**Design and simulation of a phase Induction motor (Asynchronous motor) for different load conditions in MATLAB/Simulink software**

**Components Required**

|  |  |  |
| --- | --- | --- |
| SL. NO. | Apparatus Required | Quantity |
| 1 | Asynchronous motor | 1 |
| 2 | Ac voltage source | 3 |
| 3 | Powerful | 1 |
| 4 | Scope | 3 |
| 5 | Display | 3 |
| 6 | Sum | 1 |
| 7 | Step | 4 |
| 8 | Bus selector | 3 |
| 9 | Gain | 1 |

**Circuit Diagram**

**Types of torques in induction motor**

**Vmax = \*400/ = 326.54 V [**Amplitude**] 400 = RMS**

Ta = Gross mechanical torque (or) motor torque

Tlost = Loss torque due to friction, windage and iron losses

Tsh (or) TL= Load torque

Ta = Tlost + Tsh

Power (Pout)=Tsh\*

Tsh= Pout/

Pout = 4000 watts

= 260

= 21430/60

=149.67 rad/sec.

Tsh = 4000/149.67

or

Tsh (or) TL= 26.72 N-M

TL/2 = 13.36 N-M

TL/4 = 6.68N-M

**Speed and motor torque values for different load conditions**

|  |  |  |  |
| --- | --- | --- | --- |
| Load torque (TL) in N-M | | Motor torque (T) in N-M | Speed(N) in RPM |
| TL at 3 sec | TL |  |  |
| TL at 5 sec | TL/2 |  |  |
| TL at 10 sec | TL/4 |  |  |
| TL at 13 sec | 0 |  |  |