OCR
RECOGNISING ACHIEVEMENT

GCSE

Biology B

General Certificate of Secondary Education

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

Mark Scheme for January 2013

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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.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

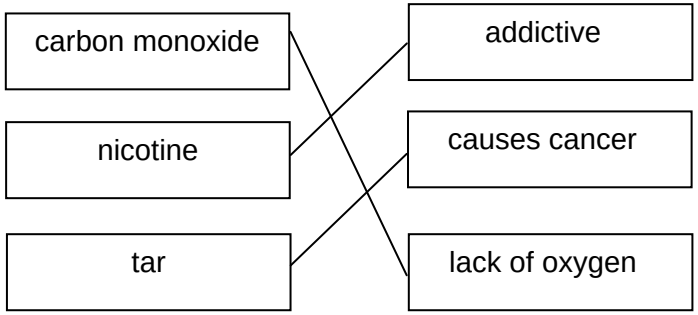
Annotations

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

Subject-specific Marking Instructions

/	=	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

Question			Answer	Marks	Guidance
1	(a)	(i)	root (1)	1	**allow** radicle
		(ii)	(growing) towards gravity / get water / get minerals / for anchorage (1)	1	**allow** because of hormones **allow** grows away from light / towards dark **ignore** simply 'because of dark / because of light' **allow** because of gravity **allow** get nutrients but **ignore** get food **allow** correct higher level answers referring to tropisms / auxin
	(b)		to get light / growing towards light (1) for photosynthesis / make food (1)	2	**allow** sunlight but **ignore** sun **allow** because it's a shoot (1) **allow** because of hormones (1) **allow** correct higher level answers referring to tropisms / auxin eg auxin collects on shaded underside (1) increasing growth (1)
	(c)	(i)	carry genes / DNA / information / codes (1) to control (inherited) characteristics / AW (1)	2	 **allow** to produce new cells / for mitosis **allow** to make proteins (1) **ignore** just growth / reproduction
		(ii)	6 (1)	1	
			Total	**7**	

Question			Answer	Marks	Guidance
2	(a)		no (no mark) idea that physical features not affected by nervous system / are affected by genes / mutation / inheritance / environment / disease / AW (1) idea that no evidence for claim / not repeated (1)	2	if say 'yes' then no marks for explanation if don't say 'no' can still get explanation marks **ignore** simply being frightened won't affect characteristics (in question)
	(b)	(i)	muscle **and** skin (1)	1	**both needed for mark**
		(ii)	sensory (neurone) (1)	1	
	(c)	(i)	trap / catch (1) pathogens / bacteria / viruses / dirt / dust (that enter lungs) (1)	2	eg protect from bacteria / germs / infection =1 **allow** trap germs (2) **allow** clean air (1)
		(ii)		2	all correct (2) **but** one / two correct (1)
			Total	**8**	

Question			Answer	Marks	Guidance
3	(a)		**Level 3 (5–6 marks)** Two or more health risks are correctly linked to their cause. Quality of written communication does not impede communication of the science at this level. **Level 2 (3–4 marks)** Three or four health risks (of being overweight / eating high levels of salt / saturated fat) are listed. Quality of written communication partly impedes communication of the science at this level. **Level 1 (1–2 marks)** One or two health risks (of being overweight / eating high levels of salt / saturated fat) are listed. Quality of written communication impedes communication of the science at this level. **Level 0 (0 marks)** Insufficient or irrelevant science. Answer not worthy of credit.	6	**This question is targeted at grades up to C** **Indicative scientific points at level 3 may include** • high levels of salt is linked to high blood pressure / heart disease • being very overweight (obese)/ eating saturated fat is linked to arthritis / heart disease / diabetes / breast cancer / high blood pressure / high cholesterol • there is a link between the amount of saturated fat eaten and the build up of cholesterol/plaques • cholesterol can restrict or block blood flow in arteries / by forming plaques **One health risk correctly linked to its cause, award L2 max** **Indicative scientific points at level 1 and 2 may include** • arthritis / heart disease / diabetes / breast cancer / high blood pressure / high cholesterol / stroke For L1 and L2 do not need to link health risk to cause **Use the L1, L2, L3 annotations in Scoris. Do not use ticks.**

