Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/32**

Paper 3 Theory (Core) **May/June 2016**

MARK SCHEME

Maximum Mark: 80

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2016 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

Abbreviations used in the Mark Scheme:

- ; separates marking points
- / alternatives
- **I** ignore
- **R** reject
- **A** accept (for answers correctly cued by the question, or guidance for examiners)
- AW alternative wording (where responses vary more than usual)
- AVP any valid point
- ecf credit a correct statement / calculation that follows a previous wrong response
- **ora** or reverse argument
- ( ) the word / phrase in brackets is not required, but sets the context
- underline actual word given must be used by candidate (grammatical variants excepted)
- max indicates the maximum number of marks that can be given

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Question	Mark scheme	Mark	Guidance
1 (a) (i)	ref. to vertebral column / backbone ; skull ;	[max. 1]	
(ii)	dry skin ; ref. to scales ; eggs with, dry shell / leathery shell ;	[max. 2]	
(iii)	no limbs / legs ;	[1]	
(b) (i)	amphibian ;	[1]	
(ii)	smooth skin / no scales ; gas exchange using skin ; spend part of life (cycle) in water and land/ AW ; ref. to metamorphic life cycle / AW ;	[max. 2]	

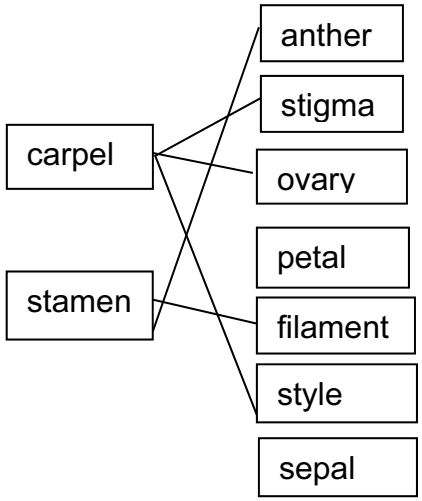
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Question	Mark scheme	Mark	Guidance
(c)	better survival of egg ; fewer eggs need to be produced ; less risk of predation ; maintains suitable temperature ; reduces risk of disease AW ; protected from external environment ;	[max. 2]	
		[Total: 9]	
2 (a)	precipitation ;	[1]	
(b) (i)	transpiration / evaporation ;	[1]	
(ii)	excretion ;	[1]	
(c) (i)	herbivore / primary consumer ;	[1]	**I** consumer unqualified.
(ii)	disease-causing organism ;	[1]	

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Question	Mark scheme	Mark	Guidance
(d)	water recycled AW ; fish waste used as fertiliser ; don't need to buy, water / fertiliser / compost soil ; better land use / can use brown field site / land not suitable for traditional farming ; farmland can be used for other crops ; no heating costs / glasshouse is self-heating / AW ; *idea of* two crops for one lot of resources ;	[max. 3]	
(e) (i)	(resource) produced as rapidly as it is removed; from the environment; so it does not run out;	[max 2]	
(ii)	no fish removed from the wild / AW ; could be used to add fish to wild / AW ; *idea of* no predators ;	[max 1]	
		[Total: 11]	

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Question	Mark scheme	Mark	Guidance
3 (a)	 ;;;;	[4]	4 or 5 lines correct for 4 marks 3 lines correct for 3 marks 2 lines correct for 2 marks 1 lines correct for 1 mark

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Question	Mark scheme	Mark	Guidance
(b)	sperm swim through cervix / uterus ; ref. to sperm moving to / zygote passing through (after fertilisation), oviduct ; to egg (cell) / ovum ; ref. to enzymes in sperm (head) ; ref. to fertilisation / nuclei (of sperm and egg) fuse ; to form a zygote ; jelly coat changes (to prevent entry of more sperm) ; ref. to cell division / mitosis ; ref. to embryo is a ball of cells ; (embryo) implants into uterus wall ;	[max 4]	
(c)	(takes place as) part of sexual reproduction ; (products) genetically different ; formation of, gametes / sex cells / eggs and sperm ; four (daughter) cells produced ; AVP ;	[max 2]	**A** results in half the number of chromosomes / formation of haploid nuclei **A** has two divisions
		[Total: 10]	

