



---

**BIOLOGY**

**0610/33**

Paper 3 Theory (Core)

**October/November 2017**

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 International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2017 series for most Cambridge IGCSE<sup>®</sup>, Cambridge International A and AS Level components and some Cambridge O Level components.

© IGCSE is a registered trademark.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

---

This document consists of **11** printed pages.

**Mark schemes will use these abbreviations**

- ; separates marking points
- / alternatives
- **I** **I**
- **R** reject
- **A** **A** (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

Question	Answer	Marks	Guidance												
1(a)	<i>any 2 from</i> feathers / beak / wings / hard-shelled eggs / two legs ;;	<b>2</b>													
1(b)	<table border="1"> <thead> <tr> <th>name of bird</th> <th>letter</th> </tr> </thead> <tbody> <tr> <td>pied avocet</td> <td><b>A</b></td> </tr> <tr> <td>Andean avocet</td> <td><b>B</b></td> </tr> <tr> <td>common sandpiper</td> <td><b>C</b></td> </tr> <tr> <td>banded stilt</td> <td><b>E</b></td> </tr> <tr> <td>whimbrel</td> <td><b>D</b></td> </tr> </tbody> </table> <p>**** ; ; ; ;</p>	name of bird	letter	pied avocet	<b>A</b>	Andean avocet	<b>B</b>	common sandpiper	<b>C</b>	banded stilt	<b>E</b>	whimbrel	<b>D</b>	<b>4</b>	4 or 5 correct = 4 marks 3 correct = 3 marks 2 correct = 2 marks 1 correct = 1 mark
name of bird	letter														
pied avocet	<b>A</b>														
Andean avocet	<b>B</b>														
common sandpiper	<b>C</b>														
banded stilt	<b>E</b>														
whimbrel	<b>D</b>														
1(c)(i)	idea of long legs allow them to wade in shallow water ;  idea of long beaks to, dig up / catch their prey ;  AVP ;	<b>2</b>													
1(c)(ii)	natural selection ;	<b>1</b>	<b>A</b> adaptation / evolution / survival of the fittest												

Question	Answer	Marks	Guidance																																																								
2(a)(i)	H ;	1																																																									
2(a)(ii)	bladder ;	1																																																									
2(b)	(ureter) carries, urine/urea, from the kidneys /to the bladder ; (urethra) carries, urine/urea, from the bladder to the outside ;	2	A transports urine for 1 mark only																																																								
2(c)(i)	amino acids ;	1	R if more than one answer																																																								
2(c)(ii)	liver ;	1																																																									
2(d)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">rest day</th> <th colspan="4">race day</th> </tr> <tr> <th colspan="2">water input from /cm<sup>3</sup></th> <th colspan="2">water loss from /cm<sup>3</sup></th> <th colspan="2">water input from /cm<sup>3</sup></th> <th colspan="2">water loss from /cm<sup>3</sup></th> </tr> </thead> <tbody> <tr> <td>respiration</td> <td>400</td> <td>faeces</td> <td>100</td> <td>respiration</td> <td>500</td> <td>faeces</td> <td>100</td> </tr> <tr> <td>food</td> <td>500</td> <td>skin</td> <td>400</td> <td>food</td> <td>500</td> <td>skin</td> <td><b>1900</b></td> </tr> <tr> <td>drink</td> <td>1500</td> <td>breathing</td> <td>400</td> <td>drink</td> <td><b>2000</b></td> <td>breathing</td> <td>600</td> </tr> <tr> <td></td> <td></td> <td>urine</td> <td><b>1500</b></td> <td></td> <td></td> <td>urine</td> <td>400</td> </tr> <tr> <td>Total</td> <td><b>2400</b></td> <td>Total</td> <td>2400</td> <td>Total</td> <td>3000</td> <td>Total</td> <td>3000</td> </tr> </tbody> </table> ;	rest day				race day				water input from /cm <sup>3</sup>		water loss from /cm <sup>3</sup>		water input from /cm <sup>3</sup>		water loss from /cm <sup>3</sup>		respiration	400	faeces	100	respiration	500	faeces	100	food	500	skin	400	food	500	skin	<b>1900</b>	drink	1500	breathing	400	drink	<b>2000</b>	breathing	600			urine	<b>1500</b>			urine	400	Total	<b>2400</b>	Total	2400	Total	3000	Total	3000	2	4 correct = 2 2 or 3 correct = 1 1 correct = 0
rest day				race day																																																							
water input from /cm <sup>3</sup>		water loss from /cm <sup>3</sup>		water input from /cm <sup>3</sup>		water loss from /cm <sup>3</sup>																																																					
respiration	400	faeces	100	respiration	500	faeces	100																																																				
food	500	skin	400	food	500	skin	<b>1900</b>																																																				
drink	1500	breathing	400	drink	<b>2000</b>	breathing	600																																																				
		urine	<b>1500</b>			urine	400																																																				
Total	<b>2400</b>	Total	2400	Total	3000	Total	3000																																																				
2(e)	increased volume (of urine) ;  (urine is) more dilute/less concentrated ;	2																																																									

