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.

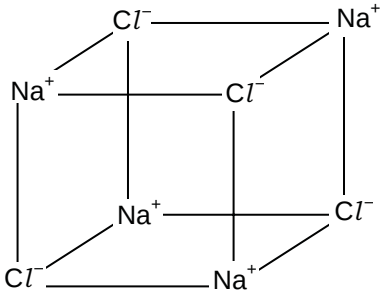
1 **(a)** micrometer (screw gauge)/travelling microscope [1]

(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 × $\sqrt{2}$ [1]

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

3 **(a)**



ionic bonding [1]
correct ions and shape [1]

(b) molten NaCl has mobile ions which conduct; in solid NaCl 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 Cl_2. [1]

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)** × 10^{-4} or 10^{-5} then allow 1 mark)
(if no units or wrong units but **(ii)** = **(i)** × 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 more steeply than original [1]
graph levels off at about ½ the volume of the original [1]

BLANK PAGE