

**MARK SCHEME for the October/November 2009 question paper
for the guidance of teachers**

0654 CO-ORDINATED SCIENCES

0654/05

Paper 5 (Practical Test), maximum raw mark 45

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- 1 (a) good quality of drawings ;
chlorophyll label ; [2]
- (c) leaf **B** and **C** same shape as in part (a) ;
leaf **A** only one containing starch, correctly labelled ;
ignore small traces of starch in **B** and **C**
pattern of starch matches chlorophyll pattern in (a) ; [3]
- (d) (leaf **A** starch present)
light and carbon dioxide both needed (for photosynthesis) ;
starch only found where chlorophyll is ;
- leaf **B**
no photosynthesis because carbon dioxide is absent ;
do not allow if stated that water also absent
- leaf **C**
no photosynthesis because light is absent ; [4]
- (e) to remove carbon dioxide ; OWTTE [1]
- (f) (i) to soften the cuticle / kill leaf / allow entry of ethanol ; [1]
- (ii) as a control ; [1]
- (g) destarch the plant ;
put lightproof paper over leaf ;
leave for 24 hours in light ;
do starch test ; [3 max]

[Total: 15]

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- 2 (a) recording the refractive index ; [1]
- (d) 5 suitable drawings ;;
Give ONE mark if only 4 (2)
- Table
angles of i are about 60° , 55° , 40° , 30° and 20° and r values ;;
ONE mark if only 4 values (2)
- angles of r decrease appropriately ; (1) [5]
- (e) Graph
scale ;
plotting ;
suitable curve ; [3]
- (f) correctly read from graph ; [1]
- (g) both sines correct, estimating if necessary ;;
if clearly not from the table provided do not allow ratio correctly calculated [2]
- (h) suitable comment ; looking for some idea of accuracy of experiment [1]
- (i) if the refractive index is greater, then angles of refraction would be smaller ; or vice versa
the denser the medium, the greater the ray is bent ; [2]

[Total: 15]

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- 3 (a)** accept anything between 0.03 and 0.08 ; [1]
- (c)** results for all three ;
value for **B** is half **A** within 2 drops ;
value for **C** is half **B** within 2 drops ;
value for **C** within 2 drops of SV ;
- if **A** is larger than 20, 2 drops becomes 3 drops [4]
- (d)** most concentrated is **A** ;
needs the largest number of drops ; [2]
- (e)** brown ppt. ; [1]
- (f) (i)** white ppt. ; [1]
- (ii)** dirty white, grey or cloudy (ppt. not necessary here as reaction is slow) ; [1]
- (iii)** green ppt. ; [1]
- (g)** one mark for iron(II) and one for sulfate ;; [2]
- (h)** count drops into a measuring cylinder to suitable volume (at least 5 cm³) ;
divide by number of drops ; [2]

[Total: 15]