

**MARK SCHEME for the May/June 2012 question paper  
for the guidance of teachers**

**5090 BIOLOGY**

**5090/61**

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 must be read in conjunction with the question papers and the report on the examination.

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

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- 1 (a) volume of dough / cm<sup>3</sup>
- |         | <b>A</b> | <b>B</b> |     |
|---------|----------|----------|-----|
| Initial | 20       | 20       |     |
| Final   | 51       | 34       |     |
| Change  | 31       | 14       | [3] |
- (b) (i) volume / height (increases) more in A than B ;  
more bubbles / gas in A / bubbles / gas evenly distributed in A or converse ; [2 max]
- (ii) respiration / respiring ;  
aerobic / anaerobic ;  
carbon dioxide (CO<sub>2</sub>) given off ;  
(idea of) trapped in dough increasing volume AW ; [3 max]
- (c) 2 or more samples (of A) used / AW ;  
same start volumes / amounts / height of dough used ;  
at range of temperatures / different temps ;  
suitable temperatures identified ;  
left for same length of time ;  
change (in volume) measured / compared AW ;  
repeat / replicate / calculate the mean ;  
AVP ; [5 max]
- [Total: 13]**
- 2 (a) **Drawing**  
five leaflets drawn ;  
clean lines, good proportions, at least 7cm length ;  
midrib + veins well drawn on at least one ;  
  
serrated margin drawn as a continuous line on one ; [4 max]
- Labels**  
lamina / blade / margin ;  
midrib / veins ;  
petiole / leaf stalk ; [L2 max]
- (b) photosynthesis:  
(green) chlorophyll + ref to light (absorption) ;  
large surface area + ref. to light or gases ;  
attached to stem / veins / midrib + transport of correctly named materials ;  
leaf thin + fast diffusion / light penetration / gaseous exchange ; [3 max]
- (c) (i) reference to leaf closing over insect / leaf margins forming trap AW ; [1]
- (ii) nitrate / (named) nitrogen-containing compound / phosphate ; [1]
- (iii) enzymes / proteins / nucleic acids / DNA / cell membrane / chlorophyll / ATP ; [1]
- [Total:12]**

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- 3 (a) (i)** stamen / anther / pollen sac correctly indicated and named ; [1]
- (ii) stigma correctly identified and named ; [1]
- (b)** tissue prepared or sample taken ;  
 Benedicts added ;  
 heated / warmed ;  
 colour changes described ;
- use of water bath or another safety feature ; [5]
- (c) (i)**
- | time in hours | length / mm |
|---------------|-------------|
| 0.0           | (0)         |
| 2.0           | 18–20       |
| 4.0           | 23–25       |
| 6.0           | 28–30       |
| 8.0           | 34–36       |
| 10.0          | 41–43       |
- [2]
- (ii)** time on x axis, length on y ;  
 grid fully used and axes fully labelled with linear scales ;  
 plotting correct ;  
 good, neat line of best fit drawn ; [4]
- (iii)** growth (rate) faster (at first) becoming constant / AW ; [1]
- (d)** towards chemical / hormone (in ovule) ; [1]

**[Total: 15]**

**[Paper total: 40]**