



**Continuous Assessment Test – I**

**B.Tech (Mechanical Engineering), Fall-2019-2020**

**Course Name & Code:** Mechanics of Machines (MEE2004)  
**Class Number:** VL2019201001540/ VL2019201000884/ VL2019201000776  
**Faculty:** Prof. Niranjana Behera/ Prof. Mohan Varma D. S./ Prof. Anil P. M.  
**Slot:** A2  
**Exam Duration:** 90 mins **Maximum Marks:** 50

(Answer all questions)

1. Define inversion of a mechanism. Briefly describe the different inversions of single slider crank mechanism with neat sketches. [10]
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 minimum and maximum values of the transmission angle. Locate the two toggle positions and find the corresponding crank angles and the transmission angles. [10]
3. In Figure 1, the angular velocity of the crank OA is 600 r.p.m. Determine (i) the linear velocity and the linear acceleration of the slider D and (ii) the angular velocity and angular acceleration of the link BD, when the crank is inclined at an angle of  $75^\circ$  to the vertical. The dimensions of various links are: OA = 28 mm; AB = 44 mm; BC = 49 mm; and BD = 46 mm. The centre distance between the centres of rotation O and C is 65 mm. The path of travel of the slider is 11 mm below the fixed point C. The slider moves along a horizontal path and OC is vertical. [20]

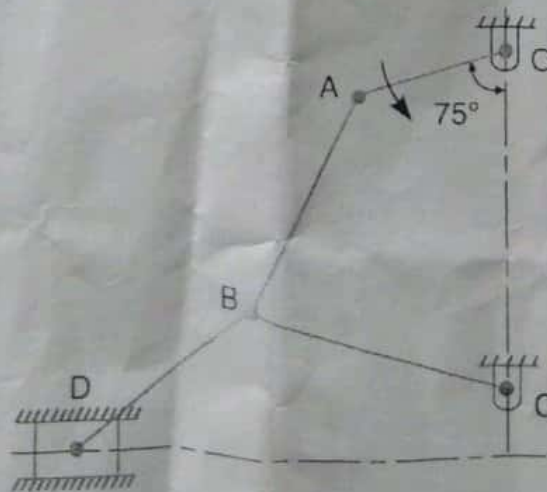


Figure 1

P.T.O



4. A cam operating a knife-edge follower has the following data:
- a) Follower moves outwards through 40 mm during  $60^\circ$  of cam rotation
  - b) Follower dwells for the next  $60^\circ$
  - c) Follower returns to its original position during the next  $120^\circ$
  - d) Follower dwells for the rest of rotation

The displacement of the follower is to take place with uniform velocity during the both outward and return strokes. The least radius of rotation is 50 mm. Draw the profile of the cam when the axis of the follower passes through the cam axis. [10]

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