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Cambridge Ordinary Level

MARK SCHEME for the October/November 2015 series

5054 PHYSICS

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

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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]

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3 **(a)** **(i)** ray from A to screen through pinhole B1
ray from B to screen through pinhole B1
$17 \pm 2°$ 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]

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