UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level

| **PHYSICAL SCIENCE**	**8780/02**
Paper 2 Short Response	**For Examination from 2011**
SPECIMEN MARK SCHEME	
	40 minutes

MAXIMUM MARK: 30

This document consists of **3** printed pages and **1** blank page.

1 **(a)** micrometer (screw gauge)/travelling microscope [1]

  (b) either ohm-meter or voltmeter and ammeter
     or multimeter/avo on ohm setting [1]

  (c) either (calibrated) c.r.o. or a.c. voltmeter and × √2 [1]

2 kg m s^{-2} [1]

3 **(a)**
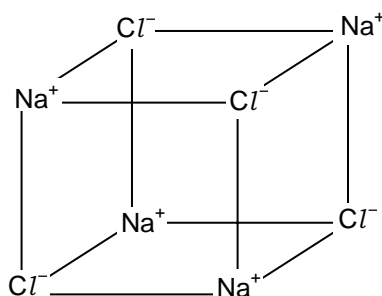
  ionic bonding [1]
  correct ions and shape [1]

  (b) molten NaC*l* has mobile ions which conduct; in solid NaC*l* the ions are fixed in place [1]

4 **(a)** C_6H_{10} [1]

  (b) % carbon = (82/72) × 100 = 87.8 % [1]

5 (air) resistance increases with speed [1]
  resultant/accelerating force decreases [1]

6 **(a)** 90° [1]

  (b) 130 = F × 0.45 (allow e.c.f. for angle in **(i)**) [1]
     F = 290 N [1]
     (allow 1 mark only if angle stated in **(i)** is not used in **(ii)**)

7 **(a)** elimination [1]

  (b) **(i)** $CH_2=CHCH_2CH_3$ [1]

     (ii) $CH_2=C(CH_3)_2$ [1]

8   the (only) intermolecular force present is van der Waals' forces   [1]
       vdW increase with increase in number of electrons in S8 compared to Cl2.

9   when a wave (front) is incident on an edge/obstacle/slit/gap   [1]
       wave 'bends' into the geometrical shadow/changes direction/spreads   [1]

10 (a) most α-particles deviated through small angles (accept 'undeviated')   [1]
           few α-particles deviated through angles greater than 90°/large angles   [1]

   (b) (i) allow 10^{-9} m → 10^{-11} m   [1]

   (ii) allow 10^{-13} m → 10^{-15} m   [1]

   (if **(i)** and **(ii)** out of range but **(ii)** = **(i)** $\times 10^{-4}$ or 10^{-5} then allow 1 mark)
   (if no units or wrong units but **(ii)** = **(i)** $\times 10^{-4}$ or 10^{-5} then allow 1 mark)

11 add aqueous silver nitrate followed by concentrated aqueous ammonia   [1]
       allow addition of aqueous chlorine
       off-white ppt formed which dissolves in conc ammonia   [1]
       allow red/orange colour with aqueous chlorine
       observations tied to correct reagents

12 (a) rate = the gradient of the tangent at **A**   [1]

   (b) graph starts at 0,0 and rises <u>more steeply</u> than original   [1]
           graph levels off at <u>about ½</u> the volume of the original   [1]

4

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