Design of Balance Bot

1) Motor Torque Requirement :

component	mass(g)	distance from ground(cm)	m*l (gcm)
motor	92.2 (left)+93 (right)	3.5	648.2
battery	231	7.9	1824.9
controller board	35.3	15	529.5
motor driver+switch	40.6	6.8	276.08
wheel	57,60.7	3.5	411.95
mpu6050	1.3	3.5	4.55
motor holder	19.6,20.9	3.5	141.75
screws	8.4		
wood chasis	112.6	9.5	1069.7
others	22.8		
total	776	15	4906.63

center of mass	
x	3.6(cm)
y	8.5(cm)
z	6.323(cm)
mimimum torque of motor	2.19(kgcm)

2) Minimum PWM of Motor:

The minimum PWM value of motor is the value of PWM at which the motor starts to rotate. This is determined by trial and error technique. By increasing the pwm from 0 to the value at which it just starts to rotate. The min pwm in this case is given below.

right motor min pwm 55(21% duty cycle)

left motor min pwm 63(24 % duty cycle)

3) Offsets :

MPU6050 accelerometer:	
x offset	1204.73333
y offset	64.8
z offset	2153.469
gyroscope	
x offset	20.665