Motor sizing of DC motor

Torque of the DC motor is calculated by T=F×D/2.

Force= M×g (M=Mass in kg,g is the acceleration due to gravity)

F=250 ×10^-3×9.8

=2.452 N

Hence,

Torque=2.452×0.5

=1.23 Ncm

Factor of Safety(f) =1.5

T=F×D/2×f

=1.839 kgcm

The Speed of motor should be 60 rpm.

MOTOR SIZING FOR SERVO MOTOR

Number of Servo motor used are 2

So,

T=F×D/2×f

=9.4kg-cm

So Torque produced by each servo motor is=9.4 kgcm.

The Speed of motor should be at least of 65-70rpm.

maximum current drawn by dc motor = 300mA

Battery Sizing

Maximum current drawn by servo motor = 200mA

no of dc motors used = 1

no of servo motors used = 2

Running time = 3 hr

I = (current drawn by motor) x (running time) x (no of motors used)

= (300 x 3 x 1) (200 x 3 x 2)

= 2100 mAh

= 2.1Ah