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Question	Mark scheme	Mark	Guidance
4 (a) (i)	A cell wall ; B nucleus ; C vacuole ;	[3]	
(ii)	glucose / simple sugars ;	[1]	
(iii)	absorbs water ; absorbs mineral, salts / ions ;	[2]	
(iv)	provides large surface (area) ;	[1]	
(b)	1. (name) chloroplast(s) ; 2. contain chlorophyll ; 3. ref. to photosynthesis ; 4. absorb / traps / uses, energy / light ; 5. to produce glucose for the plant / AW ;	[max 3]	
		[Total: 10]	
5 (a) (i)	25–34	[1]	
(ii)	increases (with age) ; plateaus between 45–64 ; then falls (at / after 65) ;	[max 2]	

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Question	Mark scheme	Mark	Guidance
(iii)	higher risk for men ; men twice as high as women / 40% for men and 20% for women / difference is 20% ;	[2]	
(b)	diet qualified ; stress ; smoking / tobacco ; genetic predisposition ; AVP ;	[max 3]	**R** age / gender qualification must be a factor that leads to CHD **A** obesity
(c)	**F** ;	[1]	
(d) (i)	listening to (heart sounds) ;	[1]	
(ii)	prevents blood flowing backwards / AW ;	[1]	
(iii)	8 (times) ;	[1]	
(iv)	$8 \times 6 =$ 48 ;;	[2]	
(v)	*idea of* heart beats / pulse rate faster, more frequent / more peaks / peaks closer together;	[1]	
		[Total: 15]	

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<table>
<tr><th>Question</th><th>Mark scheme</th><th>Mark</th><th>Guidance</th></tr>
<tr><td>6 (a)</td><td>Change the genetic material (of an organism) ;

By removing / changing / inserting (individual) genes ;

From one organism / species to another ;</td><td>[max 2]</td><td></td></tr>
<tr><td>(b) (i)</td><td>rapid reproduction ;

can make complex molecules ;

cheaper to produce ;

ref. to no ethical issues ;</td><td>[max 2]</td><td></td></tr>
<tr><td>(ii)</td><td>
<table>
<tr><th>statement</th><th>uses genetic engineering?</th></tr>
<tr><td>producing fruit juice using pectinase</td><td></td></tr>
<tr><td>introducing genes into crop plants to provide additional vitamins</td><td>✓ ;</td></tr>
<tr><td>selective breeding to produce organisms with desirable features</td><td></td></tr>
<tr><td>placing a section of DNA into bacteria to produce human insulin</td><td>✓ ;</td></tr>
<tr><td>using yeast to produce ethanol</td><td></td></tr>
<tr><td>the use of contraceptive implants in birth control</td><td></td></tr>
</table>
</td><td>[2]</td><td>3 ticks–deduct 1 mark
4, 5 or 6 ticks = 0 marks</td></tr>
</table>

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Question	Mark scheme	Mark	Guidance
(c) (i)	to kill weeds; to reduce competition, with weeds / for resources; to increase crop yield;	[max 2]	
(ii)	(the weeds) kills them AW ; (the crop plants)no effect / does not kill them ;	[2]	
		[Total: 10]	
7 (a) (i)	deforestation;	[1]	
(ii)	habitat destruction / AW ; disruption of food chain ; soil erosion / loss of soil / AW ; flooding ; increase in CO_2 in the atmosphere / less CO_2 absorbed / photosynthesis, by trees / ref. to global warming ;	[max 3]	**I** refs to extinction **A** idea of landslides **R** refs. to ozone
(b) (i)	84% ;;;	[3]	correct working $\frac{315\,000 - 50\,000}{315\,000} \times 100$ or $\frac{265\,000}{315\,000} \times 100$

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Question	Mark scheme	Mark	Guidance
(ii)	monitoring species; protection of species; monitoring habitat; protection / replenishment, of habitat; ref. to food source; keeping in, zoos / reserves; captive breeding programme; education programme; ecotourism;	[max 2]	**A** no poaching / no pet trade / by legislation
(c)	loss of biodiversity; less resistance to diseases / pests;	[max 1]	
		[Total: 10]	

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Question	Mark scheme	Mark	Guidance
8	stimulus; receptor; relay / relay neurone; effector; response;	[5]	
		[Total: 5]	

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