

## MARK SCHEME for the October/November 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) Graph marks:  
 1. x-axis labelled 'light intensity/arbitrary units'.  
 2. y-axis labelled 'number' or 'rate'/bubbles per minute'.  
 3. accurate and clear plotting.  
 4. curve (line) of – best fit/*ruled* connections.  
 Rev. axes: A: both axis labels = 1 mark ; and point 4 ;  
 Bar graph: A: 1 and 2. [4]
- (ii) light saturation AW ;  
 CO<sub>2</sub>/other factor limiting/ref 1 variable ; [2]
- (b) (i) light source generates heat ;  
 affects rate of: reaction/photosyn./enzyme action [R: denatures]; [2]
- (ii) time to settle/acclimatise ; [1]
- (iii) move lamp/apparatus closer ;  
 use brighter/higher power bulb/more bulbs ; [2]
- (iv) Four from: replicate readings/take mean ;  
 method of having uniform bubbles ;  
 maintain constant temp/w.bath etc. ;  
 collecting / measuring gas ;  
 more weed / longer time ; [ignore CO<sub>2</sub>/HCO<sub>3</sub>] [up to 3]
- [Total: 14]**
- 2 (a) (i) Drawing marks: [D.3]  
 1. Realistically complete, at least 8 cm,  
 clear and clean.  
 2. Spores well shown with smaller proximal bulge.  
 3. 4–5 spores on main branches.
- (ii) Measurement *with correct units* from place indicated ;  
 NB – *if in cm must give decimal place e.g. 4.0 cm.*  
 Expression clear and correct ;  
 [drawing measurement over equivalent on Fig.]  
 Mag. accurate and well expressed ;  
 [Up to 2 d.p, no more than 0.2 rounding]  
 Allowance for x 1000 ; [4]
- (b) Holes, smears or filter paper discs on culture dishes;  
 [or a group of separate dishes]  
 dilutions mentioned ; R: volumes  
 clear areas measured/observed ;  
 how results assessed ;  
 replication ;  
 control qualified ;  
 constant environment/temp/volume/time ; [up to 4]
- [Total: 11]**

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3 (a) (i)

Table 3.1

time/min	solution in Visking tube		solution in beaker	
	starch test	reducing sugar test	starch test	reducing sugar test
0	(blue) – black	blue	brown (etc.)	blue
2	less dark	blue – green	brown	blue – green
4	paler blue-(black)	green	brown	blue – green –etc
10	brown (etc.)	yellow – orange etc.	brown	yellow/green/ orange etc.

[1 for each of 4 columns = 4 , + all 16 spaces completed = 1] ; ; ; ; ; [5]

(ii) no further change/stays yellow/–ve for starch ; [1]

(iii) Two from: visking = gut wall (or named region) for absorption ;  
contents represent digestion ;  
surrounding water = blood system etc. ; [up to 2]

(b) (i) Level/meniscus rises in glass tube ; [1]

(ii) osmosis ;  
explained ref. water potential ;  
movement of water ;  
correct pressure ref. ; [up to 3]

(c) smaller molecules R: particles etc. pass through ;  
water always goes through ;  
so does glucose/maltose/reducing sugar ;  
not sucrose/starch ; [up to 3]

**[Total: 15]**