ME3020: Kinematics and Dynamics of Machines (Practical Sessions)
Session: 3

1. Using MATLAB plot polar plot for the CAM profile for a knife edge follower as per following specifications. Plot the SVAJ diagram (for plotting multiple plots in single display use subplot command in MATLAB). For the same. Base radius =10mm, Max rise=8mm.

Segment Number	Function Used	Start Angle (deg)	End Angle(deg)	Delta Angle(deg)
1	Dwell	0	60	60
2	Polynomial rise	60	120	60
3	Dwell	120	240	120
4	Polynomial Fall	240	300	60
5	Dwell	300	360	60

Rise Equation

$$s = h\left[64\left(\frac{\theta}{\beta}\right)^3 - 192\left(\frac{\theta}{\beta}\right)^4 + 192\left(\frac{\theta}{\beta}\right)^5 - 64\left(\frac{\theta}{\beta}\right)^6\right]$$

Fall Equation

$$s = h\left[35\left(\frac{\theta}{\beta}\right)^4 - 84\left(\frac{\theta}{\beta}\right)^5 + 70\left(\frac{\theta}{\beta}\right)^6 - 20\left(\frac{\theta}{\beta}\right)^7\right]$$

2. Using MATLAB plot polar plot for the CAM profile for a knife edge follower as per following specifications. Plot the SVAJ diagram for the same. Base radius =5mm, Max rise=9mm

Segment Number	Function Used	Start Angle (deg)	End Angle(deg)	Delta Angle(deg)
1	Dwell	0	60	60
2	Polynomial Rise	60	150	90
3	Dwell	150	240	90
4	Polynomial Fall	240	300	60
5	Dwell	300	360	60

Polynomial Equation

$$s = h\left[10\left(\frac{\theta}{\beta}\right)^3 - 15\left(\frac{\theta}{\beta}\right)^4 + 6\left(\frac{\theta}{\beta}\right)^5\right]$$

Derive v , a and j to plot the graph