Photom Technologies

Let's keep the sun shining

**ELECTRONICS ASSIGNMENT**

1. **Prepare the Schematic, PCB Design, Bill of Materials (BOM) and Arduino code for the following problem statement:**

   There is a battery powered robotic system which is operated through Four DC Motors (M1, M2, M3 and M4), in which;
   a. M1 and M2 are operated in same direction with same parameters
   b. M3 and M4 is operated in opposite direction of other two
   c. The battery voltage is ranging from 29.2V to 22V and we have to maintain the same speed (40 RPM for M1, M2 and 180 RPM for M3, M4) of motors for all the voltage values
   M1, M2 RPM at 29.2V: 60
   M1, M2 RPM at 22V: 40
   M3, M4 RPM at 29.2V: 240
   M3, M4 RPM at 22V: 180
   d. There are two inductive sensor on both the sides of the robotic system which detect the barrier and reverse the directions of all the motors based on the feedback.

   **Desired functions of system:**
   a. Operation of all DC Motors, while M1 and M2 are running for 150 m and then reverse the direction after detecting a barrier.
   b. Suggest alternative options for end detector sensors. What measures should be taken for accidental triggering of sensors.
   c. Frequent measurement of current and voltage of battery and motors.
   d. Measurement of travelled length through encoder.
   d. Performance monitoring of each DC Motor.
   e. Data communication to the web server using GPRS.

   **Notes:**
   * Any software can be used for PCB Designing (Eagle CAD is preferable).
   **You are free to select the components based on the requirement and choice
   ***Battery Ratings: 24V, 24 Ah. Motor Ratings: 24 V, 5 A.

2. **Suggest suitable motor drivers for the following operating conditions:**
   a. Temperature range: 0-65$^0$C
   b. Rain: 0-300 mm