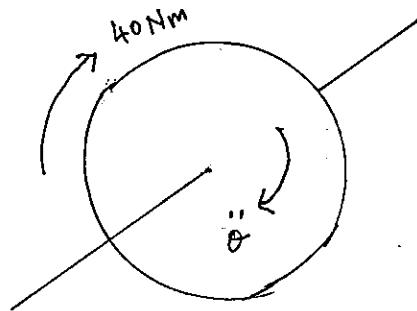


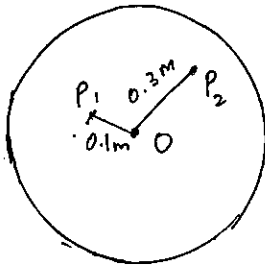
Lesson 2

Flywheel Problems

1. The MI of a flywheel about its axis is 20 kgm^2 . When it is stationary, a constant torque of 40 Nm is applied to the flywheel. Find its kinetic energy after three seconds assuming the flywheel has smooth bearings. (A flywheel is either a circular disc or a circular rim which can rotate through its centre perpendicular to the flywheel)



2. A uniform circular disc has mass 1 kg and radius 0.5 m . Particles P_1 and P_2 of mass 0.2 kg and 0.5 kg respectively are attached to the disc at distances 0.1 m and 0.3 m respectively from the centre O of the disc. The disc is rotating in a horizontal plane about a smooth vertical axis through its centre O . Calculate the kinetic energy of the system when the disc is rotating at 5 rad s^{-1} .



3. A flywheel can rotate about a smooth horizontal axis passing through its centre of mass, and its MI about this axis is 25 kgm^2 . The flywheel is rotating with a constant angular speed of 3 rad s^{-1} when a constant torque of magnitude 5 Nm is applied to it so that it comes to rest. Find the time taken to stop and the total angle the flywheel turns through in that time.