

MARK SCHEME for the October/November 2008 question paper

0652 PHYSICAL SCIENCE

0652/06

Paper 6 (Alternative to Practical), maximum raw mark 60

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- 1 (a) (i) **squeeze** (the teat) and **release** with the **tube in liquid: all points essential**
- (ii) fill the pipette **several times** and place in the measuring cylinder (1)
 read and divide by the number pipettes-full (1)
 (one mark only for placing one pipette-full into the cylinder) [2]
- (iii) count drops delivered and divide into pipette volume (1.8 cm³) [1]
- (b) (i) red – blue (must be in correct order) [1]
- (ii) 16 × 0.08 = 1.28 (accept 1.3) (cm³) [1]
- (iii) sodium hydroxide is more concentrated (1)
 as a smaller volume of it is needed OWTTE (1) [2]
- (iv) to wash out/rinse the pipette [1]
- (v) sodium chloride/NaCl [1]

[Total: 10]

- 2 (a) (i) 15.0, 17.0 (no tolerance)
 (if 1st decimal place is missing, maximum 1 mark) [2]
- (ii) 15/20 = 0.75, 17/20 = 0.85, (one or both correct) ecf
 (answer must show 2 d.p.) [1]
- (iii) 0.75² = 0.56, 0.85² = 0.72 (one or both correct) ecf
 (at least one answer must show 2 d.p.) [1]
- (b) 3 or 4 points correctly shown; vertical tolerance 0.01 (half small square) (ecf) (1)
 horizontal; no tolerance
 straight line drawn, not passing through 0,0. (1) [2]
- (c) **any** x- and y- distances marked or triangle drawn on graph
 from which gradient may be calculated (1)
 gradient calculated as y/x, (ecf)
 example:

$$\frac{0.90 - 0.42}{(500 - 200)} = \frac{0.47}{300}$$
 (working must be shown) = 1.56 × 10⁻³ (accept 1 d.p.) (1) [2]
- (d) $\frac{75 \times 0.0002}{1.56 \times 10^{-3}} = 9.57$ (accept 1 d.p., working need not be shown) (ecf) [1]
- (e) the spring and weight hanger have a mass/
 the spring will oscillate even if no weights are added OWTTE [1]

[Total: 10]

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- 3 (a) (i) aqueous (dissolved in water)
- (ii) solid
- (b) less than 50 cm³ [1]
- (c) two folds at rt-angles OWTTE (1)
 open out (to form a cone) OWTTE (1)
 accept answers given as diagrams (no mark if filter paper is cut) [2]
- (d) pour (distilled) water through the precipitate (to wash it) OWTTE [1]
- (e) add (a few drops of) potassium carbonate to see if there is a precipitate (1)
 EITHER if there is, not enough has been added (1)
 OR if there is no precipitate, enough has been added (or 1) [2]
- (f) (partly) evaporate the solution (by heating) (1)
 leave to crystallise (without heating) OWTTE (1)
 (one mark only for "evaporate to dryness") [2]

[Total: 10]

- 4 (a) 2.8 A, (1)
 11.5 V (+/- 0.1) (1) [2]
- (b) 34.5, (1)
 41.5, (1)
 48.5 (+/- 0.1) (1) [3]
- (c) $2.8 \times 11.5 \times 5 \times 60$ (ecf) (1)
 = 9660 J (working need not be shown) (1) [2]
- (d) (i) $\frac{9660}{50 \times (55.8 - 20)}$ (1)
 = 5.4 J g⁻¹ °C⁻¹ (ecf) (1) [2]
- (ii) heat or energy loss (from the water) / mass of water incorrectly measured/
 timing was incorrect (any 1) [1]

[Total: 10]

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- 5 (a) (i) 12 mm, (1)
67 mm, (1)
64 mm (+/- 1 mm) (1)
(if recorded as centimetres, e.g. 1.2, 6.7, 6.4 deduct 1 mark)
- (ii) so that they all have the same temperature (rise) OWTTE
REJECT: to make it a fair test/so that conditions are equal [1]
- (iii) so that all the water is at the same temperature/
all tubes are equally heated OWTTE [1]
- (b) the result will be too large (1)
because the air expands more than the liquid (1) [2]
- (c) (i) less than (1)
explanation: because the glass particles have stronger forces between them/
otherwise level of liquid would drop/reference to results (1) [2]
- (ii) attraction within water is greater than in ethanol
OR attraction in ethanol is less than in water OWTTE [1]

[Total: 10]

- 6 (a) (i) observation: white (1)
conclusion: sulphate / SO_4^{2-} (1) [2]
- (ii) observation: magnesium dissolves/bubbling/effervescence/
fizzing/colourless solution formed (any 1) (1)
(reject "gas is given off")
observation: hydrogen burns, "pop" OWTTE (1) [2]
- (iii) observation: 1: flame extinguished/goes out/dies (1)
observation: 2: turns cloudy/milky/chalky/white precipitate (1) [2]
- (b) (i) observation: brown (precipitate) [1]
- (ii) test: silver nitrate/ $AgNO_3$ (1)
observation: white (precipitate) (1) [2]
- (c) observation: green/greeny-blue [1]

[Total: 10]