MARK SCHEME for the October/November 2015 series

5054 PHYSICS

5054/41 Paper 4 (Alternative to Practical), maximum raw mark 30

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, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

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1 (a) N pole  

(b) (i) simple means of suspension  
good practical detail, e.g. string stirrup/at the centre stated  
(ii) means of floating magnet, e.g. place on block of  
wood/polystyrene/foam/object that floats/on a float

(c) statement + explanation, e.g. water due to (more) friction/resistance

[Total: 5]

2 (a) (i) remove excess water/water that has not been absorbed/owtte/shake off the  
drops/no drips (on bench)/avoid spillage/remove surface water/to do the  
same each time

(ii) whole towel would absorb all the water  
to obtain different values for different volumes/to get a large range of  
values/to get more results owtte

(iii) Any one:  
takes too long to cut squares/do experiment  
only small amount of water removed each time/do not absorb enough water

(b) (i) axes correct way round, labelled quantity and unit  
scales linear, sensible  
points plotted accurately within ½ small square  
neat crosses or small points (in circle)  
best fit straight line drawn

(ii) 0.49 ± 0.02 at least 2 sf ignore unit

(iii) furthest point from line/anomalous point/  
does not fit on line/does not fit the pattern

(iv) 32 ± 0.5 cm³ unit required

(c) white towels + explanation, e.g.  
more squares needed for yellow towels ORA/steeper gradient means more  
towels needed per unit volume

(d) statement + explanation  
B to make a fair comparison/experiment/result of the material/to keep the same  
conditions/number does not matter – it is the absorbency that does matter

[Total: 12]
### Question 3

(a) (i) ray from A to screen through pinhole  
ray from B to screen through pinhole  
17 ± 2°

(ii) use of longer lines, e.g. use of rays on left hand side of pinhole / extend rays on right / measure the angle from both rays / measure angle at both sides of the intersection

(iii) ray from A forms bottom of image ora with B / image is real / rays of light cross or intersect / rays of light meet at the pinhole (before the screen)

(b) light from A spread out / diverge on screen / form more than one image / rays from A do not meet (at a point on screen)

[Total: 6]

### Question 4

(a) (i) two values accurately marked and labelled  
all three accurately marked and labelled

(ii) 46 mm cao  
48 mm cao  
2 mm cao  
two correct with at least one unit  
all three correct with units

(iii) Answers in range 17 100 to 17 250 min 2 sf  
17 000 mm³ / 17 cm³

(b) vernier / micrometer / calipers / depth gauge  
ruler (with no dead space) both needed

[Total: 7]