2010 PRACTICAL PAPER 3

ANSWERS TO PRACTICAL QUESTIONS

1. (a) ho = 85.0–99.0mm Atleast 1 d.p(must) 1mk

(d)

L(mm)	900	800	700	600	500	
h(mm)	76.0-90.0	78.0-92.0	80.0-94.0	83.0-97.0	85.0-99.0	1dp 1mk for max 4 values
d(mm)				Exact subtraction		>4 values 1mk < 4-0
log L	2.95	2.90	2.84 or5	2.77 or8	2.69 or70	3sf.< 4 values 1mk < 4-0
log d	Candidates own values					> 4 values 1mk < 4 - 0

(c) Graph, Axes with no units 1mk
Scale (simple and uniform) 1mk
Plotting within 1 small square 2mks @ ½ for max. 4 values
Line: Drawn with ruler
: +ve gradient
:Through at least 3 correctly plotted points } 1mk

(f) (i) At least one point correctly plotted on the graph.
Correct intervals 1mk correct evaluation (2dp) 1mk.
Accuracy 0.13 – 0.53 1mk.

(ii) Correct substitution ½ mk. Correct evaluation 2dp ½ mk.

(iii) Extrapolation of candidates line ½ mk
(Accept continuous or broken line)
Correct reading when log d = 0 ½ mk.
(Ignore units if given)
Accuracy 2.5 – 2.7 1d.p 1mk

Or Forming of two equations ½ mk
Solving for C = G ½ mk
Accuracy 2.5 – 2.7 1mk

(iv) Correct substitution ½ mk } 2dp a must
Correct evaluation ½ mk }
(To the nearest whole number or to 1dp in std. form)

2. (a) d_1 = 4.18 – 5.18cm ½ mk 2dp a must
d_2 = 4.58 – 5.58cm ½ mk
X = $\frac{d_2 - d_1}{2}$ candidate's substitution ½ mk
Correct evaluation 2sf ½ mk

(b) h = 3.8 – 5.4cm 1dp must 1mk
A = $\Pi d_1 h$ substitution ½ mk
Evaluation 1dp (in the range 60 – 72) ½ mk

(e) Temperatures above 80° are not acceptable.

T(s)	0	20	40	60	80	100	120	140	160	180	
T_1°C	70-80	69-79	67-77	64-74	62-72	61-71	60-70	59-69	58-68	57-67	½ mk for max of 6 values
T_2°C	32-42	36-46	40-50	44-54	47-57	49-59	50-60	51-61	52-62	53-63	½ mk for max. of 6 values

Accept repeated values of T_1 and T_2 as from 140sec to 180sec.

(f) Graphs temperatures above 80°C are not acceptable.
Axes with units or units only 1mk
Scale: simple and uniform 1mk
Plotting: at least 4 points 2mks
Curve 1mk smooth drawn with free hand through at least 4 correctly plotted points in the expected trend.
Accept repeated values for plotting as from 140sec also as part of curve.

(g) (i) Whatever the trend;
Tangent drawn at t = 60sec 1mk

Correct intervals 1mk correct evaluation 2sf 1mk

(ii) Correct substitution 1mk
(Accept mixed units at the substitution stage only)
Correct evaluation 3sf in the expected or SI unit 1mk.
For wrong T_2 check from the graph and accept it.