MARK SCHEME for the October/November 2007 question paper

0610 BIOLOGY

0610/05   Paper 5 (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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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

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1 (a) (i) *table design*
border and columns and rows with ruled lines ;
columns/rows , with headings ;   [2]

(ii) *filling in their table*
if film did not clear, (A) 'no change' or an explanation for missing time
time for pH 4 ;
time for pH 8 ;
suitable units (in heading or in each box) ;   [3]

(b) (i) A axes correctly orientated ;
 L labels on axes + units for time ;
 S even scale (should include 0) ;
 P plot 5 points correctly ;
 R ruled line point to point of the plotted 5 points (not pH 4 and 8) ;   [5]

(ii) most active/optimum/works best **,** at pH 7 ;   ***(A) neutral***
                                                          (A) within 6.5 – 8 as a range

less active/slower , at , acid/low , pH ;
less active/slower , at , alkaline/high , pH ;   ***(A) use of figures to make the points***
denatured enzyme ;   ***(A) description***   [3 max]

(iii) own results plotted ; ***look at their results table ~ to within half a square***
                        [N.B. tube A (+C) is pH8, tube B (+D) is pH4]   [1]

(iv) 1 different enzyme/enzyme has different optimum pH ;
 2 different <u>concentration</u> of enzyme ;
 3 different <u>volume</u> of enzyme ;

 4 carried out at <u>different</u> temperature ;   ***(R) temperature has an effect***
 5 different , shaking/stirring ;

 6 different , type of film/amount of protein on film ;
 7 different sized pieces of film ;   [2 max]

(c) 1 same volume of enzyme ;
 2 same concentration of enzyme ;
 3 same volume of substrate ;

 4 same concentration of substrate ;
 5 repeats ;

 6 carry out , for stated range of/at (at least 3) different stated , temperatures ;
 7 ref. to maintaining pH/carry out at optimum pH ;
 8 ref. same , shaking/stirring/agitation , of tube ;   [4 max]

[Total: 20]

2 (a) (i) *drawing* ~ clear outline ;
includes petiole ;

labels ~ midrib/main vein ;   *(R) mid vein*
network of/branching/lateral , veins ;   *(R) parallel/veinlets*
petiole/leaf stalk ;   *(R) 'stalk' alone*
lamina/leaf blade ;   [5 max]

(ii) *expect comparative statement unless it is clear that one surface <u>only</u> has the feature*

(upper surface)
veins less prominent ;
more shiny ;
darker colour ;
smoother/waxy ;
fewer/no , stomata ;   [2 max]

(b) (i) total (+ correct units) ;   [1]

(ii) means of , scoring/marking off , squares to avoid miscounting ;
number of whole squares ;
attempt to include the part squares ;   [2 max]

(c) (i) bubbles on lower surface <u>and</u> , none/few , on upper surface ;
                                                 (A) <u>more</u> bubbles on lower surface   [1]

(ii) air/gas , (trapped) in , leaf/intercellular spaces ;
air expands ;
air escapes through stomata (on lower surface) ;
more stomata on lower surface ;   [2 max]

(d) (i) epidermal cell ;
guard cell ;   [2]

(ii) (at least 2) guard cells <u>only</u> circled ;   [1]

(e) 1 suitable use of microscope ;
2 preparation of epidermis on slide ;   *(A) nail varnish peel*
3 detail ; e.g. cover with water & coverslip/use of staining

4 count the number of stomata in , field of view/given area ;
5 determine the area viewed in which stomata were counted ;
6 calculate the area of leaf/ref. to calculation in **(b)** ;
7 multiply up for the whole leaf ;   [4 max]

                                                 [Total: 20]