Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/31**

Paper 3 Theory (Core) **October/November 2017**

MARK SCHEME

Maximum Mark: 80

Published

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Mark schemes will use these abbreviations

- **;** 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	Answer	Marks	Guidance
1		**4**	1 correct = 1 mark 2 correct = 2 marks 3 correct = 3 marks 4 or 5 correct = 4 marks

	key	name of insect	letter
1 (a)	body is long and thin	go to 2	
(b)	body is short and rounded	go to 3	
2 (a)	body has a spotted pattern	*A. oculatus*	**D**
(b)	body has a plain pattern	*P. pyralis*	**E**
3 (a)	no visible antennae	*C. lunaris*	**C**
(b)	visible antennae	go to 4	
4 (a)	body has a striped pattern	*G. lineatum*	**A**
(b)	body has a dotted pattern	*C. septempunctata*	**B**

;;;;

Question	Answer	Marks	Guidance
2(a)	a group of organisms of one <u>species</u> **;** living in the same area, at the same time **;**	**2**	
2(b)(i)	phytoplankton / algae **;**	**1**	
2(b)(ii)	limpets / zooplankton / mussels / fish **;**	**1**	
2(b)(iii)	phytoplankton → zooplankton → fish → seagull **;**	**1**	

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Question	Answer	Marks	Guidance
2(b)(iv)	*starfish* 1. (population) increases **;** 2. lack of predators / fewer sharks, to eat starfish **;** *limpets* 3. (population) decreases **;** 4. increased predation / more starfish or more octopus to eat them **;**	**4**	
2(b)(v)	(more) hunting **;** (named) pollution / contamination **;** starvation / decreased food supply / competition for (food) **;** disease **;** more predators **;** habitat destruction **;** introduced / alien species **;**	**2**	**A**. over-harvesting / fishing (for sharks) **A.** death of starfish / octopus
2(c)	(the) Sun **;**	**1**	
2(d)	(**A**) condensation **;** (**B**) evaporation **;** (**C**) transpiration / evaporation / evapotranspiration **;** (**D**)precipitation **;**	**4**	

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>3(a)</td><td>
<table>
<tr><th>natural</th><th>chemical</th><th>barrier</th><th>surgical</th></tr>
<tr><td>abstinence

monitoring body temperature</td><td>contraceptive pill

IUD</td><td>condom

diaphragm</td><td>female sterilisation

vasectomy</td></tr>
</table>
;;;;</td><td>4</td><td>8 correct = 4 marks
7 or 6 correct = 3
5 or 4 correct = 2
2 correct = 1
1 correct = 0

A IUD in barrier column</td></tr>
<tr><td>3(b)</td><td>hormones ;

ovary ;

egg cells ;</td><td>3</td><td></td></tr>
<tr><td>3(c)(i)</td><td>human immunodeficiency virus ;</td><td>1</td><td></td></tr>
<tr><td>3(c)(ii)</td><td>transmission
breast, milk / feeding ;

mother to unborn child / through placenta / birth ;

blood / blood transfusion / organ transplants ;

injecting drugs / contaminated or sharing needles / contaminated or sharing syringes ;

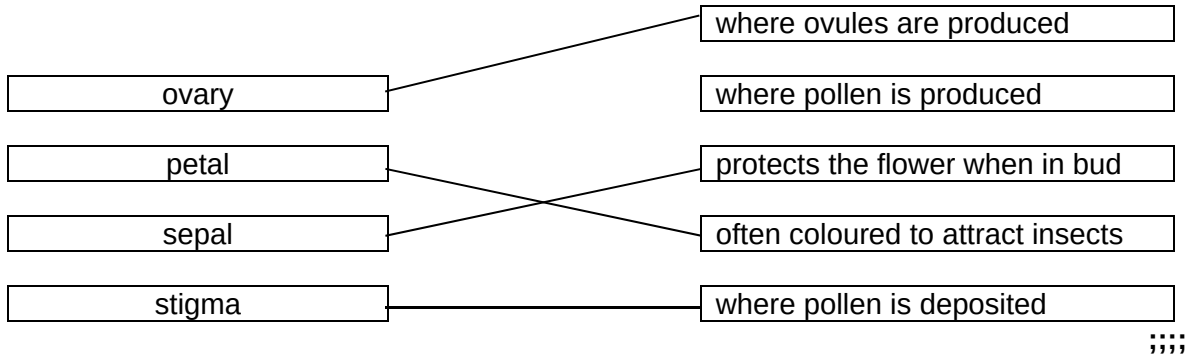
idea of via, vaginal / seminal / sexual, fluids
OR sexual intercourse / sex, without a condom (protection) ;</td><td>2</td><td></td></tr>
</table>

