

Lukhdhirji Engineering College, Morbi
Department of Mechanical Engineering

Assignment 09 – Power Screw and Threaded Joint (CO 02&03)

Subject: Fundamental of Machine Design (3141907)

Semester: 4th

Year: 2022-23

1. Prove that the power screw is 'self-locking' only when its efficiency is less than 50%.
2. Draw neat sketch of a typical Screw Jack and label its principle parts.
3. Derive the equation of Torque Required to Raise Load by Square Threaded Screws.
4. A vertical screw with single start square threads of 50 mm mean diameter and 12.5 mm pitch is raised against a load of 10 kN by means of a hand wheel, the boss of which is threaded to act as a nut. The axial load is taken up by a thrust collar which supports the wheel boss and has a mean diameter of 60 mm. The coefficient of friction is 0.15 for the screw and 0.18 for the collar. If the tangential force applied by each hand to the wheel is 100 N, find suitable diameter of the hand wheel.
5. A vertical two start square threaded screw of a 100 mm mean diameter and 20 mm pitch supports a vertical load of 18 kN. The axial thrust on the screw is taken by a collar bearing of 250 mm outside diameter and 100 mm inside diameter. Find the force required at the end of a lever which is 400 mm long in order to lift and lower the load. The coefficient of friction for the vertical screw and nut is 0.15 and that for collar bearing is 0.20.