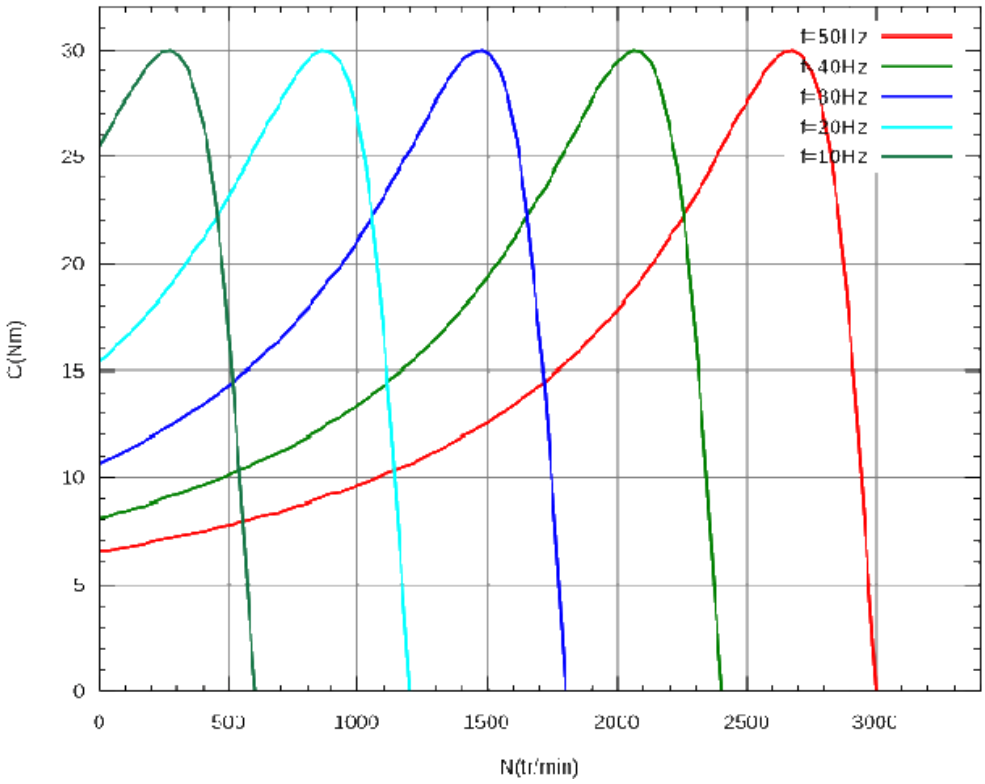
SIMULINK SIMULATION

V/f method of speed control of Induction Motor is a very widely used speed control method in industry.

In this method, the air gap flux of the induction motor is kept constant and thus the V/f ratio remains constant.



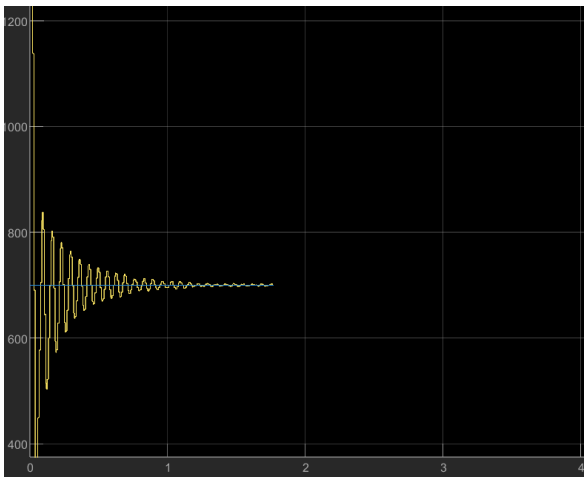
This method provides for a good speed regulation as seen from the above figure.

It is however observed that the maximum torque driven by motor remains constant in this method.

Observations for simulation

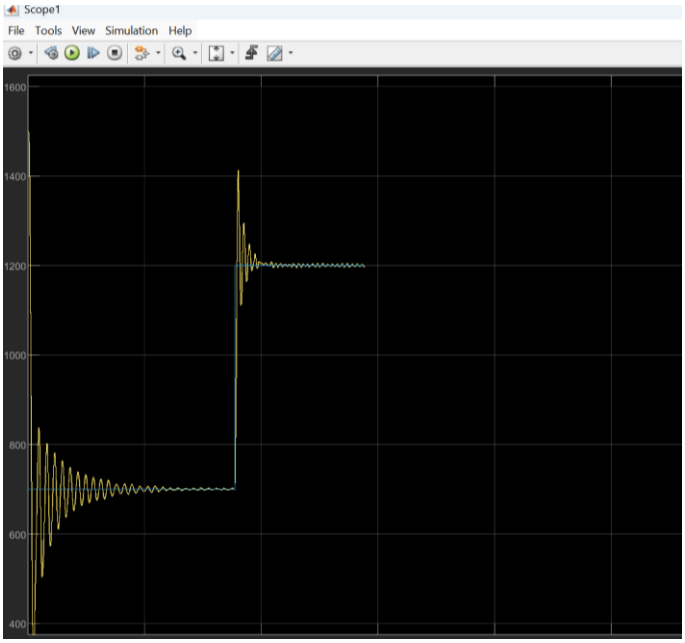
1) Speed of motor vs time

- Initially speed is set to 700 rpm.

