

Country Code	Student Code

Answer Form

PART-A

1. Suggest and justify, by using equations, a method allowing to obtain $m \times l$. (2.0 points)

2. Experimentally determine the value of $m \times l$. (2.0 points)

$m \times l =$ _____ .

Country Code	Student Code

PART-B

1. Measure v for various values of h . Plot the data on a graph paper in a form that is suitable to find the value of m . Identify the slow rotation region and the fast rotation region on the graph. (4.0 points)

(On a separate graph paper)

2. Show from your measurements that $h = C v^2$ in the slow rotation region, and $h = A v^2 + B$ in the fast rotation region. (1.0 points)

(In the plot above)

3. Relate the coefficient C to the parameters of the MBB. (1.0 points)

Country Code	Student Code

4. Relate the coefficients A and B to the parameters of the MBB. (1.0 points)

Country Code	Student Code

5. Determine the value of m from your measurements and the results obtained in **PART-A**. (3.0 points)

$m =$ _____ .

Country Code	Student Code

PART-C

1. Measure the periods T_1 and T_2 of small oscillation shown in Figs. 3 (1) and (2) and write down their values, respectively. (1.0 points)

$T_1 =$ _____ .

$T_2 =$ _____ .

2. Explain, by using equations, why the angular frequencies ω_1 and ω_2 of small oscillation of the configurations are different. (1.0 points)

Country Code	Student Code

3. Evaluate Δl by eliminating I_0 from the previous results. (1.0 points)

$\Delta l =$ _____ .

Country Code	Student Code

4. Write down the value of the effective total spring constant k of the two-spring system. (2.0 points)

$k =$ _____ .

5. Obtain the respective values of k_1 and k_2 . Write down their values. (1.0 points)

$k_1 =$ _____ .

$k_2 =$ _____ .