

## MARK SCHEME for the October/November 2006 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 students, 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.

The grade thresholds for various grades are published in the report on the examination for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the October/November 2006 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.



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- 1 (a) (i)** A & B correct on Fig. 1.1 - anther & ovule clearly indicated ; [1]
- (ii)** A & B correct on Fig. 1.2 - anther & ovule clearly indicated ; [1]
- (iii)** A & B correctly related:  
 anther / stamen / andrecium ; pollen (production) / male gametes ;  
 carpel / ovule / ovary / gynecium / pistil ;  
 ovule / female gamete / embryo sac formation AW ; [4]  
 R: ovum / ova / egg  
 A: second part alone if first is not nonsense, or if first is blank.  
 A: ovule etc. once only
- (iv)** Look for related contrasting statements.
- |                                  |                               |           |
|----------------------------------|-------------------------------|-----------|
| Fig. 1.1                         | Fig. 1.2                      |           |
| large flower / petals            | smaller / none ;              |           |
| petals & sepals                  | no perianth AW ;              |           |
| 2 (visible) / fewer stamens      | 3 / more stamens ;            |           |
| stamens enclosed / non-pendulous | pendulous / stamens outside ; |           |
| long(er) filaments               | shorter filaments ;           |           |
| single stigma                    | two stigmas ;                 |           |
| forked / non-feathery stigma     | feathery stigma ; R: sticky   |           |
|                                  | OVP e.g. nectary ;            | [up to 3] |
- (b) (i)** By insects / bees ; R: animals [1]
- (ii)** (They are attracted by) (large) qualified petals ;  
 stamens & stigmas situated to give & receive pollen from insect AW ;  
 AVP e.g. suitable ref. pollen grains ; [up to 2]
- (iii)** scent ; colour ; nectar ; guide lines ; [up to 2]
- (c)** Protandry ; protogyny ; single sex flower ;  
 AW e.g. organ removed. Ref. position of parts of flower ; [1]
- [Total: 15]**

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- 2 (a) (i) Ref. thin section with only the one hair / ref. magnification ; [1]  
(ii) Lubricates / oils / makes supple / waterproofs hair / fur / antiseptic ; [1]  
(iii) Line 'H' clearly to part of follicle ; [1]  
(iv) Line 'M' to muscle on right of hair shaft. ; [1]
- (b) (i) Coils of tube cut across AW ; [1]  
(ii) mitosis ; [1]
- (c) (i) measure equal volumes of hot water into both cups ;  
record temperature ;  
ref. lids ;  
regular intervals / every 2 (-5) min ;  
plot results on graph ;  
AVP e.g. digital / computer link etc. ;  
[**MAX 2** for 1 beaker only] [up to 3]
- (ii) use 2 thermometers / 2 expts etc. ;  
better timing ;  
replication / repeats ;  
use stirrer ;  
AVP ; [up to 2]  
R: ref. control

[**Total: 11**]

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- 3 (a)** Graph marks: [4]
1. x axis labelled, with units 'time / h(ours)' ;
  2. y axis labelled, with units 'CO<sub>2</sub> conc. / a.u.' ;
  3. accurate plotting – through points
  4. ruled connecting lines / smooth curve thro' points
- Reversed axes: A: points 3 & 4 only  
 Bar graph: A: points 1 & 2 only
- (b) (i)** Carbon dioxide (used up) ;  
 in photosynthesis ;  
 during (day)light period ; [up to 2]  
 If ref. respiration = 0 for section (b)(i)
- (ii)** in no / poor light / night ;  
 respiration ;  
 exceeded photosynthesis ; [up to 2]
- (c)** starch:\*
- leaf in boiling / hot water ; R: boiled water  
 (decolourise) in ethanol ;  
 (dip / soften) in water ; [up to 2]  
 add iodine (solution) ; [1]
- reducing sugar:\*
- grind / crush / scrape leaf – form solution ;  
 add Benedict's ; A: Fehlings R: copper sulphate  
 [If non-reducing test started do not award Benedict's mark]  
 heat in water-bath ; [up to 3]
- \*2 max if starch / R.S. added
- [Total: 14]**