Experimental Competition

27 April 2010

2010 APhO
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Question Number 1

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Experimental Question 1
MARKING SCHEME

Exp. I-A

(1) Data table   0.8 Points

    0.4+0.4+0.0

(2) Plot + 2 values   1.2 Points

    Plot +0.4 (plot A-f, only +0.3),, f_R +0.4, Q +0.4,

                                                        Subtotal: 2.0 points

Exp. I-B

(1)   0.2 points

(2) (3) (4)   data table   1.2 Points

    +0.3 (not in the proper range or too few data (<5 data point), -0.2)

    +0.3

    +0.6

(5) Plot: f_R as a function of distance d 1.2 Points

    +0.4, data plot,

    +0.2, x-axis, unit,

    +0.2, y-axis, unit,

    +0.4, guiding line

(6) Plot: $\ln(\Delta f_R)$ as a function of d 1.0 Points

    +0.4, data plot,

    +0.2, x-axis, unit,

    +0.4, straight line,

                                                        Subtotal: 3.6 points

Exp. I-C

(1) Two values   0.2 Points

    +0.1, +0.1

(2) Table

    +0.6 for the table   1.4 Points

    +0.1 for each peak, y move 0.1 cm near the peak,

    +0.6, range covers 4 cm

(3) Plot + a value   1.2 Points

(4) Two values   1.6 Points

    (M_A, 0.07~0.17cm, M_B, 0.2~0.4 cm)

                                                        Subtotal: 4.4 points

                                                        Total: 10 points