



**BANGLADESH UNIVERSITY OF ENGINEERING & TECHNOLOGY**  
**DEPARTMENT OF MECHANICAL ENGINEERING**

**Course No.: ME 346 (Mechanics of Machinery Sessional)**

**Problem Class: 02 (C1)**

**Date: 25 March, 2015**

Class Problems:

1. A cam rotating clockwise at a uniform speed of 100 rpm is required to give motion to knife-edge follower as below:
  - (a) Follower to move outwards through 25 mm during  $120^\circ$  of cam rotation,
  - (b) Follower to dwell for the next  $60^\circ$  of cam rotation,
  - (c) Follower to return to its starting position during next  $90^\circ$  of cam rotation, and
  - (d) Follower to dwell for the rest of the cam rotation.

The minimum radius of the cam is 50 mm and the line of stroke of the follower passes through the axis of the cam shaft. If the displacement of the follower takes place with uniform and equal acceleration and retardation on both the outward and return strokes, find the maximum velocity and acceleration during outstroke and return stroke.

2. A rotating shaft carries four masses A, B, C and D which are radially attached to it. The mass centers are 30 mm, 38 mm, 40 mm and 35 mm respectively from the axis of rotation. The masses A, C and D are 7.5 kg, 5 kg and 4 kg respectively, The axial distances between the planes of rotation of A and B is 400 mm and between B and C is 500 mm. The masses A and C are at right angles to each other. Find for a complete balance,
  - (a) the angles between the masses B and D from mass A,
  - (b) the axial distance between the planes of rotation of C and D,
  - (c) the magnitude of mass B.