**EXPERIMENT NO 3**

**Bifilar suspension**

**Title:** Bifillar suspension method

**Aim:** To determine the radius of gyration of rectangular bar by Bifillar suspension.

**Theory:** Bifillar suspension method is used to find Moment of Inertia of different objects practically. The experiment gives idea about theory behind the MI. Also to find C.G of components like connecting rod is studied in this experiment.

Explain the following points

1. Definition of Moment of Inertia:

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1. Derivation for bifilar suspension calculation.

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**Apparatus:**

Bifillar setup with nylon threads, stop watch, spirit evel, connecting rod, rectangular bar etc.

**Procedure:**

To find radius of gyration and ML of given rectangular bar.

1. Suspend the rectangular bar from hook. The suspension/length of each cord must be the same. Check it with spirit level.

2. Allow the bar to oscillate about the vertical axis passing through the C. G. of bar. Give small oscillations. Take care that bar will not twist during oscillations.

3. Measure the periodic time for 10 oscillations.

4. Repeat the experiment by mounting weights at equal distance from the center of bar. In this arrangement 06. remain same.

5. Complete the observation table. Calculate Km. and Km and compare.

**Observation Table:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sr no | Length of  suspension ‘L’ in m | Distance from  C.G ‘a’ in m | Time for oscillations ‘t’ in sec | Periodic time  T = t/10 in sec | Mean time T(exp) |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 4 |  |  |  |  |  |

**Calculations:**

1. K(expt) = T (exp) /2π

Where 2a = distance between 2 wires

K = radius of gyration of Bifilar suspension.

1. Kth = l/2
2. M.I. expt = m and M.I.th = m

**Results :**

a . Kexpt. for rectangular bar =

b. Kth for rectangular bar =

**Conclusion:**

