Department of Mechanical Engineering
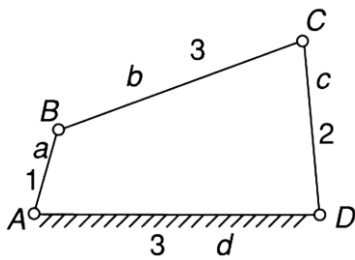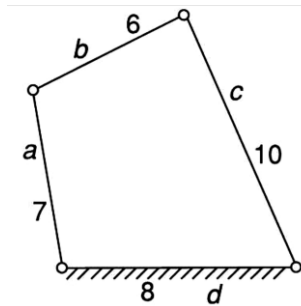
UMT 304: Theory of Machines
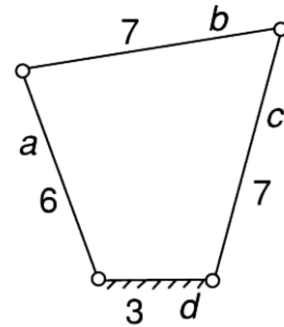
Tutorial Sheet No 4

1. Find the maximum and minimum transmission angles for the mechanisms shown in figure. The figures indicate the dimensions in standard units of length.

   (*a*) Crank-rocker Mechanism   (*b*) Double-rocker   (*c*) Double-crank

   [Ans: (a) 104.5˚, 41.4˚, (b) 137.9˚, 38˚, (c) 87.7˚, 25.2˚]

2. A crank-rocker mechanism has a 70-mm fixed link, a 20-mm crank, a 50- mm coupler and a 70 mm rocker. Draw the mechanism and determine the maximum and minimum values of the transmission angle. Locate the two toggle positions and find the corresponding crank angles and the transmission angles.

   [Ans: 95.7˚, 45.6˚, 77.6˚, 60˚]

3. A crank-rocker mechanism ABCD has the dimensions AB = 30 mm, BC = 90 mm, CD = 75 mm and AD (fixed link) = 100mm. Determine the maximum and the minimum values of the transmission angle. Locate the toggle positions and indicate the corresponding crank angles and transmission angles.

   [Ans: 103˚, 49˚, $\theta = 228$˚, $\mu = 92$˚, $\theta = 38.5$˚, $\mu = 56$˚]

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