OCR
Oxford Cambridge and RSA

GCSE

Biology B

Unit **B732/01**: Modules B4, B5, B6 (Foundation Tier)

General Certificate of Secondary Education

Mark Scheme for June 2017

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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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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.

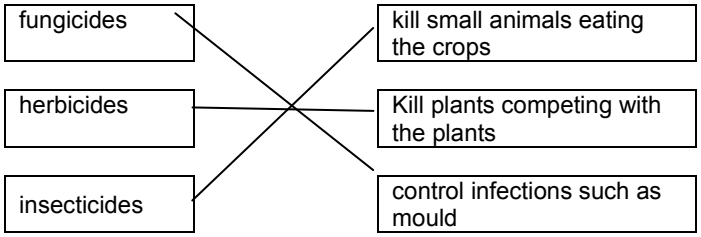
/ = alternative and acceptable answers for the same marking point
(1) = separates marking points
allow = answers that can be accepted
not = answers which are not worthy of credit
reject = answers which are not worthy of credit
ignore = statements which are irrelevant
( ) = words which are not essential 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

Question	Answer	Marks	Guidance
1 a	photosynthesis (1)	1	
b	root (hairs) (1) leaves / stomata (1)	2	 **ignore** pores
c	(oxygen levels) rises during the day as / **more** (Sun) light / **more** photosynthesis (1) (oxygen levels) decreases over night as **no** or **less** /(Sun) light / **no or less** photosynthesis (1)	2	**allow** (oxygen levels) risesearly evening/ **more** (Sun) light / **more** photosynthesis (1) **allow** (oxygen levels) decreases early morning as **no** or **less** /(Sun) light / **no** or **less**photosynthesis (1) **allow** (oxygen levels) decreases as it gets darker (1) **ignore** rate of photosynthesis is highest in early evening **ignore** references to water and carbon dioxide **ignore** references to respiration if both changes are explained but with no direct link to time then = 1 e.g. (oxygen levels) rises **asmore** photosynthesis then decreases as **no** photosynthesis (1)
	Total	**5**	

Question	Answer	Marks	Guidance
2	**[Level 3]** Explain the results in terms of direction of water movement **AND** differences in concentration between the liquid and the cells. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Explain the results in terms of direction of water movement without referring to differences in concentration. **Or** gives a complete explanation for one tube only Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** States that water is moving in or out of the cells withoutreference to the correct direction **OR** links the idea of osmosis to water movement. 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. (0marks)	6	**This question is targeted at grades up to C** **Indicative scientific points at Level 3 may include:** • tube A - cells burst because water moves in (by osmosis) from an area of higher water concentration • tube B - cells shrink because water moves out (by osmosis)because the there is a higher water concentration inside the cells **Indicative scientific points at Level 2 may include:** • tube A - cells burst because water moves in (by osmosis) • tube B- cells shrink because water moves out (by osmosis) **Indicative scientific points at Level 1 may include:** • water moves into the cells • water moves out of the cells • water caused the cell to burst / shrink • osmosis is the movement of water (across a partially-permeable membrane) • when cells burst makes the liquid go clear **If reference to salt solution moving out of red blood cells then answer is limited to level 1** **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
	Total	**6**	

Question	Answer	Marks	Guidance
3 a	net (1)	1	**allow** answer ringed, underlined or ticked more than one answer= 0
b i	all three points correctly plotted (1) (3,36) (4,26) (5,16)	1	
b ii	answer matching line drawn on graph (1)	1	no line = no mark **allow** + or - 1
b iii	numbers are falling (1) (so concerned) there will be none left / become extinct (1)	2	
c	population is the (number) of one species or organism while community is all the species or organisms (1)	1	**allow** population is the (number) of newts while community is all the species or organisms (1) **allow** population is the (number) of one species or organism while community is the number of populations (1) **ignore** community is the number of animals
	Total	**6**	

Question	Answer	Marks	Guidance
4	**any three from:** description of how to change the air movement (1) record how far / fast the bubble moves (1) idea of control of other variables (1) make repeats (1)	3	 e.g. do experiment then repeat with a fan / change the speed pf the fan (1) e.g. use the same plant / keep the temperature or light intensity the same / record for set amount of time (1)
	Total	**3**	

