Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/32**

Paper 3 Theory (Core) **October/November 2016**

MARK SCHEME

Maximum Mark: 80

Published

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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
- 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 words given must be used by the candidate (or grammatical variants of them)

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Question	Answer	Mark	Guidance
1(a)(i)	arachnida / arachnids;	**1**	
1(a)(ii)	8 legs / 4 pairs of legs; 2 part body / cephalothorax and abdomen; no antennae; simple / multiple, eyes;	**2**	
1(b)	crustaceans; myriapods; insects;	**2**	
		Total: 5	

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Question	Answer	Mark	Guidance
2(a)	air / droplet; (pathogens) inhaled/breathed in (to lungs); indirect contact / food / liquids / contaminated surfaces or object or water; eat / ingest or drinking / touch surfaces / touch objects / via clothing / linen; broken skin; bites / cuts / grazes / needle stick; blood / (named) body fluids; blood transfusions / sexual contacts / sharing needles; direct / physical, contact; skin to skin / touching someone; AVP with explanation;	**4**	

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Question	Answer	Mark	Guidance
2(b)(i)	skin; *idea of* beneficial bacteria (on skin / in gut / in vagina); nose hair; mucus; stomach acid / HC*l* / gastric juices; ear wax; tears / saliva; vaginal secretions / AW; scabs seal wounds / blood clots; AVP;	**2**	

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Question	Answer	Mark	Guidance
2(b)(ii)	keep food covered; kitchen free from animals (pets / rodents / insects etc) / equipment for killing pests / empty waste bins frequently; keep cooked and uncooked food separate; *idea of* correct storage temperature for food; thawed food not re-frozen; cook food, thoroughly / at correct temperature; wash / clean, food; wash / clean / sterilise, hands; wash / clean / sterilise, equipment; wash / clean / sterilise / use anti-bacterial sprays, on preparation surface; no smoking in the kitchen; different, preparation surfaces / chopping boards, for different food groups; dry surfaces; use within (use by) dates; keep wounds under waterproof dressings; use gloves / hair nets; AVP;	**2**	

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Question	Answer	Mark	Guidance
2(b)(iii)	vaccination / immunisation / inoculation / antiseptics / disinfectants / sterilising / boiling water; water treatment / sewage treatment / chlorination of drinking water managed land-fill sites; insecticide sprays / mosquito nets / rat poison; condoms; AVP;	**1**	
		Total: 9	

Question	Answer	Mark	Guidance
3	B; H; C; G; B / D; F; H;	**7**	
		Total: 7	

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Question	Answer	Mark	Guidance
4(a)(i)	produced / replaced, as rapidly as it is removed; from the environment; so it does not run out;	**2**	
4(a)(ii)	*sustainable resource:* forests / wood / timber / fish stocks / biofuels; *non-sustainable resource:* fossil fuels / e.g. of fossil fuel / mineral reserves / ores AVP;	**2**	
4(b)	1 screening / filtering or removal of, solids / large objects; 2 settling or heavy objects / grit, sink to bottom; 3 microbes / bacteria, decompose organic matter in aerobic conditions; 4 aeration; 5 organic material removed by anaerobic micro-organisms; 6 chlorine added / UV light / ozone / sterilisation / use of disinfectants / bactericides; 7 distillation;	**3**	
		Total: 7	

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Question	Answer	Mark	Guidance
5(a)	*J* – larynx; *K* – trachea; *L* – bronchus; *M* – lung;	**4**	
5(b)	**P**; *idea of:* large(r) surface area (than N) / alveolar wall is thin(ner) / small diffusion distance / blood vessel closer to alveolar wall (than R or N) / more rapid diffusion of gases / thin(ner) or smaller cells than Q;	**1** **1**	
5(c)(i)	oxygen ***and*** glucose (on LHS); water ***and*** carbon dioxide (on RHS);	**2**	

