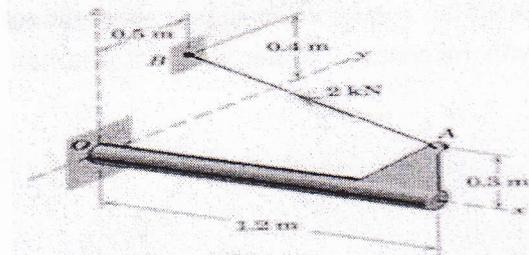
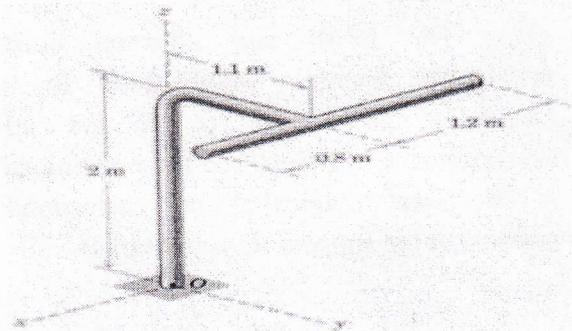


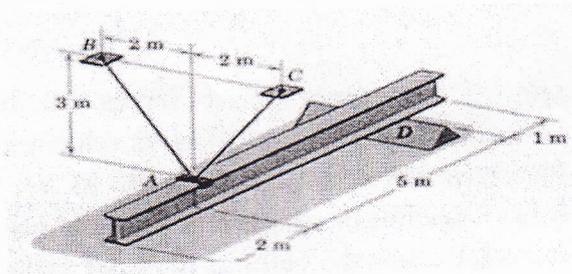
Q1:- The cable exerts a tension of 2kN on the fixed bracket at A. Write the vector expression for the tension T. (20 marks)



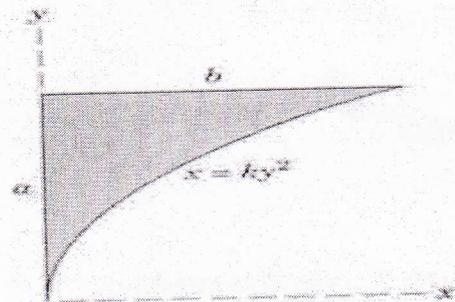
Q2:- The structure shown is constructed of circular rod which has a mass of 7Kg per meter of length. Determine the moment M_O about O caused by the weight of the structure. Find the magnitude of M_O . (20 marks)



Q3:- The uniform I-beam has a mass of 60 Kg per meter of its length. Determine the tension in the two supporting cables and the reaction at D. (20 marks)



Q4: (A):- Determine the coordinates of the centroid of the shaded area. (10 marks)

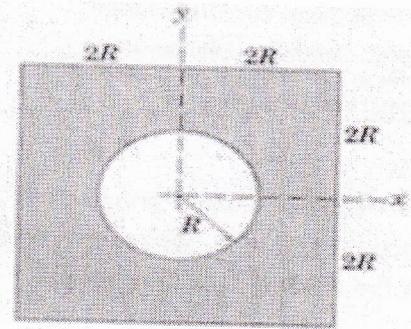


(B):- The acceleration of a particle is given by $a=4t-30$, where a is in meters per second squared and t is in seconds. Determine the velocity and displacement as functions of time. The initial displacement at $t=0$ is

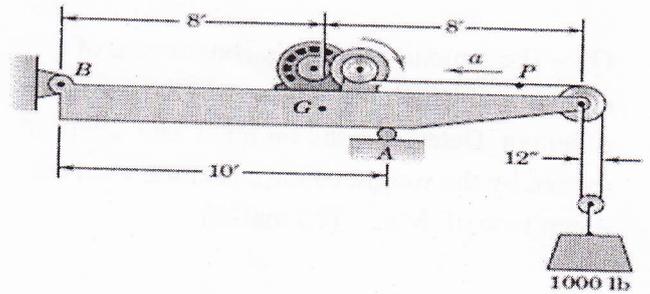
$s_0 = -5\text{m}$, and the initial velocity is $v_0 = 3\text{m/s}$.

(10 marks).

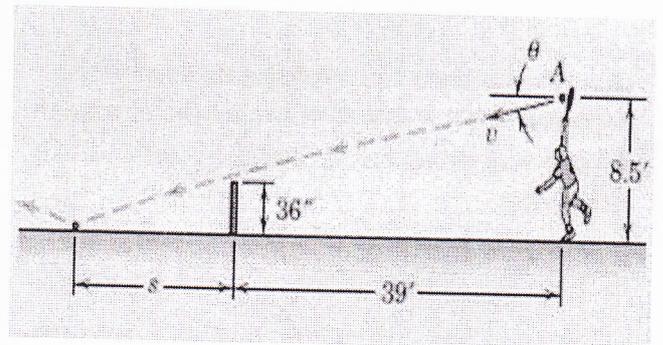
Q5: (A):- Determine the moment of inertia about the x-axis of the square area without and with the central circular hole. (10marks)



(B):- The beam and attached hoisting mechanism together weigh **2400 lb** with center of gravity at **G**. If the initial acceleration **a** of point **P** on the hoisting cable is **20 ft/sec²**, calculate the corresponding reaction at the support **A**. (10 marks)



Q6:- If the tennis player serves the ball horizontally ($\theta = 0$), calculate its velocity **v** if the center of the ball clears the **36-in.** net by **6 in.** Also find the distance **s** from the net to the point where the ball hits the court surface. Neglect air resistance and the effect of ball spin. (20 marks)



Note: Answer five questions

.....**GOOD LUCK**.....