CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2013 series

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.

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 October/November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

CAMBRIDGE
International Examinations

Mark schemes will use these abbreviations:

- **;** separates marking points
- / alternatives
- R reject
- A accept (for answers correctly cued by the question, or guidance for examiners)
- AW alternative wording (where responses vary more than usual)
- underline actual word given must be used by candidate (grammatical variants excepted)
- D, L, T, Q quality of drawing / labelling / table / writing as indicated by mark scheme
- max indicates the maximum number of marks that can be given

<table>
<tr><th>Question</th><th>Mark Scheme</th><th>Mark</th><th>Guidance</th></tr>
<tr><td>1 (a)</td><td>
<table>
<tr><td></td><td>lentil</td><td>chickpea</td><td>soya bean</td></tr>
<tr><td>shape of seed</td><td>round / circular / disc-like / biconvex/ flat & round / AW</td><td>circular / round / spherical / irregular / pointed / tear shape / AW</td><td>elongate / oval / AW</td></tr>
<tr><td>appearance of seed coat</td><td>varied / speckled / patterned / AW</td><td>uneven / ridged / rough / AW</td><td>even / smooth / uniform / AW</td></tr>
</table>
</td><td>[3]</td><td>Any two boxes correctly completed = 1 mark</td></tr>
<tr><td>(b)</td><td>variable to change: temperature;
variable to measure: number of seeds (germinated);</td><td>[2]</td><td></td></tr>
<tr><td>(c) (i)</td><td>Drawing of lentil seedling from Fig. 1.2

O – outline;

S – size;

D – fork in first leaf and split testa revealing cotyledon;

L – two labels;</td><td>[4]</td><td>R. shading
R. sketched / artistic lines

Drawing larger than photograph (> 61 mm)

A. labels: radicle / root / stem / shoot / plumule / leaf / cotyledon / testa / seed coat.
I. Label lines which do not touch the part or cross.</td></tr>
</table>

(ii)	*Magnification of drawing* measurement: 61 ±1 [mm]; measurement of ST on their drawing ±1 [mm]; formula: drawing length ÷ original length; correct magnification;	[4]	mm given in question, If different unit e.g. cm, then units must be present. **R.** no clear indication of ends of line between S and T but allow e.c.f .for calculation. If correct answer then award last 2 marks irrespective of formula. If incorrect answer then award 1 for correct working. **R.** if incorrectly rounded e.g. 2.6 for 2.66
(d) (i)	*Protein test* add <u>biuret</u> solution / biuret A and B / biuret 1 and 2 / copper sulphate and potassium / sodium hydroxide; <u>blue</u> to purple / mauve / lilac / AW;	[2]	**A.** correct chemical symbols **I.** copper sulphate or sodium / potassium hydroxide alone **A.** other correct tests**.** e.g. Xanthoproteic – yellow to orange Millons – flesh to reddish brown albustix – yellow to green **R.** if heated or boiled.
(ii)	*Fat test* add alcohol / ethanol; pour / add to water; white / cloudy / emulsion formed / AW;	[3]	Max 2 if describe grease spot test.

(e) (i)	*Plotting bar chart* **A** – label axes and even scale; **S** – size plots to fill half or more on both axes; **P** – plot; **C** – columns do not touch; **K** – key or label [protein and fat];	[5]	**A.** vertical or horizontal bars. Line graph max 3, **A,S** and **K** **I.** graphs drawn side by side or above one another on the grid. Minimum accepted = names of beans and %. Do not award if columns exceed printed grid. If no scale / no seeds labelled, P = 0 Accurate to ±0.5 of grid square. **P.** allow 2 errors. **A.** protein and fat columns touching if space between different seed columns. **R.** columns of unequal widths.
(ii)	soya (bean);	[1]	
(f)	*measure–* starting and final temperature / change in temperature; *control–* mass of sample / volume of water / distance of flame to tube; one safety measure: fume cupboard / tongs AW / lab coat / goggles / correct ref. to hair / ties;	[3]	
		[Total: 27]	

<table>
<tr>
<td>2 (a) (i)</td>
<td>Dark green outer tissue

In solution E – more curved AW;

In water – curve straightened / dark green tissue on inside of curve / AW;</td>
<td>[2]</td>
<td>A. horseshoe shape / curved inwards / curled up / expanded / lengthened / stretched / grew AW
I. curved alone

A. opened out / curved outwards
I. reference to length</td>
</tr>
<tr>
<td>(ii)</td>
<td>Pale green inner tissue

In solution E – more curved AW;

In water – curve straightened / bent backwards / inner pale green tissue on outside of curve / AW;</td>
<td>[2]</td>
<td>A. horseshoe shape / curled up / expanded / lengthened / swollen / stretched / grew AW
I. curved alone / wider

I. contracted / shrink / swell / wider</td>
</tr>
<tr>
<td>(b)</td>
<td>Three from:

<table>
<tr><td>solution E more concentrated / stronger / has less water / lower water potential / ORA for tissues;</td><td>solution E more dilute / weaker / more water / higher water potential / ORA for tissues;</td></tr>
<tr><td colspan="2">water moves by osmosis;</td></tr>
<tr><td>(water moves) out from cells / tissues;</td><td>(water moves) into cells / tissues;</td></tr>
<tr><td>cells / tissues become flaccid plasmolysed;</td><td>cells / tissues become turgid;</td></tr>
</table>
</td>
<td>[max 3]</td>
<td>Answers must all come from one column.

Must be comparative.</td>
</tr>
</table>

<table>
<tr>
<td>(c)</td>
<td>One source of error and one linked improvement
<table>
<tr><td>Source of error;</td><td>Improvement;</td></tr>
<tr><td>slice cut too thick</td><td>use of sharper cutting tool</td></tr>
<tr><td>cut unevenly</td><td>cut halves equally</td></tr>
<tr><td>pieces not submerged with liquid AW</td><td>both pieces must be submerged</td></tr>
<tr><td>pieces placed in solutions at different times</td><td>pieces placed in solutions at same time</td></tr>
<tr><td>only one piece tested in each solution / anomalous AW</td><td>repeat</td></tr>
<tr><td>kept in different temperatures</td><td>keep at same temperature</td></tr>
</table>
</td>
<td>[2]</td>
<td>I. range of solutions

Improvement must be linked to source of error.</td>
</tr>
<tr>
<td></td><td></td><td>[Total: 9]</td><td></td>
</tr>
</table>

3 (a) (i)	*Two similar visible features from*: tentacles; foot; unsegmented body / no segments AW;	 [max 2]	**I.** sense organs / eyes / antennae **I.** shape of body **I.** slimy / mucus / soft **I.** no legs
(ii)	*One difference*: shell;	 [1]	**A.** darker **A.** different number tentacles **A.** shiny
(b)	*Any one from:* protection qualified e.g. against predators / (named) environmental factor; prevent desiccation;	 [max 1]	**I.** shelter / hiding alone **A.** waves / wind **A.** camouflage /hiding if qualified e.g. from predators
		[Total: 4]	