

MARK SCHEME for the May/June 2007 question paper

5090 BIOLOGY

5090/06

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.

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)

(elapsed) time /min	first expt temp/°C	second expt temp/°C
0	20	20
2	29	24
4	34	28
6	37	
8	39	32
10	40	34

table marks:

- 1 single table neatly ruled, complete and closed 3 columns only
- 2 all data entered in separate boxes, no units etc.
- 3 correct titles in column headings (time, 1st and 2nd expt)
- 4 units correctly stated in each column (min. and °C) [4]

(ii) graph marks:

- 1 correctly labelled and numbered axes (esp. y-axis near origin)
- 2 plots clear and accurate
- 3 lines identified/labelled
- 4 curve of best fit OR ruled connections [4]

axes reversed: allow point 2 for clear plots, and point 3. bar: allow 1 and 3.

(iii) 30–31°C (check if outside this range) [1]

(iv) 6 (°C) [1]

- bottle absorbs heat/heat enters ;
- bottle in 1.2 loses heat/ref. cooling system etc. ;
- ref. flow of water, AW ; [3]
- [beware temp. cf.heat]

(b) (i) body temp ; [1]

(ii) to mix/ensure uniform temp/heat ; [1]

(iii) view at right angles/leave in water/use hand lens/read bottom of meniscus ; [1]

(c) (i) urine/sweat/breath ; [1]

(ii) [must match (i)] by evaporation/warm so removing heat ; [1]

- (d) tie dry cloth (A: no cloth) round beaker ;
 read temp. regularly/start and end of process etc. ;
 (record temp at) at specified reasonable intervals ;
 (repeat) with wet cloth ;
 use same volume of water ;
 plot graphs/record or tabulate data ;
 repeat experiments ; [max. 5]

[Total: 23]

Page 3	Mark Scheme	Syllabus
	GCE O LEVEL – May/June 2007	5090

- 2 (a) (i) drawing and labelling marks:
1. min 7 cm, realistic, clear and clean, 3-5 veins, R: if too opposite.
 2. petiole and marginal dentation reasonable.
 3. labelling: of vein – midrib – lamina/blade – /petiole/leaf stalk . D.3
- (ii) width of leaf = 38 mm (± 2) ; [2]
line ruled (and measured) ; (units once minimum)
- (iii) expression of drawing measurement over actual ; [2]
mag. accurate ($\pm 0. 2$) ;
[Accept: x1 or x2, but probably nearer x1.5, in which case expect 1 or 2 d.p.]
- (b) (i) **B:** looks dry/curled/shrivelled/wilted/crumpled AW ; R:colour [3]
C: less so than leaf B/side folded over etc ;
D: like leaf A/fresh/normal/not curled etc ; R:turgid etc.
- (ii) ref. transpiration/water (vapour) loss ; [2]
ref. how stomata involved/(G.cells) blocked etc ;
- (c) (i) drawing marks: D.2
1. at least 7 cm, clear, good shape, ridges on upper side.
 2. bundles reasonably drawn.
- labels: vascular bundles/veins/xylem ; [1]
- (ii) (in xylem of) vein/midrib/petiole/vascular bundle ; [1]
- (iii) central xylem/stained tissue indicated ; [1]

[Total: 17]