Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/33**

Paper 3 Theory (Core) **May/June 2017**

MARK SCHEME

Maximum Mark: 80

Published

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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

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Question	Answer	Marks	Guidance
1(a)(i)	photosynthesis ;	**1**	
1(a)(ii)	water + carbon dioxide ; ➔ oxygen + glucose ;	**2**	
1(a)(iii)	large surface area (to absorb light) ; contain chloroplasts / chlorophyll (to absorb light) ; ref. to xylem ; stomata (to allow gas exchange) ; thin (short diffusion distances) ; transparent cuticle / epidermis ; AVP ;	**1**	
1(b)(i)	*Betula pendula* = **C** *Fraxinus excelsior* = **D** *Laurus nobilis* = **E** *Quercus robur* = **A** **;;;**	**3**	All 4 correct = 3 2 or 3 correct = 2 1 correct = 1

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Question	Answer	Marks	Guidance
1(b)(ii)	does leaf have only 5 parts? ; does the leaf have less than 7 parts? ; do the leaf parts all join at one place? ; does the leaf have more than one vein? ; does the leaf have branched veins? ; does the leaf have more than one vein in each part? ; does the leaf have pointy ends? ;	**1**	AW but the statement must fit a correct YES or NO choice

Question	Answer	Marks	Guidance
2(a)(i)	to pump blood / AW ;	**1**	
2(a)(ii)	(cardiac) muscle ;	**1**	
2(a)(iii)	ECG ; (counting the) pulse / heart beat ; using a, heart monitor / pulse monitor / blood pressure meter ; listening (to heart valves closing) ;	**2**	
2(b)(i)	a circle drawn around the coronary artery ;	**1**	
2(b)(ii)	*any one from* diet ; stress ; smoking ; genetic factors ; age / gender ; lack of exercise ; high blood cholesterol ; obese ; diabetes ;	**1**	**A** family history
2(b)(iii)	arteries veins ;	**1**	must have both in correct order

Question	Answer	Marks	Guidance
2(c)(i)	right atrium ;	**1**	**A** right auricle
2(c)(ii)	ensure one way flow of blood / prevent backflow ;	**1**	
2(c)(iii)	septum ;	**1**	

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Question	Answer	Marks	Guidance
3(a)(i)	hormones ;	**1**	
3(a)(ii)	line adrenaline joining to adrenal gland (above kidney) ; line insulin joining to pancreas ; line oestrogen joining to ovary ;	**3**	
3(a)(iii)	(insulin) pancreas ; (oestrogen) ovary ;	**2**	
3(a)(iv)	(Insulin) lowers blood, sugar / glucose *OR* (promotes conversion of) glucose to glycogen ; oestrogen causes lining of uterus to thicken / responsible for (named) secondary sexual characteristics ;	**2**	**I** regulates / controls **A** regulates the menstrual cycle
3(b)	*any two from* pupils are enlarge / dilated ; increased blood glucose concentration ; increased breathing (rate) ; increased, heart / pulse, rate ; increased blood pressure ; expand air passages of lungs ; increased / divert, blood to muscles ; speeds up reaction time ;	**2**	**A** increased depth / volume of breathing **A** increased mental awareness

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Question	Answer	Marks	Guidance
4(a)	break down of molecules ; large to small molecules / insoluble to soluble molecules ;	**2**	
4(b)(i)	amylase ;	**1**	
4(b)(ii)	simple sugars / glucose ;	**1**	**A** maltose / reducing sugar
4(c)(i)	**A** ; **B** ;	**2**	either order
4(c)(ii)	small intestine / ileum / duodenum ;	**1**	**A** villi
4(d)	*any two from* secretes (named) enzymes ; storage ; mechanical digestion / described ; secretes hydrochloric acid / provides an acidic pH (for enzymes) / lowers pH / adds liquid ; kills bacteria ; digests protein ;	**2**	

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Question	Answer	Marks	Guidance
5(a)(i)	37 / 38 (cm^3) ;	**1**	
5(a)(ii)	4 (minutes) ;	**1**	**ecf** from (a)(i)
5(a)(iii)	more juice extracted / bigger yield ; faster (extraction) / takes less time ; more profit ;	**2**	
5(b)(i)	(chemical reaction in cells that) breaks down, nutrient molecules, to release energy ; without using oxygen ;	**2**	
5(b)(ii)	biofuel / bread / carbon dioxide ;	**1**	**A** yeast extract / 'marmite' / CO_2 **I** any named alcohol
5(b)(iii)	uses oxygen ; releases more energy / makes more ATP ; produces water ; does not produce alcohol / ethanol ; AVP ;	**2**	e.g. produces more carbon dioxide

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Question	Answer	Marks	Guidance
6(a)	shoot grows upwards / AW ;	**1**	
6(b)(i)	gravity ;	**1**	
6(b)(ii)	gravitropism ;	**1**	
6(c)(i)	phototropism ;	**1**	
6(c)(ii)	the shoot grows towards the, light / stimulus ; (shoot) receives more light ; plants need light, to make food / for photosynthesis ; food / nutrients, needed for, growth / metabolism ;	**3**	

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Question	Answer	Marks	Guidance
7(a)(i)	<table><tr><td>meiosis</td><td>/</td><td></td><td>/</td><td></td></tr><tr><td>mitosis</td><td></td><td>/</td><td></td><td>/</td></tr></table> ;;	2	correct answer column 1 and 2 = 1 mark correct answer column 3 and 4 = 1 mark
7(b)	selection by humans / AW ; of individuals(s) with desired features / AW ; crossing / mating / breeding,(them together) ; selecting offspring with desired features and breed again ; over many generations ;	3	
7(c)	changing the, genetic material / DNA, of an organism ; by using genes ; from another organism ; (adding genes to) confer resistance to, herbicides / insect pests ; to make vitamins ; examples ;	4	**A** genetically modify an organism **A** alleles max 2 for examples **A** other examples include : salt tolerance / drought resistance / growth in harsh conditions nitrogen fixation virus resistance delayed ripening seedless watermelons flavr savr tomatoes make plants grow faster
7(d)	herbicides ; insecticide ; fertilisers ; irrigation / watering ; use of machinery ; crop rotation ; biological pest control ; more light ; AVP ;;	2	**I** weather e.g. pesticides / fungicide

Question	Answer	Marks	Guidance
8(a)(i)	**F** ; C **A / E** & **E / A** ; D **B** ;	**3**	1st box **F** 1 mark 6th box **B** 1 mark both **A E** or **E A** in the middle 1 mark
8(a)(ii)	mutation ;	**1**	
8(a)(iii)	mutagens / (named) chemicals e.g. cigarette smoke / dyes ; radiation / x rays / UV ; viruses ;	**1**	
8(b)(i)	an inherited feature ; that helps an organism to survive / reproduce ; in its environment ;	**2**	
8(b)(ii)	they all have, hair / fur ; all have (external) ears / pinnae ; middle ear bones ;	**2**	must be visible features
8(b)(iii)	mammary glands / production of milk (for offspring) / nipples ;	**1**	
9(a)	plasma – not clotting platelets – burns patients red blood cells – low immunity white blood cells – low haemoglobin	**3**	All 4 correct = 3 2 or 3 correct = 2 1 correct = 1
9(b)(i)	rounder / (bi)concave / fixed shape / disc shaped / doughnut shaped ; lacks a nucleus ; it contains haemoglobin ; smaller ;	**2**	**I** colour

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Question	Answer	Marks	Guidance
9(b)(ii)	to prevent (further) blood loss / haemorrhage ; to seal wounds / as a barrier to infection idea / stop pathogens entering ;	**1**	

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