CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2013 series

5090 BIOLOGY

5090/31 Paper 3 (Practical Test), 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.

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

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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Mark schemes will use these abbreviations

- **;** separates marking points
- **/** alternatives
- **()** contents of brackets are not required but should be implied
- **R** reject
- **A** accept)for answers correctly cued by the question, or guidance for examiners)
- **Ig** ignore (for incorrect but irrelevant responses)
- **AW** alternative wording (where responses vary more than usual)
- **AVP** alternative valid point (where a greater than sual variety of responses is expected)
- **ORA** or reverse argument
- **underline** actual word underlined must be used by candidate (grammatical variants excepted)
- **max** indicates the maximum number of marks that can be given
- **+** statements on both sides of the + are needed for that mark

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<table>
<tr><th>Question</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>1 (a)</td><td>add Benedicts/Fehlings solution;

heat/warm/temp 60+;

blue to green/yellow/brown (qualified)/orange/red;

safety – ref water bath/goggles</td><td>[max 3]</td><td>A pink to purple/blue to brown</td></tr>
<tr><td>(b)</td><td><table>
<tr><td>time/mins</td><td>reducing sugar test</td><td>starch test</td></tr>
<tr><td>0</td><td>obs: blue/no change

con: negative/AW;</td><td>brown

negative/AW;</td></tr>
<tr><td>20</td><td>obs: green/yello/orange/red

con: positive;</td><td>brown

negative/AW;</td></tr>
</table></td><td>[4]</td><td>One mark for each block.

A no change for brown in the starch test.</td></tr>
<tr><td>(c)</td><td>1. diffusion;
2. from higher concentration to lower concentration/down concentration gradient;
3. starch cannot pass/move out;
4. glucose can pass/move out;
5. reference to size of molecules;
6. no energy needed;</td><td>[max 5]</td><td></td></tr>
<tr><td>(d)</td><td>ileum/small intestine/cilus/AW;
absorption of glucose/reducing sugar/smaller//soluble molecules;
(into) blood (water);</td><td>[3]</td><td></td></tr>
<tr><td>(e)</td><td>remove sugar solution/no glucose in water at start/AW</td><td>[1]</td><td></td></tr>
<tr><td></td><td></td><td>[Total: 16]</td><td></td></tr>
</table>

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<table>
<tr><td>2 (a) (i)</td><td>
<table>
<tr><td></td><td colspan="2">colour of universal indicator</td><td>pH</td></tr>
<tr><td>fresh milk</td><td>yellow/green</td><td>+</td><td>7</td></tr>
<tr><td>yoghurt</td><td>orange/red</td><td>+</td><td>4</td></tr>
</table>
</td><td>[2]</td><td>one mark for observation and pH

check Supervisor’s report</td></tr>
<tr><td>(ii)</td><td>yoghurt: thicker/creamy + milk: thinner/more ‘runny’</td><td>[1]</td><td>both materials needed or comparative terms used

R rough/soft</td></tr>
<tr><td>(b)</td><td>bacteria produce acids/reduces pH;
acids change milk protein;
milk becomes thicker/creamy in texture;</td><td>[max 2]</td><td>A tastes sour</td></tr>
<tr><td>(c)</td><td>Spheres (circular, cylindrical) and rods (capsule-like, tubular, long);
bacilli/cocci;
some multiply/divide/have divided/ref mitosis</td><td>[max 2]</td><td>R if names are linked to incorrect shape
A joined if qualified to imply division</td></tr>
<tr><td>(d) (i)</td><td>1. time on x axis + number on y axis;

2. axes fully labelled;

3. linear scales to fill at least half the grid;

4. correct plots;

5. clean neat line, ruled to join plots, smooth curve through plots</td><td>[5]</td><td>2. minimum x: t/hrs
y: no. of bacteria/millions

4. plots must be visible
A x, +, dot or circled dot

5. R if extrapolated back to 0 if bar chart 2, 3. and 4. only</td></tr>
<tr><td>(ii)</td><td>used up all of the sugars/nutrients/build-up of toxic end product/acidity too high AW</td><td>[1]</td><td>R milk used up
A pH too low qualified</td></tr>
</table>

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(e)	**1.** same volume/source/type of milk; **2.** same mass/type of bacteria added; **3.** different temps (at least two) identified; **4.** temps identified within a suitable range; **5.** measure time taken for yoghurt to form; **6.** repeat to obtain mean value;	[max 4]	**A** at least 3 temperatures in the range of 5–50 C. **R** amount/quantity of milk **A** amount/quantity/volume/number for mass of bacteria **A** rate/speed of yoghurt production/time taken for pH to reach 4
		[Total: 17]	
3 (a) (i)	**1.** clear outline; **2.** good size/proportions (at least 9 cm) **3.** anthers delimited and filaments with double line; **4.** stigma lower than anthers and wider than style; Three labels for stamen + stigma + style;	[5]	**R** if lines shaded elsewhere
(ii)	tubular flower/stamens in tubular structure; large stigma/not feathery; stigma above stamens; large/conspicuous/brightly coloured petals/honey guides; female and male reproductive parts **AW** enclosed;	[max 2]	**A** scent **A** honey guides
		[Total: 7]	
		[40]	

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