Moment and equilibrium - lab report example

Science, Physics

Moment and Equilibrium

Moment and Equilibrium Introduction An object is in balance when it has no trend to turn or change, that is no conversion and no spinning. When a figure is in equilibrium the anticlockwise moments round a point is equivalent and contradictory to the totality of the anticlockwise moments about that point and likewise the resulting force is zero (Lee, 2010). This is presented by the demonstrations chosen some loaded beams. Moment of force, therefore, is that force that is due to the revolving effect, for example when a force is subjected to one end of a body whose other end is attached to a pivot, that pulls or push will tend to revolve the object about the pivot thus that turning effect obtained is the moment of force.

Aim

The aim of the experiment is to verify the equilibrium of force on a beam experimentally and analytically using the concepts and equilibrium and finding the reactions of the left and right weights (Lee, 2010).

Apparatus

Stand, boss and clamp

Metre rule

Loop of thread

Mass hanger and some slotted masses

Method

The boss, stand and clamp is set so that the bar of the clamp is straight and its tallness above the seat is few centimetres further than the length of the mass hanger

The thread loop is attached over the zero mark of the metre rule

The mass is suspended from the lowest of the loop underneath the metre rule

The loop is slided to about 1cm mark of the metre rule

The metre rule is relocated and the suspended masses so that it equilibriums horizontally on the slab of the clamp stand

The experiment is repeated three times to get more results

Results

Discussion

From, 0= P1X1 +P2X2 + P3X3 – RBL, that is in case II

0= 20 x 18 + 15 x 51 + 10 x 78 – RB x 100

360 + 765 + 780 – 100Rc = 0

1905 = 100Rc

Rc = 19. 05

But RB + RA= P1 + P2 = P3

19. 05 + RA = 20 + 15 + 10

19. 05 + RA = 45

RA= 25. 95

CaseIII

0 = P1 X 1 + P2X2 + W + L/2 – Rc + L

0 = 20 x 0. 18 + 10 x0. 51 + 11. 14+ 1/2 – Rc + 1

RB= 3. 6+ 5. 1+ 11. 14+ 0. 5 + 1

RB = 21. 34

P1 + P2 +W = RA + RB

20 + 10 + 11. 14 = RA + 21. 34

RA = 19. 8

Sources of Errors

Random error

Taking measurements by several people would mechanically give dissimilar values since each individual may stretch the string by diverse tension. To minimize is by stipulating the circumstances that could lead to the error.

Environmental factors

Taking into consideration of errors presented by the instant working environment. There is a need to take into account or shield the experiment from shakings, drafts, variations in temperature, electronic sound or other effects from neighboring apparatus (Lee, 2010).

Parallax

This error can happen when there is some length or distance between the measuring balance and the indicator used to attain a measurement. If the viewer's eye is not directly aligned with the indicator and scale, the interpretation may be extraordinary (Lee, 2010).

Physical variations

It would be essential to take numerous measurements so as to be examined for accuracy.

Conclusion

The graph shows the relationship between the moments in equilibrium since the clockwise moments should be equal to the anti-clockwise moments.