



**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 1.4 Points

+0.6 for the table

+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**