



BIOLOGY

0610/32

Paper 3 Theory (Core)

May/June 2017

MARK SCHEME

Maximum Mark: 80

Published

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

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This document consists of **13** printed pages.

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

Question	Answer	Marks	Guidance																		
1	<table><tr><td>name of tree</td><td>letter</td></tr><tr><td>go to 2</td><td></td></tr><tr><td>go to 4</td><td></td></tr><tr><td>go to 3</td><td></td></tr><tr><td><i>Hedera</i></td><td>E</td></tr><tr><td><i>Magnolia</i></td><td>C</td></tr><tr><td><i>Quercus</i></td><td>A</td></tr><tr><td><i>Aesculus</i></td><td>B</td></tr><tr><td><i>Sorbus</i></td><td>D</td></tr></table>	name of tree	letter	go to 2		go to 4		go to 3		<i>Hedera</i>	E	<i>Magnolia</i>	C	<i>Quercus</i>	A	<i>Aesculus</i>	B	<i>Sorbus</i>	D	4	1 correct = 1 mark 2 correct = 2 marks 3 or 4 correct = 3 marks 5 correct = 4 marks
name of tree	letter																				
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<i>Sorbus</i>	D																				

Question	Answer	Marks	Guidance	
2(a)		5		
	process			letter
	ingestion			A ;
	mechanical digestion			A / D ;
	secretion of protease			D / E ;
	absorption of nutrients			F ;
	egestion			H ;
2(b)(i)	are <u>protein</u> (s) ; that function as biological <u>catalysts</u> ;	2	I speeds up reaction	
2(b)(ii)	fatty acid(s) ; glycerol ;	2	either order	
2(b)(iii)	carbon, hydrogen and oxygen ;	1		
2(b)(iv)	butter ; olive oil ;	2		
2(b)(v)	carbohydrate ; protein ; vitamins ; mineral salts ; fibre / roughage ; water ;	3	I fat A named vitamin once A named mineral once I examples of foods	

Question	Answer	Marks	Guidance
2(b)(vi)	for energy / respiration / metabolism ; insulation / thermal insulation / electrical insulation / myelin / maintains temperature ; storage of fat / vitamins ; making cell membranes ; protection (against mechanical damage) / cushions organs / shock absorber ; help body absorb vitamins / AW ; AVP ; e.g. hormones , buoyancy	1	A reduce heat loss / keeps body warm R insulin

Question	Answer	Marks	Guidance
3(a)		4	1 mark for each correctly linked hormone
3(b)	reduce blood glucose / sugar (concentration) ; or (promotes conversion of) glucose to glycogen ;	1	I regulates / controls
3(c)(i)	ovum / egg (cell) / ova ;	1	
3(c)(ii)	flagellum ; enzymes / acrosome ; small size / streamlined ; mitochondria (in flagellum) ; only one set of chromosomes / haploid ;	2	

Question	Answer	Marks	Guidance
3(c)(iii)	meiosis ;	1	
3(d)(i)	increased breathing rate ; dilates airways in the lungs; increased, heart / pulse rate ; pupil dilation ; increased blood pressure; increased / divert, blood to muscles; speeds up reaction time; AVP ;	2	A increased depth / volume of breathing A increased blood glucose concentration / increased metabolic rate A increased mental awareness
3(d)(ii)	<i>the following three boxes ticked</i> bungee jumping ; sitting an exam ; hearing a sudden noise ;	3	

Question	Answer	Marks	Guidance
4(a)	chemical ; cells ; nutrient ; oxygen ;	4	
4(b)(i)	80 (kJ) ;;	2	1 mark for correct working if answer wrong 1600 x 0.05 or equivalent calculation
4(b)(ii)	carbon dioxide ; water ;	2	either order
4(b)(iii)	muscle contraction / muscle doing work / (muscle) movement ; metabolism / enzyme reactions / chemical reactions / digestion; protein synthesis ; cell division / cell repair; active transport ; growth ; passage of nerve impulses ; maintenance of a constant body temperature ; excretion;	3	I exercise A reproduction A shivering / keep warm / homeostasis
4(c)	(muscle produces) lactic acid ; ora or (muscle) does not produce carbon dioxide / ethanol / alcohol ; ora	1	A ora only if yeast stated
4(d)	brewing / making alcoholic drinks / making beer / bread-making / biofuels / making ethanol / making carbon dioxide ;	1	A fermentation

