

OR

- 6 Design a four link mechanism when motions of the input and the output links are governed by a function $y = x^2$ and x varies from 0 to 2 with no error at $x = 0, 1$ and 2. Assume angular position of input link θ to vary from 50° to 150° and angular position of output link ϕ vary from 80° to 160° . Assume the length of fixed link as 100mm. (16 Marks)

Module-4

- 7 a. Define: i) Module ii) Circular pitch iii) Backlash. (06 Marks)
 b. Two spur gears have 24 and 30 teeth of module = 10mm, standard addendum = 1 module and pressure angle = 20° . Determine:
 i) Length of path of contact
 ii) Length of arc of contact
 iii) Contact ratio. (10 Marks)

OR

- 8 a. Sketch and explain: i) Compound gear train ii) Epicyclic gear train (06 Marks)
 b. In the epicyclic gear train shown in Fig.Q.8(b), the internal gear D is fixed and the sun gear A rotates at 120rpm CCW direction. The number of teeth on gear A, B and C are 60, 40 and 25 respectively. Determine the speed and sense of the arm E. (10 Marks)

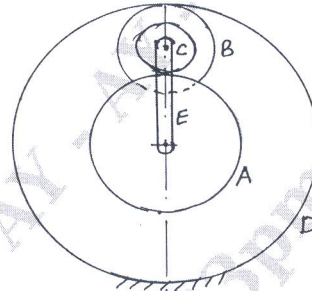


Fig.Q.8(b)

Module-5

- 9 Draw the profile of the cam to give the following motion to a flat faced reciprocating follower:
 i) Follower to raise through 24mm during 150° of the cam rotation with SHM.
 ii) Follower to dwell for the next 30° of the cam rotation.
 iii) Follower to return to the initial position during 90° of the cam rotation with SHM.
 iv) Follower to dwell for the remaining 90° of cam rotation.
 Take the minimum radius of the cam as 25mm. (16 Marks)

OR

- 10 The following data relate to a symmetrical circular cam operating a flat faced follower:
 Minimum radius of the cam = 40mm
 Lift = 24mm, angle of lift = 75°
 Nose radius = 8mm
 Speed of the cam = 420rpm
 Determine the main dimensions of the cam and the acceleration of the follower at the
 i) Beginning of the lift
 ii) End of contact with circular flank
 iii) Beginning of contact with the nose
 iv) Apex of the nose. (16 Marks)
