NANYANG GIRLS' HIGH SCHOOL
Sec 3 Physics Practical

18

Marking Scheme for P01 Measurement of Length

1.   Half-metre rule: About 1.6 cm

Diameter d recorded to zero d.p in mm / 1 d.p in cm / 3 d.p in m with correct unit.   [1]

2.   Vernier Calipers   About 1.60 cm

Zero error recorded with + / - sign and correct unit.   [1]
Table of **d**
. All readings and average consistently tabulated to 2 d.p in cm.   [1]
. Final readings of **d** shown corrected for zero error.   [1]
. Values are accurate.   [1]

3.   Micrometer Screw Gauge   About 1.640 cm

Zero error recorded with + / - sign and correct unit.   [1]
Table of **d**
. All readings tabulated to 2 d.p in mm.   [1]
. Final readings of **d** shown corrected for zero error.   [1]
. Values are accurate.   [1]

Note: Deduct 1 mark if the readings for the micrometers defer those for the Vernier calipers by more than 0.03 cm

4.   Tabulation of data (object A: a white acrylic block)

- 2.0 cm x 1.5 cm x 0.6 cm
- OR 2.2 cm x 1.3 cm x 0.8 cm
. Values recorded to correct d.p.   [1]
. Values of **V** recorded to the correct number of s.f.   E.g. 3 (should be minimum 2 sf), 2.1 and 2.13   [1]
. Values calculated are accurate.   [1]

Questions :

1 The one calculated with measurements made by the micrometer screw gauge is more precise   [1]
It has the more s.f. OR it has the less measurement uncertainty in its value.   [1]

2 Object may not be of uniform length / breadth / height   [1]
hence the measured values may not reflect the average value   [1]
OR
There may be human judgment error in estimating the length of the object, as the markings on the ruler are visually large,
thus the measured values for *l*, b and h would all have some error

3 Take more readings (at different points along each side) and calculate the average.   [1]