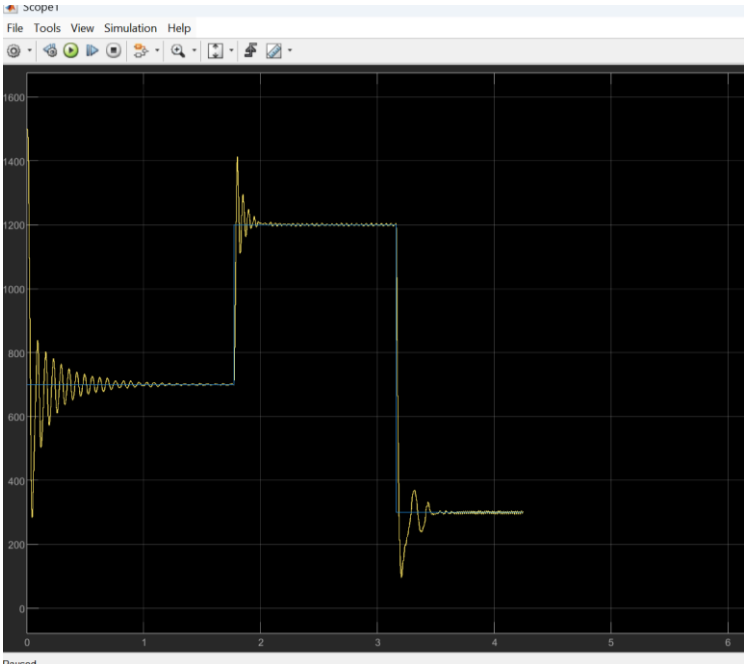


The initial oscillations seen is the transient state error which is eventually reduced to zero by the PI controller.

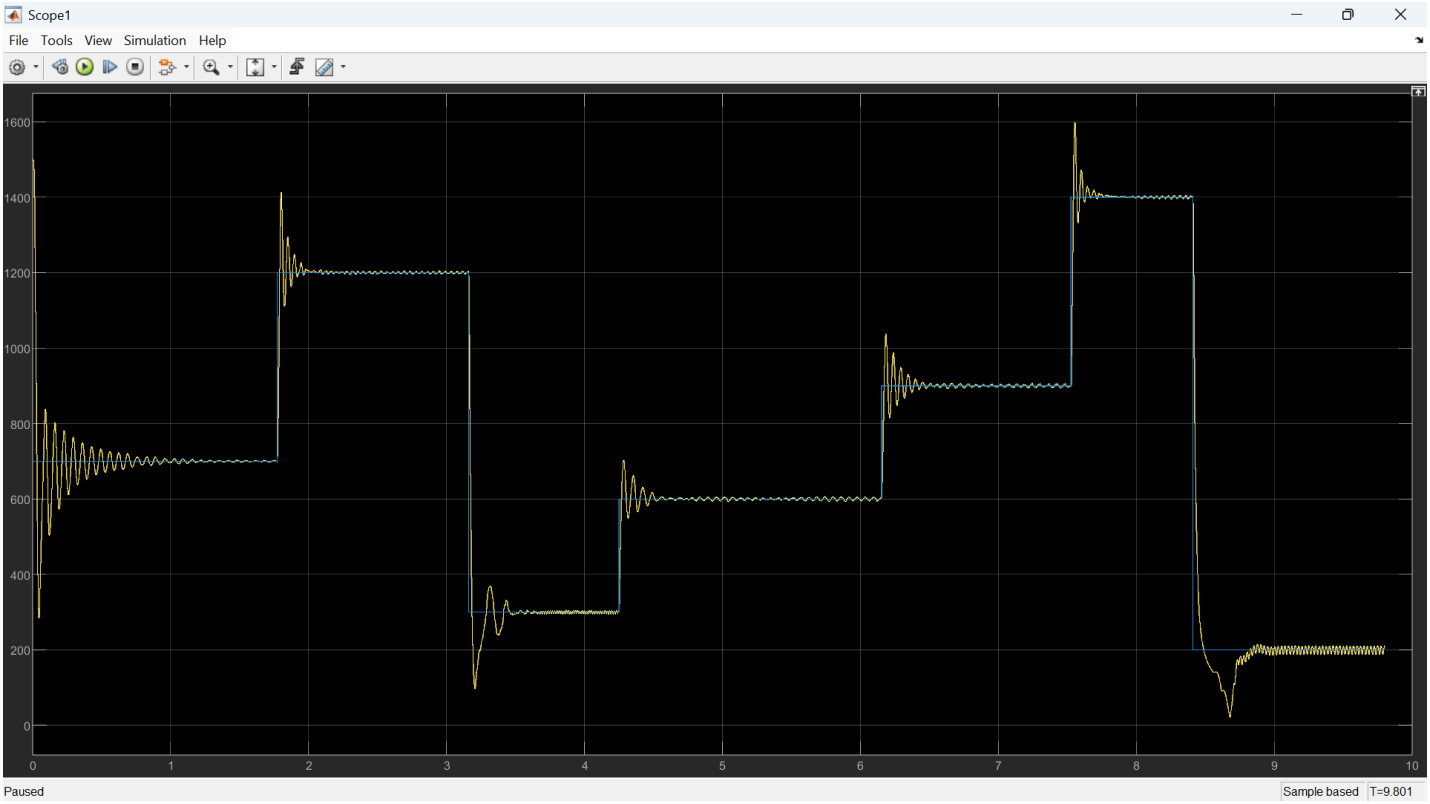
- The speed is then increased to 1200 rpm.



