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Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2015 series

0610 BIOLOGY

0610/23 Paper 2 (Core Theory), maximum raw mark 80

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.

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Abbreviations used in the Mark Scheme

- **;** separates marking points
- **/** separates alternatives within a marking point
- **R** reject
- **ignore** mark as if this material was not present
- **A** accept (a less than ideal answer which should be marked correct)
- AW alternative wording (accept other ways of expressing the same idea)
- underline words underlined (or grammatical variants of them) must be present
- max indicates the maximum number of marks that can be awarded
- mark independently the second mark may be given even if the first mark is wrong
- ecf credit a correct statement that follows a previous wrong response
- ( ) the word / phrase in brackets is not required, but sets the context
- **ora** or reverse argument
- AVP any valid point

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Question	Answer	Marks	Additional Guidance
1	**C** *(Castor canadensis)* **B** *(Lutra lutra)* **D** *(Panthera tigris)* **A** *(Panthera leo)* **E** *(Canis lupus)*	[4]	1 correct = 1 mark 2 correct = 2 marks 3 correct = 3 marks 4 or 5 correct = 4 marks
		[Total 4]	
2 (a)	evaporation of water ; from (surface of) mesophyll cells ; (followed by) loss of water vapour ; diffusion of water ; through stomata ; of (plant) leaves ;	max [3]	
(b)	**G** ; *any two from:* has largest surface area; (so it has the) greatest number of stomata; more water vapour will escape;	max [3]	**A J** with *two* of the following reasons mesophyll cells directly exposed to air ; water vapour escapes without passing through stomata ; so more water vapour will escape ;
(c) (i)	plant lost mass ; (plant lost more mass) during 12 hours in light than during 12 hours in dark / in dark and light for same amount of time ; data (to support) ;	max [2]	
(ii)	(bag) impermeable to water ; prevents loss of water from soil ; water only lost from leaves ; so mass lost is only due to transpiration ;	max [2]	

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Additional Guidance</th></tr>
<tr><td>(iii)</td><td>temperature ;
humidity ;
wind speed ;</td><td>[2]</td><td></td></tr>
<tr><td></td><td></td><td>[Total 12]</td><td></td></tr>
<tr><td>3 (a) (i)</td><td>X ovary ;
Y umbilical cord ;
Z uterus ;</td><td>[3]</td><td></td></tr>
<tr><td>(ii)</td><td>line labelled F ending in oviduct;</td><td>[1]</td><td></td></tr>
<tr><td>(iii)</td><td><table><tr><th>mother to fetus</th><th>fetus to mother</th></tr><tr><td>oxygen ;
glucose ;
amino acids ;
water ;
vitamins / named example ;
minerals / named example ;</td><td>carbon dioxide ;
urea ;</td></tr></table></td><td>max [4]</td><td>two from each column

for mother to fetus
A alcohol / drugs / antibodies / carbon monoxide</td></tr>
</table>

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Question	Answer	Marks	Additional Guidance
(b)	amnion / sac has burst or no amniotic fluid / liquid round baby ; so baby can pass out / vagina is lubricated / vagina is washed with sterile liquid ; cervix has dilated / vagina has widened ; so baby can pass out ; head of baby has rotated; to enable baby to pass out more easily; head of baby has moved further down (birth canal); head born first – baby can breathe air as soon as head is out / easier to deliver rest of body; uterus muscle contracts; to push baby out of body; AVP plus reason;	max [4]	one mark for each correct box change must relate to reason given in that row
(c)	*growth:* permanent ; increase in size / AW ; increase in cell size ; increase in cell number ; *development:* increase in complexity; example (possibly from diagrams given);	max [4]	max 3 from one section
(d) (i)	4 (months) ;	[1]	

