

Assignment 2

Q.1 Classify the different types of followers with sketches.

Q.2 What are the different types of motion with which a follower can move?

Q.3 Draw the displacement, velocity and acceleration diagrams for a follower when it moves with simple harmonic motion.

Q.4 A cam is to be designed for a knife edge follower with the following data : **1.** Cam lift = 40 mm during 90° of cam rotation with simple harmonic motion. **2.** Dwell for the next 30° . **3.** During the next 60° of cam rotation, the follower returns to its original position with simple harmonic motion. **4.** Dwell during the remaining 180° . Draw the profile of the cam when the line of stroke of the follower passes through the axis of the cam shaft, The radius of the base circle of the cam is 40 mm. Determine the maximum velocity and acceleration of the follower during its ascent and descent, if the cam rotates at 240 r.p.m.

Q.5 A cam, with a minimum radius of 25 mm, rotating clockwise at a uniform speed is to be designed to give a roller follower, at the end of a valve rod, motion described below : **1.** To raise the valve through 50 mm during 120° rotation of the cam ; **2.** To keep the valve fully raised through next 30° ; **3.** To lower the valve during next 60° ; and **4.** To keep the valve closed during rest of the revolution i.e. 150° ; The diameter of the roller is 20 mm and the diameter of the cam shaft is 25 mm. Draw the profile of the cam when the line of the stroke is offset 15 mm from the axis of the cam shaft. The displacement of the valve, while being raised and lowered, is to take place with simple harmonic motion. Determine the maximum acceleration of the valve rod when the cam shaft rotates at 100 r.p.m. Draw the displacement, the velocity and the acceleration diagrams for one complete revolution of the cam.