UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2010 question paper for the guidance of teachers

0610 BIOLOGY

0610/61 Paper 6 (Alternative to Practical), maximum raw mark 40

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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UNIVERSITY of CAMBRIDGE
International Examinations

Questions	Mark Scheme		Guidance/comments
1 (a) (i)	<table><tr><th>temperature / °C</th><th>volume of juice collected / cm^3</th></tr><tr><td>10</td><td>2</td></tr><tr><td>15</td><td>11</td></tr><tr><td>20</td><td>15</td></tr><tr><td>25</td><td>20</td></tr><tr><td>30</td><td>26</td></tr><tr><td>5</td><td>27</td></tr></table> ;;;	[3]	Lose 1 mark for each error.
(ii)	Graph plot **A** – axes – orientation and labels; **S** – suitable scale, plots to fill ½ or > ½ grid; **P** – plots;; **L –** neat line passing through all points;	[5]	*x*-axis - temperature / °C and *y*-axis – volume / cm^3 If incorrect scale penalised allow correct plot for that scale. +/– 0.5 square for points and line. Lose 1 mark for each error. Point to point ruled line or smooth curve passing through all points. No extrapolation. Allow e.c.f.
(iii)	increase in temperature – greater volume of juice collected ORA; almost the same volume / lowest increase in volume between 30 °C and 35 °C / AW; larger volume / largest increase between 10 °C and 15 °C;	[max 2]	**I**. direct quotes of figures, need trend **I**. reference to optimum **I**. flattens at 35 °C

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(b)	**1.** range of different pHs; **2.** detail of method planned / control of pH – use of buffers; **3.** same type pulp or apple or same volume / amount pulp or apple; **4.** same volume / mass of enzyme; **5.** same concentration enzyme; **6.** same temperature; **7.** same timings; **8.** filtration; **9.** allow for repeat readings; **10.** calculate mean; **11.** plot data in graph form; **12.** safety feature e.g. goggles / lab. coat / tongs;	[max 6]	Need reference to minimum 3 different pHs **A**. several / many **A**. methods to alter pH e.g. using different (named) acids and / or alkalis or changing amounts / drops / volumes of acids and / or alkalis **I**. record the data **I**. gloves 'Keep all conditions the same' = 1 if no marks awarded for points **3, 4, 5, 6 or 7.**
		[Total: 16]	

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2 (a)	**Drawing:** **O:** clear outline, drawing same size or larger than photograph; **P:** reasonable proportions of parts of leg; **D:** detail mark e.g. hairs / detail of segments at the end / claws / presence of segment attached to abdomen; **Labels: any 2 from** joint / segment / jointed legs; hairs; claw;	[max 5]	**R**. sketchy outline / incomplete outline (take account of scanning) / shading **A**. three parts, largest at the top, medium then smallest end part **I.** individual segments on end part **I**. segment of leg attached to abdomen **R**. parallel sided segments **A**. articulation **A**. hooks **I**. fur **I**. pointed end
(b) (i)	20 +/– 1 (mm);	[1]	
(ii)	working: $\frac{\text{measurement from (i)}}{500}$; 0.04 (mm);	[2]	**A**. correct diameter = 2 marks **A.** 0.038 – 0.042mm Allow e.c.f **A**. 4×10^{-2}

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(c)	**Any four from** safety feature e.g. goggles / tongs / lab. coat / water bath; <u>*Starch*</u> iodine solution; colour change expected – (brown) to blue / black (if present) ; <u>*Reducing sugar*</u> Benedict's solution / correct chemicals / Clinistix; heat; colour change expected;	[max 4]	**I**. gloves **I**. iodine **A**. drops of iodine **I**. reference to boiling for starch test Benedict's – green / orange / brick red (if present) Clinistix – (pink -) purple (if present) For each test do not award expected colour change if incorrect reagent. **N.B**. Colour changes must be correctly linked to starch or reducing sugar
(d) (i)	it is a pest / causes harm / AW; lives on (adult) bees / (their) larvae; sucks / blood /AW; AVP;	[2]	**I**. 'affects' organism if unqualified **A.** correct reference to harm within a general definition of a parasite
(ii)	**Mark independently :** *honey bee* – insecta; *feature* – wings / 3 pairs or 6 legs / 3 body parts or head + thorax + abdomen / 1 pair of antennae / (1 pair of) compound eyes; *parasite* – arachnida; *feature* – 4 pairs of legs;	[4]	**A**. insect / insectoid **I**. features common to arthropods e.g. jointed limbs **A**. arachnid / arachnoid **I**. spider **I**. 4 or more pairs of legs **I**. negative features **I**. incorrect features
		[Total: 18]	

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3 (a)	more with straight thumb ORA; correct reference to figures for gender e.g. **straight**: 84 males and 87 females / more females / less males **and /or** **hitch hiker**: 12 males and 14 females / more females / less males; independent of their age /AW;	[3]	**A**. correct reference to figures e.g. 171 straight and 26 hitch hiker or approx 87% straight / 13% hitch hiker. **A**. independent of gender; **I**. references to figures or differences in age groups. **A**. varies with age
(b)	discontinuous variation ; no range of results / only two types /AW; hitch hiker thumb recessive (allele); straight thumb dominant (allele); not linked to sex / gender; not affected by age;	[max 3]	 **I**. gene **I**. codominant **I**. Punnett squares
		[Total: 6]	

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