

CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

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MARK SCHEME for the October/November 2012 series

5090 BIOLOGY

5090/62

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

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

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Page 2	Mark Scheme	Syllabus	Paper
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- 1 (a) (i) 10 minutes ;
5 minutes ; [2]
- (ii) speeds up / increases (rate of) reaction **OR** decreases time taken / **AW** ;
twice / x2 **OR** half; [2]
- (b) (i) make observation of colour / results, clear(er) / (more) easily seen / **AW** ; [1]
- (ii) mix the contents / **AW** ; [1]
- (iii) same (total) volume (of liquid) in each test-tube / **AW** ;
instead of sodium chloride solution ; [2]
- (iv) same / equal (volume of substrate / starch solution) in each; [1]
- (v) reference to control / comparison / prove enzyme in A active / **AW** ; [1]
- (c) (i) 1. axes correctly orientated, pH on x, time on y + fully labelled pH and time with units ;
2. scale on y axis such that graph fills at least half printed grid and both scales linear,
increasing from the origin ;
3. plots clear and all correct ;
4. curve either cleanly drawn through most plots or plots neatly joined by (ruled) lines;
R. if line extrapolated to 0 (zero) on y axis at either end [4]
- (ii) 5 ; [1]
A. if not 5 but the correct reading from the graph drawn is given
- (iii) activity increases as pH increases up to optimum / pH5 ;
after optimum activity decreases as pH increases ;
high / low pH denatures / inactivates enzyme / enzyme (gradually) stops working ;
changes shape of active site of enzyme ;
A. enzyme destroyed
R. enzyme killed

[Max 3]
[Total: 18]

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- 2 (a) (i) Drawing:
 at least 80 mm (left to right) + outline drawn with smooth clear continuous line and no shading anywhere ;
 good proportions with wider area between testa and cotyledon on right hand side than elsewhere ;
 radicle and plumule well drawn ;
- Labels:
 testa / seed coat ;
 cotyledon;
 radicle + plumule ; [6]
- (ii) correct measurements in mm recorded on given lines or on Fig. 2.1 and drawing;
 correct expression used ;
 allowance made for x4 magnification of Fig. 2.1 ;
 correct calculation anywhere with x or times and no units and *no more than 2 dps* or 2 sig. figs; [4]
- (b) (i) the groundnut / it
 (fruit) is shorter / wider / smaller ;
 (fruit) more rounded / no point v point present;
 has fewer seeds ;
 has larger seeds;
 has more closely packed seeds / no gaps v gaps; [Max 3]
 all must be comparative ;
- (ii) mass / weight / volume of seed constant / same amount ;
 grinding / **AW** of seed ;
 (add) biuret (reagent/solution) ;
 constant volume of reagent / biuret / sodium hydroxide (+ drops of copper sulfate);
 blue becomes purple / mauve / violet / lilac / **AW** (if protein present) ;
 comparison (of results / colour) ; [Max 4]
- [Total: 17]**
- 3 (a) one bone in **upper part** ;
 two bones in **lower part** ;
 (these) two bones side by side ;
 (these) two bones cross over
 long bone(s) (compared to width) ;
 5 digits / pentadactyl ;
A. fingers for digits
 many bones in hand/wrist and foot/ankle ; [Max 3]

Page 4	Mark Scheme	Syllabus	Paper
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(b) X (like) hinge / up and down / one plane / two directions or dimensions / 180° / backwards and forwards;

A. bends and straightens

Y (like) ball and socket / rotation / 2 planes / all directions / 360° ;

A. 3 dimensions

[2]

[Total: 5]

[Paper Total: 40]