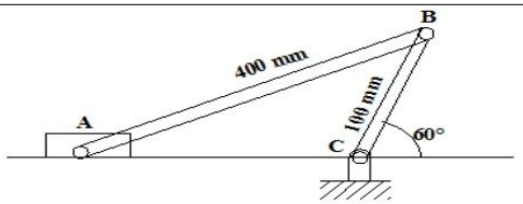
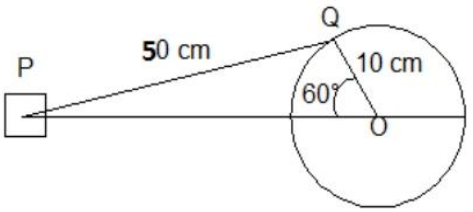
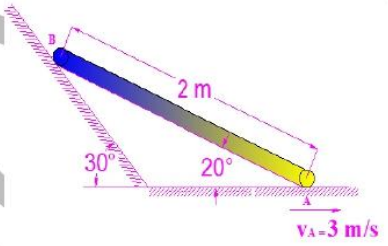
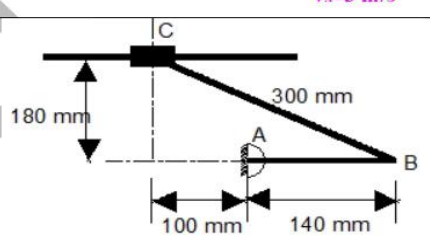
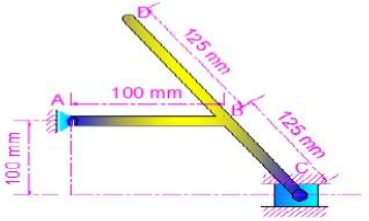
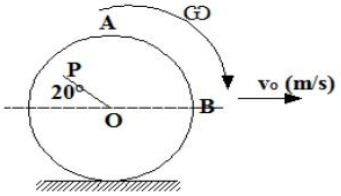
Assignment 5
Module 5
KINEMATICS OF RIGID BODIES

1	**The crank BC of a slider crank mechanism is rotating at constant speed of 30 rpm clockwise. Determine the velocity of the piston A at the given instant.** **(vA = 0.237 m/s)**	
2	**For crank of concentric mechanism, determine the instantaneous centre of rotation of connecting rod. The crank OQ rotates clockwise at 310 rpm. Crank length = 10 cm, connecting rod length = 50 cm. Also find the velocity of P & angular velocity of rod at that instant.** **(vQ = 3.24 m/s, ωPQ = 5.63 r/s, vP = 1.9142 m/s)**	
3	**A bar AB 2 m long slides down the plane as shown in figure. The end A slides on the horizontal floor with a velocity of 3 m/s. Determine the angular velocity of the rod AB and the velocity of end B for the position shown.** **(ωAB = 0.763 r/s, vB = 2.868 m/s)**	
4	**In figure collar C slides on a horizontal rod. In the position shown rod AB is horizontal and has angular velocity of 0.6 rad/sec clockwise. Determine angular velocity of BC and velocity of collar C.** **(ωBC = 0.35 rad/sec, vc = 63 mm/sec)**	
5	**At the position shown in figure, the crank AB has angular velocity of 3 rad/sec clockwise. Find the velocity of slider C and point D at the instant shown, AB = 100 mm.** **(vC = 0.4 m/s, ωCD = 4 r/s, vD = 0.72 m/s)**	
6	**A wheel is rolling along a straight path without slipping. Determine velocity of points A, B & P. OP = 600 mm, ω = 4 rad/s, vO = 4 m/s, Diameter = 2 m.** **(vB = 5.656 m/s, vA = 8 m/s, vP = 5.32 m/s)**	
7	**A roller of diameter 0.8 m rolls without slipping between two parallel plates as shown in figure. Locate ICR and find angular velocity of the wheel.** **(ω = 12.5 r/s)**