CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

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 B1

(b) **(i)** simple means of suspension B1
good practical detail, e.g. string stirrup / at the centre stated B1

(ii) means of floating magnet, e.g. place on block of wood / polystyrene / foam / object that floats / on a float B1

(c) statement + explanation, e.g. water due to (more) friction / resistance B1

[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 B1

(ii) whole towel would absorb all the water B1
to obtain different values for different volumes / to get a large range of values / to get more results owtte

(iii) Any one: B1
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 B1
scales linear, sensible B1
points plotted accurately within ½ small square B1
neat crosses or small points (in circle)
best fit straight line drawn B1

(ii) 0.49 ± 0.02 at least 2 sf ignore unit B1

(iii) furthest point from line / anomalous point / does not fit on line / does not fit the pattern B1

(iv) $32 \pm 0.5\,cm^3$ unit required B1

(c) white towels + explanation, e.g. B1
more squares needed for yellow towels ORA / steeper gradient means more towels needed per unit volume

(d) statement + explanation B1
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]

3 **(a)** **(i)** ray from A to screen through pinhole B1
ray from B to screen through pinhole B1
17 ± 2° B1

(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 inter section B1

(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) B1

(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) B1

[Total: 6]

4 **(a)** **(i)** two values accurately marked and labelled C1
all three accurately marked and labelled A1

(ii) 46 mm cao
48 mm cao
2 mm cao
two correct with at least one unit C1
all three correct with units A1

(iii) Answers in range 17 100 to 17 250 min 2 sf C1
17 000 mm^3 / 17 cm^3 A1

(b) vernier / micrometer / calipers / depth gauge
ruler (with no dead space) **both needed** B1

[Total: 7]