

## MARK SCHEME for the October/November 2007 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) (i) 1 At least 5 cm, clear and realistic [D.3]  
2 Grain shown + root(s)  
3 Coleoptile/cotyledon observed.
- Labels: seed/grain/testa ;  
one from root/radicle/coleoptile/cotyledon [2]
- (ii) Both measurements, (both with 1d.p. if cm.) units once ;  
*R: if no indication where measured*  
Expression and calculation ;  
Mag. Well expressed ; [up to 2 d.p. and 0.2 rounding] [3]
- (b) (i) test for starch: brown or other result ;  
Test for r/s: blue/no colour change ; [2]
- (ii) add Benedict's ;  
equal amount etc. ;  
Heat – w.bath stated or implied ; [3]
- (c) test for starch: brown etc. ;  
test for r/s: green/yellow/orange/brown qualified ; [2]  
*A: up to 1 each for conclusions in these 3 sections of (b) and (c).*
- (d) enzyme in seed/diastase ;  
changes/digests starch ;  
to (reducing) sugar/maltose/glucose ;  
which diffuses out/through membrane/revealed in test ; [up to 3]  
*Ignore ref osmosis*
- (e) grow seedlings of maize and rice ;  
method of preparation (e.g. chop) ;  
tests as before ;  
same temp. ;  
equal amounts of reagents/material ;  
equal amount of starch ;  
same time scale ; OVP; [up to 4]
- [Total: 22]

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- 2 (a) (i) two measurements both with units ; [*1<sup>st</sup> d.p if cm*]  
 working including division by 2 ;  
 answer correct in cm<sup>2</sup> (mm<sup>2</sup>) ; [3]
- (ii) Neatly traced outline ;  
 obvious tally system used ;  
 allowance for incomplete squares ;  
 realistic result clearly recorded, with units ; [4]
- (iii) Advantage: speed ; *R. easy/simple*  
 fieldwork ;  
 only ruler needed ; OVP ; [up to 1]  
 Disadvantage: degree of inaccuracy ;  
 shape of leaf ; OVP ; [up to 1]
- (b) (i) thickness/height ; [1]
- (ii) short diffusion pathway ;  
 for CO<sub>2</sub> especially ;  
 light catching ;  
 for p/s (energy) ; [up to 2]
- (c) (i) green ;  
 flat ;  
 veined ;  
 large s/a ; [up to 3]
- (ii) W1 W2  
 dicot. v monocot ;  
 net veined v parallel veins ;  
 leaf stalk v sessile ;  
 leaf only v node present ;  
 two sides differ v both sides alike ;  
 broad v narrow ;  
 jagged v smooth ;  
 stated colour difference ;  
 stated difference in hair distribution ; [up to 3]

[Total : 18]