

## MARK SCHEME for the May/June 2008 question paper

### **5090 BIOLOGY**

**5090/03**

Paper 3 (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)

test-tube / no.	total s. area / cm <sup>2</sup>	time <b>A2</b> added	time change complete	time elapsed
1	6			
2	12			
3	8			

- marks: 1 format as shown  
 2 table ruled and joined up  
 3 titles and units as appropriate in headers  
 4 s/area calculations correct  
 5 all boxes sensibly completed [5]

- (b) (i) graph marks: [5]  
 1 axes correct (x – surface area / volume, horizontal, etc.)  
 2 labelled ‘surface area / volume ratio’ and ‘time / secs’  
 3 correct scale, good size  
 4 plots clear and accurate  
 5 good line of best fit / ruled connections, bar chart: allow 1, 2 and 4 only

- (ii) bigger s/a vol. ratio – faster diffusion rate ; [1]

- (c) determination of end point ;  
 accuracy of block size ;  
 clumping effect of blocks on surface area etc. ;  
 ovp ; e.g. active transport, etc. [up to 2]

- (d) living cell has cell membrane ;  
 cytoplasm present ;  
 uneven shape ;  
 ovp ; [up to 2]

- (e) correct apparatus assembly diagram ;  
 same size blocks of agar ;  
 different temperatures ;  
 range of temperatures suggested ;  
 record data / plot graphs ;  
 control another variable e.g. better method of block production ;  
 replication / repeats ;  
 ovp ; [up to 6]

**[Total: 21]**

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- 2 (a) (i) drawing marks: [D.3]
- 1 clear, clean, at least 8 cm
  - 2 variegation shown (not just shaded)
  - 3 petiole shown, well attached
- labels: 2 correct from:  
green and white areas / variegated ,  
petiole / leaf stalk ,  
blade / lamina [1]
- (ii) width of **L1** with units correct ;  
line drawn and correctly measured with units ; [2]
- (iii) working expression correct ;  
magnification correct and well expressed ; [2]
- (b) (i) increases permeability / denatures enzymes / stops reactions ; [1]
- (ii) remove chlorophyll / decolourise ; [1]
- (iii) test for starch ; [1]
- (c) starch produced where chlorophyll present ;  
white area produces no starch ;  
chlorophyll harnesses light / energy ;  
another detail – e.g. need to decolourise ; [up to 3]
- (d) drawing marks: [D.3]
- 1 complete section, at least 7 cm deep, clear and realistic
  - 2 upper cuticle with correct ratio palisade to spongy tissue
  - 3 stoma shown – 2 guard cells correct
- labels:  
2 from: stoma(ta), guard cell, epidermis, cuticle ; [1]  
2 from: palisade, spongy, mesophyll ; [1]
- [Total: 19]**