MEASUREMENTS II

1. A

2. C

3. C
4. B
5. (a) reading on scale not zero when closed / no object B1 [1]
(b) 28 seen or implied C1
1.28 seen / 8 seen C1
0.16 cao unit not required (0.427 scores 2) A1 [3]
(c) easier to use (e.g. no vernier to read/automatic reading) / reduces
operator error / quicker to use / more sf or dp or precise B1 [1]
uses a battery / cell / battery / cell may run out / expensive / too sensitive /
readings fluctuate / (circuit) malfunction B1 [1]
[Total: 6]

6. (i) Least count of the Vernier

$$= \frac{\text{Value of one main scale division}}{\text{Number of divisions on vernier scale}} \quad \text{[1m]}$$

$$= \frac{1mm}{10}$$

$$= \frac{0.1\ cm}{10}$$

$$= 0.01\ cm\ \text{[1m]}$$

(ii) Reading of the instrument = Main scale reading

+ (coinciding v.s. div x least count) [1m]

= 4.3 + (8 x 0.01)

= 4.3 + 0.08

= 4.38 cm [1m]

[Total 4m]

7. Zero error = 14 x 0.01 = 0.14mm [1m]
Diagram 1 = 2.50 + 0.09 = 2.59mm [1m]

Correct diameter = 2.59 - 0.14 = 2.45mm [1m]

8. (i) The wire whose thickness is to be determined is placed between the anvil and spindle end, [1m] the thimble is rotated till the wire is firmly held between the anvil and the spindle [1m]. The rachet is provided to avoid excessive pressure on the wire [1m]. It prevents the spindle from further movement.

(ii) Least count of an instrument is the smallest reading [1m] that you can measure accurately [1m] with that instrument.

(iii) Reading = Linear scale reading + (Coinciding circular scale x Least count)

= 2.5 mm + (46 x 0.01) [1m]

= (2.5 + 0.46) mm

= 2.96 mm [1m]

[Total 7m]