

### KOM TEST 2

Q1 (a) Determine the width of a 9.75 mm thick leather belt required to transmit 15 kW from a motor running at 900 r.p.m. Diameter of the driving pulley of the motor is 30 cm. The driven pulley runs at 300 r.p.m and the distance between the centre of the two pulleys is 3 meters. The mass of the leather is  $1 \times 10^{-4}$  kg/cm<sup>3</sup>. Maximum allowable stress in the leather is 250 N/cm<sup>2</sup>. Coefficient of friction between the leather and pulley is 0.30. Assume open belt drive and neglect the sag and slip of the belt.

(b) Difference between slip and creep

Q2 A cam rotating clockwise at a uniform speed of 1000 r.p.m. is required to give a roller follower the motion defined below :

1. Follower to move outwards through 50 mm during 120° of cam rotation,
2. Follower to dwell for next 60° of cam rotation,
3. Follower to return to its starting position during next 90° of cam rotation,
4. Follower to dwell for the rest of the cam rotation.

The minimum radius of the cam is 50 mm and the diameter of roller is 10 mm. The line of stroke of the follower is off-set by 20 mm from the axis of the cam shaft. If the displacement of the follower takes place with uniform and equal acceleration and retardation on both the outward and return strokes, draw profile of the cam and find the maximum velocity and acceleration during out stroke and return stroke.