

PH3 Mark Scheme – May 2004

Notes: This marking scheme, whilst reasonably complete does not give **all** the responses, which were credited by the examiners. It is hoped that the scheme is self-explanatory, though it will need to be read alongside the question paper. The following clarifications may be of use:

Statements in brackets [] are exemplification, alternatives, indications of acceptable range of numerical answers (with \pm), **or** statements which, whilst desirable in an answer were not required on this occasion for full marks.

The numbers in parentheses () are the marks, usually 1, for each response.

By the nature of a practical examination, the data are the candidates own and every attempt is made not to penalise candidates unduly for poor results, especially in the sections involving their analysis. The various sections of the questions are independent. e.c.f. stands for *error carried forward*, and indicates that the results of previous (incorrect) calculation or poor measurement will be treated as correct for the current section, i.e. the mistake will only be penalised once. This does not extend to errors of principle, for example inappropriately drawing a best-fit line through the origin and subsequently stating that the intercept is zero.

Question	Answers / Explanatory notes	Marks available
1. (a) (i)	Units of v shown as m s^{-1} (1) Manipulation of $\text{m s}^{-2} \text{m}$ in $\sqrt{2gh}$ (1)	2
(ii)	Air resistance [accept the value of g is not accurate]	1
(iii)	Use of callipers (1) Reading taken to the nearest mm (1) (State that) repeat readings taken (1)	3
(b)	Table: Diameter readings all taken to the nearest mm / 0.5 mm (1) \bar{d} and d^2 correctly given to consistent s.f.'s (1) velocity calculated correctly to 2/3 s.f. (1)	3
(c)	Graph: Axes labelled including units (1) Suitable scale [at least $\frac{1}{2}$ paper; no factors of 3] (1) All points (including 0.10 m) plotted correctly (1) Line of best fit [N.B. can be a curve] (1)	4
(d)	Yes (e.c.f. from candidates own results) (1) Straight line graph (1) through the origin (1)	3
(e)	Correct result chosen – from the table (1) Correct calculation: $\frac{u_{\max} - u_{\min}}{2}$ - ignore units (1)	2
(f)	Any 2 \times 1 of: Release mechanism ✓; greater sample size ✓; greater range ✓; other suitable comment ✓.	2
		[20]