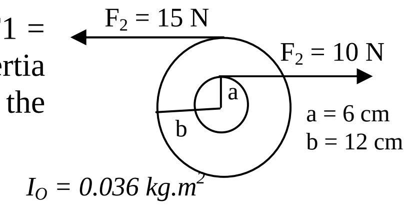
<u>**Chapter 11 (Rotation)**</u>

**1-** A disk of radius 20 cm rotating at 42 rad/sec stops (assume constant deceleration) after 10 sec. Through how many radians does the disk turn during this time? (A: 210 rad)

**2-** A disk is rotating about an axel through its center O when two forces F1 = 10 N and F2 = 15N are applied on it as shown in Fig. The moment of inertia of the disk about O is 0.036 kg.m**2. If the system starts from rest, find the angular speed at time = 3.0 s.  (A: 100 rad/s)



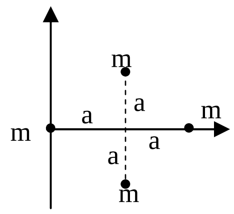

**3-** A torque of 80 N.m applied to a pulley increases its angular speed from 45 rev/min to 180 rev/min in 3 seconds. Find the moment of inertia of the pulley?

**4-** A wheel has a moment of inertia 12 kg*m**2 about its axis of rotation. As it turns through 5.0 rev, its angular velocity increases from 5.0 rad/s to 6.0 rad/s. If the net torque about the axis of rotation is constant, its value is: (A: 2.1 N*m)

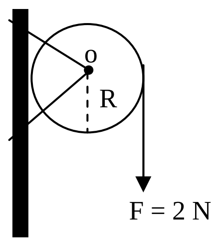
**5-** A disk has a moment of inertia 6.0 kg*m**2 about a fixed axis of rotation. It has a constant angular acceleration of 2.0 rad/s**2. If it starts from rest, the work done during the first 5.0 s by the net torque on it is: (A: 300 J)

**6**- A wheel, starting from rest, turns through 8.0 revolutions in a time interval of 17 s. Assuming constant angular acceleration, what is the angular speed of the wheel at the end of this time interval? (A: 5.9 rad/s)

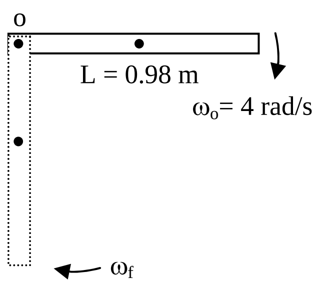
**7**- Four identical particles, each with mass m, are arranged in the xy plane as shown in figure. They are connected by light rods to form a rigid body. If m=2.0 kg and a=1.0 m, the moment of inertia of this system about the y-axis is: (A: 12 kg*m**2)




**8**- A wheel with a moment of inertia of 5.0 kg*m**2 and a radius of 0.25 m rotates about a fixed axis perpendicular to the wheel and through its center as shown in figure 10. A force of 2.0 N is applied tangentially to the rim. As the wheel rotates through one revolution, what is the work done by the force? (A: 3.14 J)




**9** - A uniform rod of length L= 0.98 m and mass M=3.0 kg is free to rotate on a frictionless pin through one end (See Fig). The rod has an angular speed of 4.0 rad/s when it was in the horizontal position. What is the angular speed at its lowest position?  (A: 6.8 rad/s)




**10**- The four particles in Fig (6) are connected by rigid rods of negligible mass. Calculate the moment of inertia of this system about the x axis. (A: 63 kg.m**2)