Question	Answer	Marks	Guidance
5 a	**Any two from:** intensive tries to produce as much food as possible (from land /animals /plants) ora(1) organic does not use herbicides ora (1) organic does not use (artificial) fertilisers / ora(1) organic uses natural predators (to kill pests) (1)	2	 **allow** organic uses weeding (1) **allow** organic uses manure and compost (1) **allow** uses biological control (1) **ignore** intensive uses pesticides (in the question) **ignore** just uses insects for protection **allow** organic uses crop rotation (1) varies planting time (1)intensive uses hydroponics (1) glasshouses (1) battery farming (idea of restricted space) (1)
b		1	all correct = 1 mark
c	idea that they agree as provides more food / more crops / higher yield(1) idea that they disagree as pesticides maybe harmful (to humans or the environment) (1)	2	 **ignore** references to taste / harmful to crops
	Total	**5**	

Question	Answer	Marks	Guidance
6 a i	gill (filaments) (1)	1	**ignore** respiratory surface
a ii	idea that the gas exchange is more efficient (1)	1	**allow** gas exchange is faster / it increases it
b	**any two from:** causes inflammation (1) causes scarring (1) idea that gas exchange is less efficient(1)	2	 **ignore** damages the lungs **allow** less gas exchange (1) **allow** reduces surface area for gas exchange (1) **allow** less oxygen taken in (1) **allow** example of a symptom e.g. shortness of breath / hard to breathe / breathlessness / wheezing / fatigue / chest pains / (lung) cancer / lower lung capacity (1) **ignore** the idea that the asbestos blocks the gases **ignore** references to mucus
c i	trauma (1) respiration (1)	2	
c ii	make sure it is safe / make sure it works / check for side effects (1)	1	**allow** limits failures / to check to see if volumes are comparable to human lung / to test for rejection (1)
	Total	**7**	

Question	Answer	Marks	Guidance
7	**[Level 3]** Identifies ways the systems are similar **AND**identifies ways the systems are different **AND** names a type of organism with each system Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** identifies a way the systems are similar **AND**identifies a way the systems are different **OR** identifies a way the systems are similar **OR** different **AND**names a type of organism with each system. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Identifies at least **one** way the systems are similar**OR**Identifies at least **one** way the systems are different **OR** names a type of organism with each system 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. (0marks)	6	**This question is targeted at grades up to E** **Indicative scientific points about differences may include:** • open - blood leaves vessels/ blood flows between cells /closed- blood stays in vessels • open- has only arteries / closed- has (arteries and) veins • open- pores in heart / closed- no pores in heart • open- 'capillaries' / arteries are open at end / closed- arteries / capillaries are joined together or not open at end / no capillaries **Indicative scientific points about similarities may include:** • both carry blood in vessels / arteries • both have a heart • both have valves in heart **Indicative scientific points about types of organisms may include:** • open found in insects / molluscs / arthropods or named insects / molluscs / arthropod • closed found in humans / mammals / or any named vertebrate or vertebrate class **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
	Total	**6**	

Question	Answer	Marks	Guidance
8 a	sprain (1)	1	
b	(yes) idea that total (number of injuries including those reporting no injuries) is 135 (1) adds up to more than 132 (1)	2	if no, then no marks but **allow** 3 **allow**calculation of total injuries 135 which is more than 132 (2) **allow** calculation of total injuries 135 > 132 (2) **allow**total injuries 135 but only 132 were questioned (2) **allow** total number of injuries is 104 which is more than those reporting injuries (101) (2) **allow** any number over 132 if qualified by the statement that this is greater than thenumber of wrestlers (1)
c i	**Any two from :** injury is a compound fracture (1) because the skin surface has been broken (1) bones are radius (1) ulna (1)	3	 **allow** open fracture / simple fracture (1) only **allow** if referring to compound fracture if more than two bones are named wrong answers negate marks
c ii	hinge (1)	1	**ignore** elbow / synovial (1)
	Total	**7**	

Question	Answer	Marks	Guidance
9 a	**Any two from:** less industrial disease / accidents (1) healthier diet (1) healthier life style (1) better medical treatments / healthcare / cures for disease (1) better housing / sanitation / hygiene (1)	2	**allow** better health and safety (1) **allow** better diet / balanced diets(1) **allow** more exercise / less smoking (1) **ignore** less pollution **ignore** better standard of living **ignore** just better technology
b (i)	life expectancy continues to rise (1) life expectancy for males and females will become the same / converge / get closer together (1)	2	**allow** people will live longer (1) **allow** answers that match their lines drawn e.g. life expectancy for females remains higher than males(1) **allow** marks for age quoted for 2030 that matches line drawn e.g. women may live till they are 90 (1) e.g. women may live till they are 90 and males 86 (2) e.g. people will live longer women may live till they are 90 (2)
b (ii)	Idea that line of the graphs may not rise at the same gradient. / other factors could stop the age reaching the predicted level	1	e.g. slope of graph may change / rise more steeply / level off (1) e.g. trend may change (1) **ignore** no evidence / no data e.g. such as **new** diseases / epidemics/ outbreak of disease / increased resistance of bacteria to antibiotic / increased pollution levels / natural disasters (1) **ignore** illnesses can occur / the future is uncertain