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Question	Answer	Marks	Guidance
3(c)(iii)	*control* ref. to education **;** needle exchange / not sharing needles / use sterile needles / AW **;** free / use, condoms / femidoms **;** free testing (for individuals) **;** screening of, blood / blood products / AW **;** antiretroviral / ARV, drugs **;** *idea of* avoiding blood to blood contact **;**	**2**	 **A** barrier methods / protection, during sex(ual intercourse)

Question	Answer	Marks	Guidance
4(a)	**A ;** **C ;** **D ;** **F ;**	**4**	
4(b)	fewer / less **;** sticky **;** heavier / denser **;** spiky **;** larger **;**	**2**	**I** scent
4(c)	meiosis **;**	**1**	

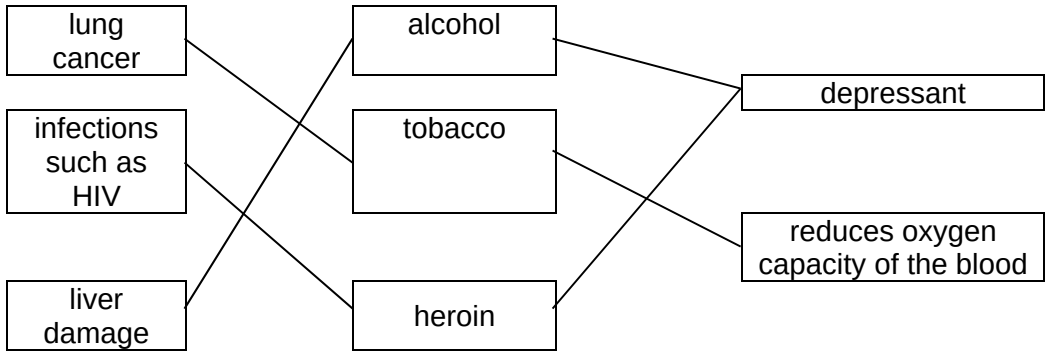
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Question	Answer	Marks	Guidance
4(d)	 **;;;;**	**4**	

Question	Answer	Marks	Guidance
5(a)(i)	palisade (mesophyll) **;** guard (cell) **;**	**2**	
5(a)(ii)	chloroplast **;**	**1**	
5(b)	cell membrane circled **;** cytoplasm circled **;** nucleus circled **;**	**3**	minus 1 mark for each additional circled structure
5(c)	carbon dioxide and water **;**	**1**	

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Question	Answer	Marks	Guidance
5(d)	*leaf* ***A*** bigger / larger, surface (area) OR bigger / thicker / more, mesophyll (layer / cells) **;** absorbs more light / more chlorophyll / more chloroplasts / more gas exchange / more stomata **;**	**2**	

Question	Answer	Marks	Guidance
6(a)	 **;;;**	**3**	1 mark for each correctly linked drug
6(b)(i)	66–70 **;**	**1**	
6(b)(ii)	10(%) **;**	**1**	

Question	Answer	Marks	Guidance
6(b)(iii)	increases and decreases / after 20 years old it decreases **;** peaks in the 16–20 year old age group / AW **;** any correct reference to description of fluctuation at 51–65 year olds **;** data quote with units **;**	**3**	
6(c)	bacterial **;**	**1**	

Question	Answer	Marks	Guidance
7(a)(i)	warm, dry air **;**	**1**	
7(a)(ii)	0.4 (mm per min) **;;**	**2**	If no correct answer 4÷10 for 1 mark
7(a)(iii)	(air bubble) moves, further / faster **;**	**1**	
7(b)	root (hair cell) **;** by osmosis **;**	**2**	

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Question	Answer	Marks	Guidance
7(c)	(water) evaporates **;** from (surface of mesophyll) cells **;** water vapour diffuses **;** through stomata **;**	**3**	
7(d)	xylem **;**	**1**	

Question	Answer	Marks	Guidance
8(a)	carbohydrates **;** fats / lipids **;** protein **;** vitamins / named vitamin **;** minerals / name mineral **;** fibre **;**	**3**	
8(b)	small intestine **;**	**1**	
8(c)	(**A**) ureter **;** (**B**) bladder **;** (**C**) urethra **;**	**3**	

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>8(d)</td><td>
<table>
<tr><td>changes in the body</td><td colspan="2">urine volume</td><td colspan="2">urine concentration</td></tr>
<tr><td></td><td>increases</td><td>decreases</td><td>increases</td><td>decrease</td></tr>
<tr><td>increase in body temperature</td><td></td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>increase in exercise</td><td></td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>increase in water uptake</td><td>✓</td><td></td><td></td><td>✓</td></tr>
</table>
;;
</td><td>2</td><td>1 mark for each correct row</td></tr>
</table>