

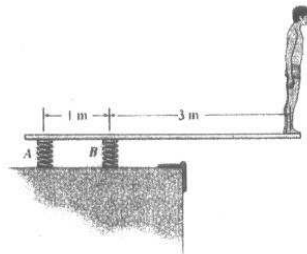
國立中正大學九十五學年度碩士班招生考試試題
系所別：光機電整合工程研究所

科目：應用力學

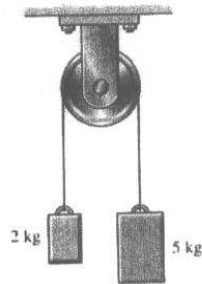
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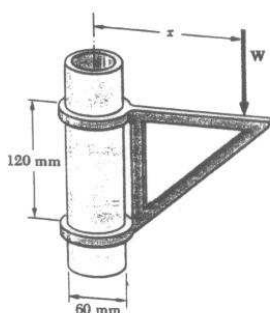
1. A boy stands out at the end of the diving board, which is supported by two spring A and B, each having a stiffness of $k = 15 \text{ kN/m}$. In the position shown the board is horizontal. If the boy has a mass of 40 kg , determine the angle of tilt which the board makes with the horizontal after he jumps off. Neglect the weight of the board and assume it is rigid. (25 %)



2. The two masses are released from rest. How fast are they moving after the 5 kg mass has fallen 0.2 m ? And what is the tension in the cable after the masses are released? (25 %)



3. The movable bracket placed on the 60-mm-diameter pipe. If the coefficient of the static friction between the pipe and bracket is 0.25, determine the minimum distance x at which the load W can be supported. Neglect the weight of the bracket. (25%)



4. The magnitude and direction of the velocities of two identical frictionless balls before they strike each other are $V_A = 30$ ft/s, $V_B = 40$ ft/s. Assuming the coefficient of the restitution $e = 0.90$, determine the magnitude and direction of the velocity of each ball after the impact. (25%)