	Total	**5**	

Question	Answer	Marks	Guidance
10 a	(DNA) fingerprint (1) idea that everybody has differentDNA/ unique DNA / different fingerprints / unique pattern(1)	2	
b	suspect 2 **AND** idea that the pattern is the same (1)	1	**allow** bands /stripes / lines / fingerprint / sequences match (1) **ignore**idea that the pattern is similar **ignore** just the same DNA as at the crime scene
	Total	**3**	

Question	Answer	Marks	Guidance
11 a	(A) has a flagellum (1) does not have a nucleus (1)	2	**If answer B then no marks** **ignore** tail **allow** has DNA in the cytoplasm / DNA in a loop
b	cholera (1) food poisoning (1)	2	accept any indication of correct answer, if three ringed and two correct then award one mark
	Total	**4**	

Question	Answer	Marks	Guidance
12 a	Thames (1)	1	
b	idea that it will increase monitoring of sewage /pollution idea that sewage / pollution can kill the animals and plants in the water / can spread disease (1)	2	**allow** to stop pollution / reduces pollution **accept** high level answer that sewage may cause eutrophication (1)
	Total	**3**	

Question	Answer	Marks	Guidance
13 a	yeast (1) petrol (1)	2	 **allow** diesel / gasoline (1) **ignore** gas
b i	United States (1)	1	
b ii	11.8 (2) But if incorrect 2200 x 100 18689 (1)	2	 **accept** 12 / 11.7 / 11.77 / 11.77163 (1)
b iii	value for Brazil is higher / ora (1) **any one from:** Brazil may not have supply of oil (1) Brazil grows a lot of sugar (1)	2	**allow**ecf **ignore** have not got any petrol **ignore** grow more crops
c	Mia (1) because there is no evidence (in the question) / no facts supporting her (1)	2	**if incorrect then zero marks for question** **ignore**it is just an opinion
	Total	**9**	

Question	Answer	Marks	Guidance
14	**[Level 3]** Matches all 6organism correctly to each of the three groups of detritivores, carnivores and decomposer in the food web **AND** identifies ways earthworms help improve the structure and fertility of the soil. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Matches **one**organismcorrectly to each of the three groups of detritivores, carnivores and decomposer in the food web **OR** Identifies ways earthworms help improve the structure and fertility of the soil. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Matches **one** organism correctly to each of two of the groups of detritivores, carnivores and decomposer in the food web **OR**Identifies **one** way that earthworms help improve the structure and fertility of the soil 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. (0marks)	6	**This question is targeted at grades up to C** **Indicative scientific points about earthworms may include:** • bury the plant material • aerate the soil • improve drainage • mix up layers • neutralise acid soils **Indicative scientific points about types of organisms may include:** • detritivores, = woodlice / earthworms • carnivores = fox / hedgehog / spider • decomposer = /fungi **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
	Total	**6**	

Question	Answer	Marks	Guidance
15 a i	bat (1)	1	
ii	hippopotamus (1)	1	
iii	(yes – no mark) **any two from** the line does show the trend / the line does show that as body mass increases, brain mass increases (1) the trend does seem to go in a straight line (1) there are the same number of points/four points above and below the line (1)	2	no = award no marks for answer
b i	8 (g) (2) But $\frac{2.5 \times 320}{100}$ (1)	2	correct answer but no working = 2
ii	**any two from** as body mass increases, brain mass increases /ORA (1) as body mass increases, **relative** brain mass decreases / ORA (1)	2	**ignore** high or low must be comparative **ignore** references to 'larger' body mass and brain mass increases as **relative** brain mass decreases = 2

iii	(no) idea that brain mass is higher than expected (1) idea that **relative** brain mass is higher than expected (1)	2	if yes answer then award zero marks **allow** have an abnormally high brain mass (1) **allow** comparison e.g. have a lower body mass than gorilla/elephant but higher brain mass (1) **allow** ratio of brain mass to body mass is higher (1) **allow** ratio of body mass to brain mass is lower (1) **ignore** just 'humans have a high(er)brain mass' **allow** have an abnormally high **relative** brain mass (1) **allow** comparison e.g. have a lower body mass than gorilla/elephant but higher **relative** brain mass (1) **ignore** just 'humans have a high(er) **relative** brain mass' **ignore** just 'they don't fit the pattern'
	Total	**10**	

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