CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2012 series

5090 BIOLOGY

5090/62 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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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 <u>in mm</u> 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]

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(b) **X** (like) hinge / up and down / one plane / two directions or dimensions /180^{o} / backwards and forwards;
A. bends and straigtens

Y (like) ball and socket / rotation / 2 planes / all directions / 360^{o} ;
A. 3 dimensions [2]

[Total: 5]

[Paper Total: 40]

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