MOTOR SIZEING AND BATTERY SIZEING

# MOTOR SIZEING:

## The formula used are:

### Torque Calculation :

T = F \* r = F \* D / 2

### Vertical force Calculation :

F = W = m \* g

### Horizontal force Calculation :

F = 𝜇 \* W

𝜇 - coefficient of friction

### Inclined force Calculation :

F = F(downward) + m \* g \* ( sin𝜃 + 𝜇 cos𝜃 )

### Load Torque Calculation :

T(load) = ( ( 𝜇𝐹𝐴 + 𝑚𝑔 ) \* 𝐷 ) / 2

### Load Torque required by a wheel in (N-m) :

T(load) = ( m g D ) / 2

### Load Torque required by a wheel in (Kg-cm) :

T(load) = ( m D ) / 2

### Total Torque with FOS :

T(total) = T(load) \* FOS

In our case FOS = 1.5,

## MOTOR SIZEING: Types and number of motors used in bottle capping machine:

|  |  |  |
| --- | --- | --- |
| SL.NO | WORKS OF MOTORS | TYPE OF MOTOR |
| 1. | CONVEYOUR BELT MOVER | DC MOTOR |
| 2. | LIFTING MOTOR | DC MOTOR |
| 3. | CAP FITTER | DC MOTOR |
| 4. | CAP PLACER | STEPPER MOTOR |

# Selected motors with their RPM ,Voltage requirement and current consumption

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SL.NO | SELECTED MOTOR TYPE | RPM | CURRENT CONSUMPTION | VOLTAGE REQUIREMENT |
| 1 | DC motor | 30 | 300mAmp | 12V |
| 2 | DC motor | 60 | 300mAmp | 12V |
| 3 | DC motor | 60 | 300mAmp | 12V |
| 4 | STEPPER motor |  |  | 5V |

# Selection of Battery:

For our project 12V ,1.5Amp required.