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Department of Mechanical Engineering

UMT 304: Theory of Machines

Tutorial Sheet No 1

Example-1

The centre-to-centre distance between the two sprockets of a chain derive is 600mm. The chain drive is used to reduce the speed from 180 rpm to 90 rpm on the driving sprocket has 18 teeth and a pitch circle diameter of 480 mm. Determine the

1. Number of teeth on the driven sprocket
2. Pitch and the length of the chain

Answers: 36, 41.8mm, 2.351m

Example-2

A chain drive is used for reduction of speed from 240 r.p.m. to 120 r.p.m.The number of teeth on the driving sprocket is 20. Find the number of teeth on the driven sprocket. If the pitch circle diameter of the driven sprocket is 600 mm and centre-to-centre distance between the two sprockets is 800 mm, determine the pitch and length of the chain.

Answers: 40, 47.1mm, 3.0615m

Example-3

An engine, running at 150 r.p.m., drives a line shaft by means of a belt. The engine pulley is 750 mm diameter and the pulley on the line shaft being 450 mm. A 900 mm diameter pulley on the line shaft drives a 150 mm diameter pulley keyed to a dynamo shaft. Find the speed of the dynamo shaft, when 1. there is no slip, and 2. there is a slip of 2% at each drive.

Answers: 1500 r. p. m, 1440 r. p. m.

Question 1

Draw neat sketch of (*a*) Paucellier straight line mechanism (*b*) Automobile steering gear mechanism and (*c*) Grass-hopper mechanism.

Question 2

Draw neat sketch of various types of (*a*) Cam (*b*) Follower.