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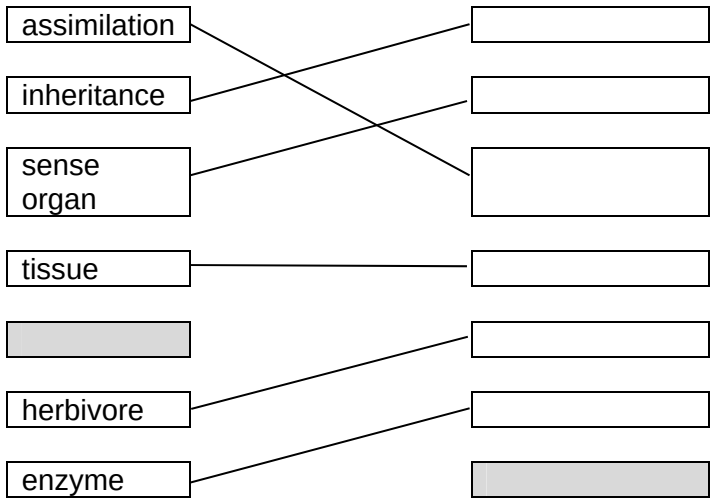
Question	Answer	Mark	Guidance
5(c)(ii)	*energy needed for:* 1 contraction of muscle fibres / body movement; 2 (examples of) chemicals reactions; 3 cell division / growth / repair; 4 passage of nerve impulses; 5 brain activity; 6 maintenance of constant body temperature; 7 reproduction / embryo development; 8 digestion; 9 excretion; 10 AVP;	**3**	
		Total: 11	

Question	Answer	Mark	Guidance
6(a)	movement of water; by diffusion / down a concentration gradient; through a partially permeable membrane;	**3**	
6(b)(i)	*A:* cell wall; *B:* cytoplasm; *C:* nucleus;	**3**	
6(b)(ii)	label line to end, on / in, central vacuole;	**1**	

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Question	Answer	Mark	Guidance
6(c)	absorbs water / water moves or diffuses into cell / enters the cell; (cell) gets bigger; vacuole gets bigger; cell wall pushed out / AW; (cell) becomes turgid / turgor pressure increases; AVP;	**3**	
		Total: 10	

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Question	Answer	Mark	Guidance
7		5	
		Total: 5	

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Question	Answer	Mark	Guidance
8(a)	urine / excretion; breathing / exhaling; faeces / egestion;	**2**	
8(b)	sweat comes from sweat glands; (sweat / water) on skin surface; water evaporates; using heat energy from the body; ref. to blood carries heat; loss of heat energy lowers body temperature; AVP; e.g. ref. to latent heat e.g. ref. to energy levels in water molecules	**4**	
8(c)(i)	9 (arbitrary units per hour);	**1**	

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Question	Answer	Mark	Guidance
8(c)(ii)	(more) weight carried, the more sweat produced / ora; when there is no load, sweat is still produced OR little difference in sweating between no load and 3 kg load; the relationship is not linear / a greater volume of sweat is produced when the increase is from 6 to 9 kg than when the increase is from 3 to 6 kg / AW; data quote comparison of figures;	**2**	
8(d)(i)	92(%);;	**2**	$\frac{24.0-12.5}{12.5}\times 100$ **or** $\frac{11.5}{12.5}\times 100$
8(d)(ii)	the track suit adds mass; track suit material, is an insulator / traps heat; more heat retained in body / temperature raised / body is hotter / AW;	**2**	
		Total: 13	

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Question	Answer	Mark	Guidance
9	chlorophyll; glucose / starch; palisade; stomata; epidermis; chlorophyll;	**6**	
		Total: 6	

Question	Answer	Mark	Guidance
10(a)	root hair (cell);	**1**	**R** root
10(b)	line ending on xylem tissue in root; line ending on xylem tissue in stem;	**2**	
10(c)(i)	stomata in / transpiration from, lower surface of leaf; jelly blocks the stomata in **M** / no stomata blocked in **L**; stomata are needed for, transpiration / water loss;	**2**	
10(c)(ii)	little transpiration from / few stomata on, the upper surface; more, transpiration / water loss, from the lower surface of leaf; (so) jelly has little effect / AW;	**2**	
		Total: 7	

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