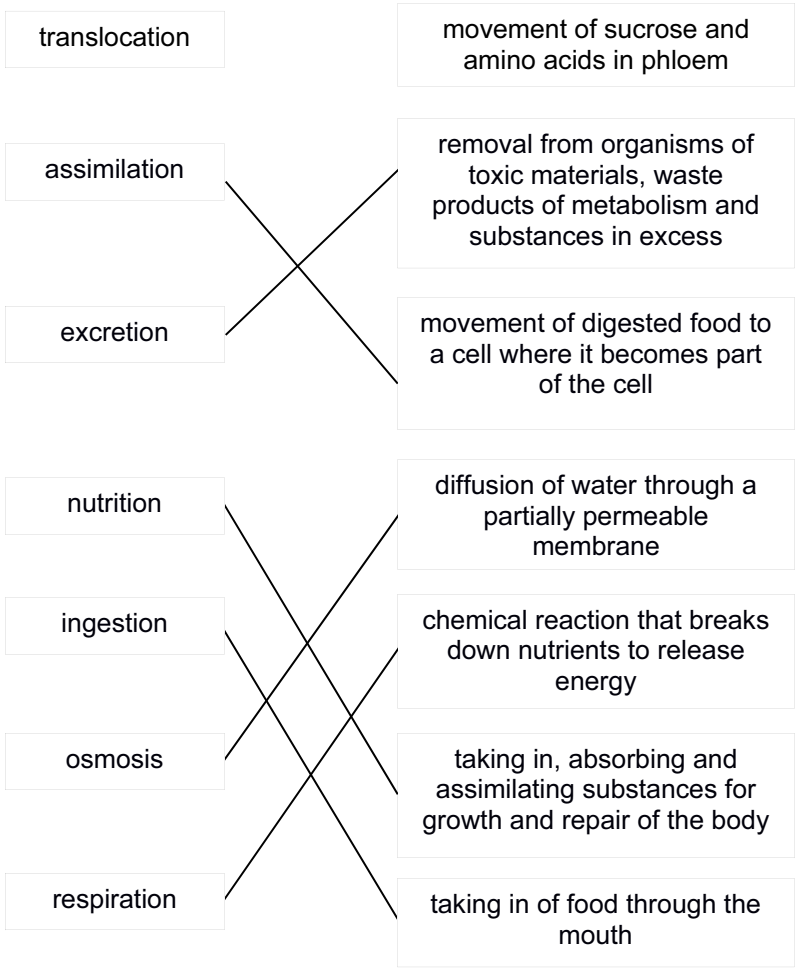
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Question	Answer	Marks	Additional Guidance
(ii)	36 (cm) ;	[1]	
(iii)	(×) 4 ;	[1]	
		[Total 19]	

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Question	Answer	Marks	Additional Guidance
4	*aesthetic reasons:* morally wrong to kill other species; wild life gives people, pleasure / psychological satisfaction or influences, art / design / literature / music ; *utilitarian reasons:* other organisms needed for food supply ; other organisms needed for resources ; biological control of pests ; pollination of food crops ; (chemicals basis of modern) medicines ; plant and animal studies important in development of new treatments ; micro-organisms used in technology ; genes used in transgenic organisms / genetic engineering ; some plants may produce important chemicals not yet discovered ; benefits local community and their economy ; *ecological / scientific reasons:* humans depend on fully functioning biosphere ; vegetation important in preventing soil erosion / flooding / desertification / silting of rivers ; vegetation important in controlling carbon dioxide levels that can lead to changes in weather patterns ; AVP ;	max [4]	**ignore** humans as the species to be conserved **ignore** resources unqualified
		[Total 4]	

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Question	Answer	Marks	Additional Guidance
5		[5]	**R** two lines in one box 6 correct = 5 marks 4 or 5 correct = 4 marks 3 correct = 3 marks 2 correct = 2 marks 1 correct = 1 mark
		[Total 5]	

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Question	Answer	Marks	Additional Guidance
6 (a)	plumule drawn and labelled growing upwards (originating at split in testa) ; radicle drawn and labelled growing downwards (originating at split in testa) ;	[2]	
(b)	geotropism ; phototropism ;	[2]	
		[Total 4]	
7 (a) (i)	**R** left atrium; **S** (left) atrioventricular valve / bicuspid valve / mitral valve ; **T** left ventricle;	[3]	**A** AV valve / tendinous chord
(ii)	it has to contract more strongly / pump blood a greater distance / around the whole body ; pump blood at higher pressure;	max [1]	
(iii)	muscular walls contract ; raises blood pressure ; direction of flow controlled by valves ;	max [2]	**A** valves between atria and ventricles close when ventricles contract; open ventricles relax;
(b) (i)	**X** aorta ; **Y** hepatic portal vein ;	[2]	

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Question	Answer	Marks	Additional Guidance
(ii)	<table><tr><th>description of blood</th><th>number of the blood vessels</th></tr><tr><td>has the highest concentration of oxygen</td><td>1 ;</td></tr><tr><td>has the highest concentration of urea</td><td>5 ;</td></tr><tr><td>has the lowest concentration of urea</td><td>4 ;</td></tr></table>	[3]	
(c)	not enough antibodies = **L** ; long clotting time = **N** ; quickly exhausted = **M** ;	[3]	
		[Total 14]	
8	homeostasis; brain; vasodilation; sweat; evaporation;	[5]	
		[Total 5]	
9 (a) (i)	group of organisms ; of same species ; living in same area ; at the same time ;	max [3]	**R** similar species

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Question	Answer	Marks	Additional Guidance
(ii)	food supply; other (named) resource; predation; disease; alien species / AW; AVP;	max [3]	**A** environmental changes
(b) (i)	**Q** = log / exponential phase; **R** = stationary phase;	[2]	
(ii)	population is declining / numbers of individuals reducing ; more individuals dying than being born ; food in short supply ; disease present killing individuals / predators killing more individuals / build-up of toxins / waste product ;	max [2]	
(iii)	long lag phase ; no stationary phase present; no death phase present; time in years as opposed to days;	max [3]	**A** description of phases
		[Total 13]	

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