (1) **ignore** bar charts
ii	37.5 (^{o}C) (1)	1	**allow** answer in range 35-40 (^{o}C) **allow** single number, e.g. 37 (^{o}C) or range, e.g. 37-38 (^{o}C)
b	The volume of carbon dioxide is less than the volume of oxygen / 2nd box (1)	1	more than one answer = 0 **allow** other unambiguous answers, e.g. X in box, underlining, circle
	Total	**4**	

Question	Answer	Marks	Guidance
12 a	**[Level 3]** Describes selecting cows with named characteristic **and** using them for breeding and then repeating this over many generations. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Describes selecting cows with named characteristic **and** using them for breeding. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Describes a suitable characteristic for selection **OR** gives a generic description of selective breeding. Quality of written communication impedes communication of the science at this level. (1 – 2 marks) **[Level 0]** Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)	6	**This question is targeted at grades up to E** **allow** AI/IVF/embryo implants as alternative for breeding **ignore** genetic engineering **Indicative scientific points at level 1 may include:** • breed the 'best' cows • high milk yield • high milk quality • disease resistance • fast growth rate • good meat **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
b i	white (blood) cells (1) *engulfs* pathogens / phagocytosis / makes antibodies (1)	2	**allow** lymphocytes / leucocytes **ignore** fight / destroy pathogens **ignore** engulf infection / engulfs disease **allow** engulf microbes/germs/bacteria
ii	(make sure) it's not harmful / it's free from disease / free from pathogens / AW (1)	1	**allow** to check for side effects **allow** check taste

			allow check to see if antibodies are present / does fight infection **allow** free from bacteria / viruses / microorganisms **ignore** germs **ignore** to make sure it doesn't affect humans
	Total	**9**	

Question	Answer	Marks	Guidance
13 a	different sexes / boy and girl (1)	1	**ignore** any other differences
b	they have the same parents OR they have similar genes OR the genes are not exactly the same (1) BUT they were formed from different eggs and sperm from the same parents OR they have similar genes but not *exactly* the same (2)	2	**ignore** just 'they have different genes' **allow** genes are not identical **ignore** just 'they came from different eggs/sperm'
c	different sperm and eggs join / two sperm join with two eggs (1) at the same time (with the same parents) (1)	2	**allow** two zygotes formed / two separate fertilisations
d	multicellular (1)	1	more than 1 answer = 0 if no answer written on line, look for circling / underlining
	Total	6	

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