Question	Answer						Marks	Guidance
3(a)	action	chronic obstructive pulmonary disease	coronary heart disease	HIV infection	liver disease	lung cancer	3	
drinking alcohol		(✓)		✓		;		
injecting heroin		(✓)	✓	(✓)		;		
smoking tobacco	✓	✓			✓	;		
3(b)	contains nicotine ; addictive / withdrawal symptoms / AW ;						2	
3(c)(i)	woman's blood alcohol reaches a higher peak ; woman's blood alcohol reaches its peak later / slower ; woman's blood alcohol takes longer to return to the original level / AW ; after 12 minutes the woman's blood alcohol is higher than the man's ;						2	
3(c)(ii)	70 ;						1	
3(c)(iii)	20 ;						1	ecf from 3(c)(ii)
3(c)(iv)	differences in size / ref. to enzyme activity / metabolism / genetic predisposition / age / more active liver / AVP ;						1	A different food intake / tolerance to alcohol

Question	Answer	Marks	Guidance
4(a)	<b>G</b> as first letter ; <b>E D F</b> in the middle ; <b>A</b> as the last letter ;	<b>3</b>	<b>A EFD</b>
4(b)	barrier ; surgical ; chemical ;	<b>3</b>	
4(c)(i)	(infection transmitted) via exchange of (named )body fluids ; during sexual contact ;	<b>2</b>	
4(c)(ii)	AIDS ;	<b>1</b>	
4(c)(iii)	(contaminated) blood transfusions / organ transplants / sharing needles / breast feeding / birth / blood to blood contact / AVP ;	<b>1</b>	<b>R</b> saliva

Question	Answer	Marks	Guidance
5(a)(i)	pollen (grains) ;	1	
5(a)(ii)	ovules ;	1	
5(a)(iii)	anthers ;	1	
5(a)(iv)	stigma ;	1	
5(b)	<p><i>insect - pollinated</i> petal shape / landing platform / mimicry AW ; colour ; nectar / nectaries ; guideline ; sticky / spikey / large, pollen ; anthers / stamens enclosed ;</p> <p><i>wind - pollinated</i> small / no petals ; exposed anther / stigma ; feathery stigma ; loosely attached anthers ; large quantity of pollen ; smooth / light, pollen ;</p>	4	<p>max 3 from either section.</p> <p>! scent / smell ! any ref to seeds</p>
5(c)	(suitable) temperature ; oxygen ; water ;	2	

Question	Answer	Marks	Guidance
6(a)	(they are) producers ; makes its own food ; ref to photosynthesis ; animals / consumers cannot make their own food / get food from plants ;	3	
6(b)(i)	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 2px 5px; margin: 0 5px;">desert plants</div> <span style="margin: 0 5px;">→</span> <div style="border: 1px solid black; padding: 2px 5px; margin: 0 5px;">kangaroo rat / lizard</div> <span style="margin: 0 5px;">→</span> <div style="border: 1px solid black; padding: 2px 5px; margin: 0 5px;">snake</div> <span style="margin: 0 5px;">→</span> <div style="border: 1px solid black; padding: 2px 5px; margin: 0 5px;">hawk</div> </div> ;	1	R if more or less than 4 organisms given
6(b)(ii)	hawk ; snake ; fox ;	2	
6(c)	<i>scorpions</i> population decrease ; less food ; <i>desert plants</i> population increases ; idea of less predation / less herbivores / primary consumers to eat them / AW ;	4	



Question	Answer	Marks	Guidance
7(a)(i)	chlorophyll ;	1	
7(a)(ii)	palisade (mesophyll) ;	1	<b>A</b> guard cell / spongy mesophyll cell
7(b)(i)	cuticle ;	1	
7(b)(ii)	(upper) epidermis ;	1	
7(c)	<i>xylem</i> water / mineral ions ;  <i>phloem</i> sugars ;	2	<b>A</b> other correctly named molecules e.g. sucrose / amino acids
7(d)(i)	stomata ;	1	
7(d)(ii)	carbon dioxide ;	1	<b>A</b> water <u>vapour</u>
7(d)(iii)	oxygen ;	1	

<b>Question</b>	<b>Answer</b>	<b>Marks</b>	<b>Guidance</b>
8(a)(i)	hormones ;	<b>1</b>	
8(a)(ii)	pancreas ;	<b>1</b>	
8(a)(iii)	reduce blood, sugar / glucose, concentration ;	<b>1</b>	
8(b)	blood / plasma ;	<b>1</b>	
8(c)(i)	changing the genetic material (of an organism) ; by, removing / changing / inserting individual genes ;	<b>2</b>	
8(c)(ii)	herbicide resistance / pest resistance / production of vitamins / drought resistance / frost resistance / AVP ;	<b>1</b>	

<b>Question</b>	<b>Answer</b>	<b>Marks</b>	<b>Guidance</b>
9(a)(i)	(male) black (fur) (female) white (fur) ;	<b>1</b>	
9(a)(ii)	<b>bb</b> ;	<b>1</b>	
9(a)(iii)	<b>Bb</b> ;	<b>1</b>	
9(b)(i)	<b>BB</b> and <b>Bb</b> ;	<b>1</b>	
9(b)(ii)	3 (black) : 1 (white) ;	<b>1</b>	