Question			Answer	Marks	Guidance
	(b)		substitution: (minimum) mass in kg = 24.9×1.8^2 (1) calculation: (minimum) mass in kg = 80.7 (1) calculation: needs lose 120 – 80.7 kg = 39.3 (kg) (1) acceptable final answer to one decimal place (1) each marking point is dependent on the previous marking point	4	mark final answer line first final answer of 39.2 or 39.3 (kg) (with no working) (4) (difference in BMI = $12.1 \times 1.8^2 = 39.2$) **or** final answer of 39 or any number that can be rounded to 39 (3) **or** final answer of 40 or any number that can be rounded to 40 (2) (arrived at by a method of estimation where a mass of 80 gives BMI of 24.7) allow 1 ecf for clearly deducting mass from 120 ie third marking point (plus can still get last marking point if to 1 d.p.)
			Total	**10**	

Question			Answer	Marks	Guidance
4	(a)		to judge distance / binocular vision (1)	1	**allow** stereoscopic vision **ignore** see prey / to catch prey / to focus on prey
	(b)	(i)	pass on a disease / compete with them (1)	1	**allow** eat their food / fight with them / take over their habitat **ignore** hunt / kill them (in question)
		(ii)	protect habitats / captive breeding / legal protection / education programmes (1)	1	**allow** put in zoos / nature reserves **allow** breeding (programme) **allow** provide food **ignore** provide (more) food for foxes **allow** remove other predators **ignore** move out of Tasmania **ignore** simply conservation programme (in question)
			Total	**3**	

Question			Answer	Marks	Guidance
5	(a)	(i)	**any two from:** idea of recycling carbon eg makes the carbon available **again** (for living organisms) / stops the supply of carbon running out / to recycle carbon (1) carbon released as carbon dioxide (1) for photosynthesis (1)	2	**allow** makes the carbon available again for animals **ignore** simply to release carbon / to make carbon available (in question)
		(ii)	bacteria / fungi (1)	1	**allow** saprophyte **ignore** decomposer **ignore** detritivores / examples of detritivores
	(b)		will run out (1) because it takes a long time to form (1)	2	**allow** they are non-renewable **ignore** there is only a limited amount **allow** peat takes (tens of) thousands of years to form **allow** fossil fuels take millions of years to form burned faster than it is made = 2
			Total	**5**	

Question			Answer	Marks	Guidance
6	(a)		a feeding level (1) example such as beech trees and grass are producers / (badgers), mice and deer are primary consumers / ticks are secondary consumers (1)	2	**allow** how high in the food web badgers can be primary or secondary but need justification
	(b)		(mice population would increase) less mice eaten by badgers (1) less competition for food / more food for mice / more beech trees for mice (1)	2	**ignore** idea that **no** mice are eaten **ignore** idea that there are **no** badgers left
	(c)		hooks on the legs (1) hold on (to hairs) (1)	2	**allow** AW for hooks eg claws / spikes / grips **ignore** 'hairs' unless it's clear this refers to the hooks **allow** many legs (1) to hold on (1)

Question			Answer	Marks	Guidance
	(d)	(i)	(idea of no link) qualitative description eg peaks/troughs do not coincide (1) quantitative description eg Lyme disease peaks in 2000 highest temperature is in 1995 (1) **OR** (idea of there is a link) qualitative description eg overall they are both rising (1) quantitative description eg both have lowest values in 1986 (1) **OR** (idea of there is a weak link) two descriptions (qualitative or quantitative) that show contradicting evidence eg both graphs go up (1) but they don't peak at the same time (1)	2	
		(ii)	if it is warmer then more people will go for walks in the country / wear less clothes / ticks breed more (1)	1	**allow** ticks feed more in warm weather **allow** more ticks in warm weather **ignore** ticks more active in warm weather (in question)
			Total	**9**	