Question	Answer	Marks	Guidance										
5(a)	(pulmonary) artery correctly labelled ; (pulmonary) vein correctly labelled ;	2											
5(b)	(presence of) valves ; thin(ner) walls ; wide(r) lumen ; less, muscular / elastic, tissues / fibres ;	2											
5(c)	<table><tr><th>component of blood</th><th>function</th></tr><tr><td>red blood cells</td><td>carries / transport oxygen ;</td></tr><tr><td>white blood cells</td><td>phagocytosis / antibody production / defence / immunity ;</td></tr><tr><td>platelets</td><td>clotting ;</td></tr><tr><td>plasma</td><td>transport of, blood cells / ions / (soluble) nutrients (named) / hormones / carbon dioxide / heat / urea / water / named molecule / enzymes ;</td></tr></table>	component of blood	function	red blood cells	carries / transport oxygen ;	white blood cells	phagocytosis / antibody production / defence / immunity ;	platelets	clotting ;	plasma	transport of, blood cells / ions / (soluble) nutrients (named) / hormones / carbon dioxide / heat / urea / water / named molecule / enzymes ;	4	
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Question	Answer	Marks	Guidance						
6(a)(i)	arrow pointing upwards for shoot and arrow pointing downwards for root ;	1							
6(a)(ii)	gravitropism ;	1							
6(b)	B – lack of / no, moisture / water ; C – lack of / no, oxygen ; D – (too) cold / lack of warmth / inappropriate temperature ;	3							
6(c)(i)	<table><tr><th>mineral ion</th><th>function in plants</th></tr><tr><td>nitrate</td><td>making, amino acids / proteins ;</td></tr><tr><td>magnesium</td><td>for chlorophyll ;</td></tr></table>	mineral ion	function in plants	nitrate	making, amino acids / proteins ;	magnesium	for chlorophyll ;	2	
mineral ion	function in plants								
nitrate	making, amino acids / proteins ;								
magnesium	for chlorophyll ;								
6(c)(ii)	root hair cell ;	1							

Question	Answer	Marks	Guidance
7(a)	small ears ; reduce heat loss ; or fur / coat ; reduce heat loss / insulation / keep body temperature constant; or white, hair/fur ; for camouflage ; or large body / small surface area to volume ratio ; reduce heat loss ; or large feet ; spread weight on snow / ice ; or dark / black nose lips ; heat absorption AW ;	2	explanation must relate to the given feature features must be visible in Fig. 7.1
7(b)	1 variation within, populations / organisms ; 2 more offspring produced than will survive ; 3 competition (for resources) ; 4 best adapted survive ; 5 best adapted reproduce ; 6 passing on their, alleles (to the next generation) ;	4	

Question	Answer	Marks	Guidance
7(c)(i)	<i>reasons for becoming endangered</i> climate change/ global warming ; habitat destruction / ice melting ; hunting / poaching ; pollution ; reduced (access to) food supply ; AVP ; e.g. disease <i>conservation methods</i> protecting habitats / national park ; ref to education ; captive breeding programmes ; zoos / wildlife park / sanctuary / protecting species ;	4	max 3 from either section

Question	Answer	Marks	Guidance								
8(a)(i)	<u>male 20–34</u> ;	1									
8(a)(ii)	16 (%) ;	1									
8(b)	<table><tr><th>component in cigarette smoke</th><th>effect on the body</th></tr><tr><td>carbon monoxide</td><td>reduces oxygen carrying capacity of blood / AW ;</td></tr><tr><td>tar</td><td>(named) cancer / irritates airways / damages cilia / COPD / emphysema / (stimulates) increased mucus production ;</td></tr><tr><td>nicotine</td><td>addictive / stimulant / increases blood pressure ;</td></tr></table>	component in cigarette smoke	effect on the body	carbon monoxide	reduces oxygen carrying capacity of blood / AW ;	tar	(named) cancer / irritates airways / damages cilia / COPD / emphysema / (stimulates) increased mucus production ;	nicotine	addictive / stimulant / increases blood pressure ;	3	
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8(c)	stress / too much salt in diet / too much fat in diet / obesity / genetic predisposition / age / gender / diabetes / cholesterol / lack of exercise / high blood pressure ;;	2									