HW 2
(ME352A)

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Q.1 For the mechanism in Figure 1, input link AD is rotated as shown with constant angular velocity 2 rad/sec, ccw. Find the angular velocity and acceleration of coupler DC with respect to ground at an instant when (a) ∠BAD is 180° and (b) when ∠BAD is 140°. Given: BC = CD = $\sqrt{2}a$ and AD = AB = a.

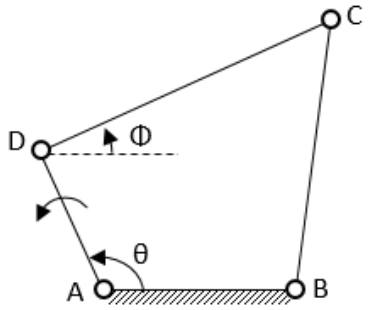

Figure 1

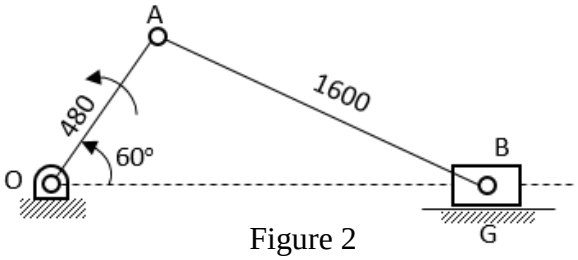

Figure 2

Q.2 For the given configuration of the slider-crank mechanism (Figure 2), find the instantaneous values of the (a) acceleration of the slider at B, and (b) the angular velocity and acceleration of the link AB. It is given that link OA rotates steadily at 18 rad/sec ccw as shown. Dimensions (480 and 1600) are in mm.

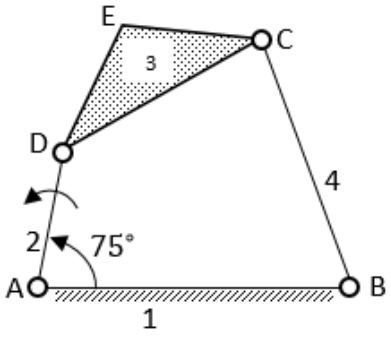

Figure 3

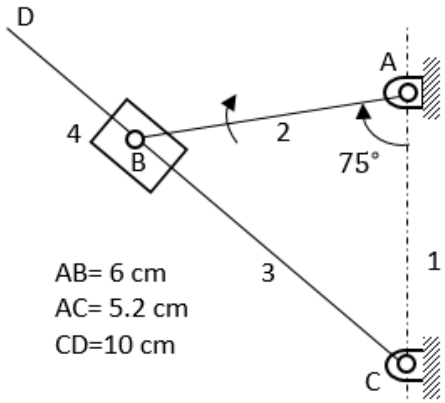

Figure 4

Q.3 Find the velocity and acceleration of point E of link 3 of the mechanism shown in Figure 3. Input link AD rotates steadily at 5 rad/sec ccw. AD = 0.8 m, DC = 0.94 m, CB = 0.95 m, AB=0.9 m, and DE = EC = 0.54 m.

Q.4 Find the velocity and acceleration of hinge point B on sliding link 4 (Figure 4). Angular velocity of link 2 is 3 rad/sec in the clockwise direction, constant over some interval of time.