MARK SCHEME for the October/November 2013 series

0625 PHYSICS

0625/51   Paper 5 (Practical), maximum raw mark 40

1 **(a)** **(i)** l_0, recorded in mm [1]

     (ii) workable length clearly shown on Fig. 1.1 (or Fig. 1.2) [1]

  (iv), (v) table:
      correct F values used and increasing l values ($>l_0$) [1]
      e values correct [1]

  (b) graph:
     axes correctly labelled [1]
     suitable scales [1]
     all plots correct to ½ small square [1]
     good line judgement AND thin, continuous line [1]

  (c) triangle method used and shown [1]
     using at least half of candidate's line [1]

                                                              [Total: 10]

2 **(a)** **(i)** sensible value for θ_H [1]

  (a)–(d) table:
      s, ^{o}C, ^{o}C [1]
      correct t values 30, 60, 90, 120, 150, 180 [1]
      temperatures decreasing [1]
      evidence of temperatures to precision of at least 1°C [1]
      position B, greater decrease in temperature [1]

  (c) sensible new value for θ_H (lower than first value) [1]

  (e) one from:
     viewing thermometer at right angles
     reference to being ready on time [1]

  (f) any two from:
     room temperature
     starting temperature
     distance of thermometer bulb from water surface
     orientation of thermometer
     draughts [2]

                                                              [Total: 10]

3 **(a)** all V to at least 1 d.p. and $< 3\,V$ [1]
   I to at least 2 d.p. and $< 1\,A$ [1]
   V in V and I in A (at least once, not contradicted) [1]
   P in W (at least once, not contradicted) [1]
   P values correct [1]
   $P_T = P_1 + P_2 + P_3 \pm 10\%$ [1]

(b) statement matches results (expect YES) and justification in terms of within or beyond limits of experimental accuracy o.w.t.t.e [1]

(c) **(i)** diagram:
   lamps in parallel and variable resistor in series with power supply, correct symbols for variable resistor, lamps, voltmeter [1]
   <u>one</u> voltmeter, correctly positioned [1]

   (ii) vary current (or p.d.) [1]

[Total: 10]

4 **(a)** **(i)** $v = 28 – 32$ (cm) [1]

   (ii) (iii) calculations correct [1]

   (iv) f correct [1]

(b) $v = 22 – 26$ (cm) [1]
   f values within 4 cm of each other [1]

(c) **(i)** Sensible range up to 2 cm around a value approximately 24 cm [1]

   (ii) f_{AV} given to 2 or 3 significant figures and correct unit [1]
   $f_{AV} = 13 – 17$ cm [1]

   (iii) any two from:
   use of darkened room / brighter lamp
   mark position of centre of lens on holder
   place metre rule on bench (or clamp in position)
   ensure object and lens are same height from the bench
   lens / object / screen perpendicular to bench
   use of repeats [2]

[Total: 10]