Test - Moments

Year: Year 13 · Duration: 40 minutes · /20

Name:	Date:	**Mark: /20**

Question	1	2	3	4	5	Total
marks	4	4	4	4	4	**20**
Mark						

Show your working.

Question 1 (4 marks)

Question 1 – Moments of forces

A 25 N force acts at right angles to a rod at a point 0.6 m from a pivot O, turning it anticlockwise. A 40 N force acts at 35° to the rod, 0.5 m from O, turning it clockwise.

a. Find the moment of each force about O. [2 marks]
b. Find the net moment and its direction. [2 marks]

Question 2 (4 marks)

Question 2 – Beam on two supports

A uniform beam AB of length 6 m and mass 30 kg rests on supports at C and D, where $AC = 1$ m and $BD = 1$ m. A load of mass 20 kg is placed 0.5 m from A.

a. Find the reaction at C and the reaction at D. [4 marks]

Question 3 (4 marks)

Question 3 – Will the plank tilt?

A uniform plank of length 4 m and mass 16 kg rests on supports C and D placed 0.5 m from each end. A girl of mass 40 kg stands on the end A.

a. Find the reaction at D and deduce whether the plank tilts. [4 marks]

Question 4 (4 marks)

Question 4 – A hinged rod

A uniform rod of length 1.6 m and mass 5 kg is hinged at A to a wall and held horizontal by a light string from B to the wall, at 30° to the rod.

a. Find the tension in the string. [3 marks]

b. Find the vertical force exerted by the hinge. [1 mark]

Question 5 (4 marks)

Question 5 – Non-uniform rod

A non-uniform rod AB of length 3 m and mass 6 kg balances horizontally on a pivot placed 1.1 m from A when a 4 kg mass is hung from A.

a. Find the distance of the centre of mass from A. [3 marks]
b. Find the force exerted by the pivot. [1 mark]