Question			Answer	Marks	Guidance
7	(a)		insect (1)	1	**allow** underlining more than 1 answer = 0
	(b)	(i)	parasite (1)	1	**mark the answer line first** **allow** correct answer circled, underlined or ticked more than one answer = 0
		(ii)	**Level 3 (5–6 marks)** Answer includes reference to the genetic basis of the variation of the crickets. The advantage of the variation is covered and the increase in the number of silent crickets is explained by natural selection. Quality of written communication does not impede communication of the science at this level. **Level 2 (3–4 marks)** Answer includes an appreciation of the advantage of the crickets being silent and how this makes them more likely to survive **or** reference to the genetic basis of the variation of crickets. Quality of written communication partly impedes communication of the science at this level. **Level 1 (1–2 marks)** Limited discussion of variation or evolution but no mechanism is used to link the two. Quality of written communication impedes communication of the science at this level. **Level 0 (0 marks)** Insufficient or irrelevant science. Answer not worthy of credit.	6	**This question is targeted at grades up to C** **Indicative scientific points at level 3 may include** • being silent is genetic / controlled by genes • the silent crickets are more likely to survive and pass on their genes **Indicative scientific points at level 2 may include** • being silent makes them better adapted to survive the insects. **ignore** idea that crickets have **learned** to stay silent **Indicative scientific points at level 1 may include** • the existence of silent crickets is variation in the species • some crickets are silent and some are not • silent crickets becoming more common is an example of evolution / natural selection **Use the L1, L2, L3 annotations in Scoris. Do not use ticks.**
			Total	**8**	

Question			Answer	Marks	Guidance
8	(a)		right (1) pressure (1)	2	
	(b)	(i)	carry oxygen (1)	1	**ignore** carries carbon dioxide **not** transports food and oxygen
		(ii)	DNA (1)	1	**allow** deoxyribonucleic acid **ignore** bases
	(c)		(cell) division / mitosis (1) (cell) differentiation / specialisation (1)	2	
			Total	**6**	

Question			Answer	Marks	Guidance
9	(a)		+ oxygen → carbon dioxide + water (1)	1	carbon dioxide + water can be written either way around **allow correct** chemical formulae, ignore balancing
	(b)		**Level 3 (5–6 marks)** RQ for both seeds calculated correctly. Compares calculated results to food type table and links pea seed with carbohydrate **and** peanut with a combination fat+protein. Quality of written communication does not impede communication of the science at this level. **Level 2 (3–4 marks)** RQ for both seeds calculated correctly. Compares calculated results to food type table and links pea seed with carbohydrate **or** peanut with a combination fat+protein. Quality of written communication partly impedes communication of the science at this level. **Level 1 (1–2 marks)** RQ for both seeds calculated correctly **or** one correct RQ with a correct link to food source. Quality of written communication impedes communication of the science at this level. **Level 0 (0 marks)** Insufficient or irrelevant science. Answer not worthy of credit.	6	**This question is targeted at grades up to C.** **Indicative scientific points at level 2 and 3 may include:** consider following point with reference to RQ RQ for carbohydrate = 1.0 so peas must be/use RQ for fat = 0.7 RQ for protein = 0.9 peanuts must be/use combination of protein and fat **Indicative scientific points at level 1 may include:** RQ for pea seed = 1.0 RQ for peanut seed = 0.80 (allow 0.798) **allow** pea is $\frac{0.6}{0.6}$ and peanut is $\frac{13.0}{16.3}$ for 1 mark • for 2 marks need to be clear which RQ is which but both RQs correct in the table will score 2 marks 1 RQ correct only will score 1 mark at L1 **Use the L1, L2, L3 annotations in Scoris. Do not use ticks.**

Question			Answer	Marks	Guidance
	(c)		**any two from:** (chemicals that) speed up the reaction / catalysts (1) proteins (1) by having an active site that the substrate fits into / lock and key idea (1)	2	
			Total	**9**	

Question			Answer	Marks	Guidance
10	(a)	(i)	180 (1)	1	mark answer line first, but if nothing written there look in table
		(ii)	Miracle (1)	1	**allow** ecf from (i)
		(iii)	**any three from:** select Fleet and Miracle (1) BUT cross breed Fleet and Miracle (2) idea of selecting the best offspring (1) idea of repeating the process each generation, each time selecting the best offspring to breed (1)	3	**allow** ecf from (ii) cross breed the variety that is fast growing with the variety that has most kernels = 1
	(b)	(i)	transfer of genes (from one living organism to another) (1)	1	**ignore** improving genes **ignore** genetic modification
		(ii)	have to find the right gene / right section of DNA (1) that has desired code / characteristics (1)	2	
	(c)		**any two from:** may affect things that eat corn / may affect food chains (1) new genes might move into other plants (1) loss of biodiversity (1)	2	 **allow** corn may produce a harmful substance **allow** new plants may need specialised conditions more water / more fertiliser to reach genetic potential (1) **allow** may encourage greater use of herbicides (1)
			Total	**10**	

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