- Speed then changed to 300 rpm.

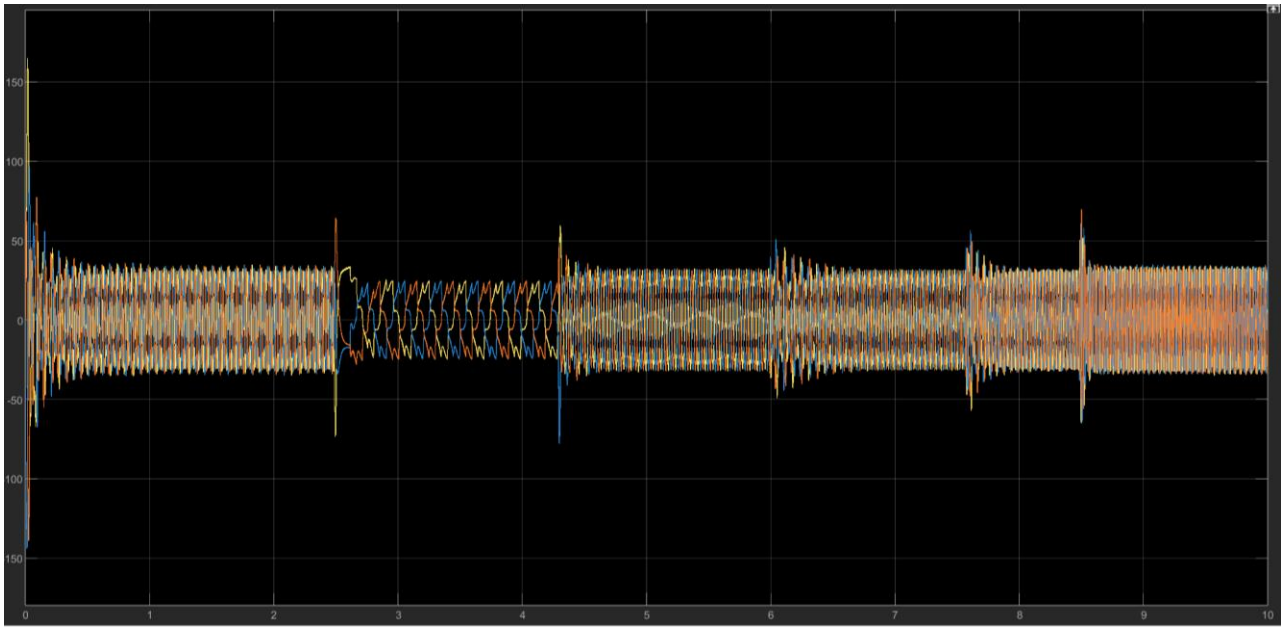


- Now speed is changed in steps from 300 rpm to 600,900 ,1400 and 200 rpm.



This sequence of speed regulations shows that the Simulink simulation is working fine.

2) Three phase current vs time



- The above figure shows the changes in three phase current in induction motor during the series of speed changes using v/f control.
- For low speed of induction motor, the applied frequency needs to be reduced and for high speed of induction motor , applied frequency needs to be increased. This relative increase or decrease in frequency is evident from the relative spacing of the three phase current waveforms w.r.t time in the above figure.
- When there is any change in speed there is a momentary spike in three phase current flowing in stator of the induction motor.