

APPROXIMATE ESTIMATE OF ITEMS AND JUSTIFICATION

SINo	Description	Qty
1	<p>Development Board</p> <p>Operating Voltage 5V Input Voltage (recommended) 7-12V Input Voltage (limit) 6-20V Digital I/O Pins 54 (of which 15 provide PWM output) Analog Input Pins 16 DC Current per I/O Pin 20 mA DC Current for 3.3V Pin 50 mA Flash Memory 256 KB of which 8 KB used by bootloader SRAM 8 KB EEPROM 4 KB Clock Speed 16 MHz LED_BUILTIN 13 Length 101.52 mm Width 53.3 mm Weight 37 g</p>	3
2	<p>Development Board</p> <p>Microcontroller: LPC2148 with 512K on chip memory. Crystal for LPC2148: 12Mhz. Crystal for RTC: 32.768KHz. 50 pin Berg header for external interfacing. Operating Supply: 9V DC/AC. 2.4GHz ZigBee (XBee) wireless module adaptor. 512 bytes of I2C external EEPROM. USB Type B Connector.</p>	3
3	<p>Raspberry-Pi 3</p> <p>Quad Core 1.2GHz Broadcom BCM2837 64bit CPU. 1GB RAM. BCM43438 wireless LAN and Bluetooth Low Energy (BLE) on board. 100 Base Ethernet. 40-pin extended GPIO. 4 USB 2 ports. 4 Pole stereo output and composite video port. Full size HDMI.</p>	5

SINo	Description		Qty	
4	Micro SD card (16 GB)	Capacity 16 GB Standard SDA 3.0 Dimensions (L x W x H) 5 x 11 x 1.0mm Weight 0.25g Voltage 2.7~3.6V Performance Seq Read/Write rate up to 50 / 10 (MB/s)** Random Read/Write: 1400 /100 (IOPs)** Certifications FCC, CE, BSMI, VCCI Warranty 5 Years Note **Read/write speed based on internal testing; performance may be lower depending on host device. Speed Class Speed Class: Class 10 Compatibility Smartphone/ Tablet/ Car black box Operating temperature -25°C (-13°F) ~ 85°C (185°F)		3
5	USB Adapter 2A	Adapter type: Switching Input voltage: 100 ... 240 V AC AC input frequency: 50 / 60 Hz Output voltage: 5.0 V DC Output current: 2.0 A Output power: 10.0 W Output: USB-A Color: White Weight: 0.032 kg Dimensions: 69 x 37 x 22 mm Warranty: 2 years		6
6	12 V, 1 Amp SMPS	Input Rating : 110-240V AV 50Hz. Output Rating : 12V DC 1Amp 15Watt Peak Load. Size (LWH) : 40X40X22mm. Working Temperature : 0 to 70 degree celsius. 3 Months Brand warranty excluding physical and liquid damage.		1
7	Zigbee Modules 100m range	Supply voltage: 2.8V to 3.4V; Average current consumption at 3.3V: 50mA; Maximum transfer rate 250 kbps; Frequency: 2.4 GHz; Output 1 mW (+ 0 dBm); Transmission range: 100 m; FCC certificate; 6 input ADC (10-bit) input pins; 8 pin digital IO; 128-bit encryption Local or Wireless Configuration; Accepts the AT or API command set;		6

SI No	Description		Qty
8	Zigbee Modules Adapter	<p>Compatible with all ZigBee modules (Series 1 and Series 2.5, standard and Pro)</p> <p>The built-in 3V3 Voltage regulator</p> <p>Onboard 3V3 <->5V level converter (easy to interface 5V Devices)</p> <p>Status LEDs (RX,TX,RSSI,Power)</p> <p>Zig Bee Pins available at 2.54 mm berg strip</p> <p>USB Powered.</p> <p>Small footprint.</p> <p>All XBee pins are broken out.</p> <p>Reset button.</p>	6
9	Metal-gear Servo Motors	<p>Power: 4.8V - 6V DC max</p> <p>Avg Speed: 60° in 0.20 sec (@ 4.8V),</p> <p>60° in 0.16 sec (@ 6.0V)</p> <p>Weight: 62.41g.</p>	6
10	ESP8266 Development Board	<p>Processor: L106 32-bit RISC microprocessor core based on the Tensilica Diamond Standard 106Micro running at 80 or 160 MHz.</p> <p>Memory: ...</p> <p>External QSPI flash: up to 16 MiB is supported (512 KiB to 4 MiB typically included)</p> <p>IEEE 802.11 b/g/n Wi-Fi. ...</p> <p>17 GPIO pins.</p> <p>Serial Peripheral Interface Bus (SPI)</p>	2
11	ESP32 Development Board	<p>Microcontroller: Tensilica 32-bit Single-/Dual-core CPU Xtensa LX6.</p> <p>Operating Voltage: 3.3V.</p> <p>Input Voltage: 7-12V.</p> <p>Digital I/O Pins (DIO): 25.</p> <p>Analog Input Pins (ADC): 6.</p> <p>Analog Outputs Pins (DAC): 2.</p> <p>UARTs: 3.</p> <p>SPIs: 2.</p>	2
12	2-Channel Relay Board (12 volt)	<p>Power supply: 12V.</p> <p>Coil voltage: 12V.</p> <p>Max switching voltage: 250VAC / 30VDC.</p> <p>Max switching current: 10A.</p> <p>logic: 5V.</p>	2
13	2-Channel Relay Board (5 volt)	<p>Supply voltage – 3.75V to 6V</p> <p>Trigger current – 5mA</p> <p>Current when relay is active - ~70mA (single), ~140mA (both)</p> <p>Relay maximum contact voltage – 250VAC, 30VDC</p> <p>Relay maximum current – 10A</p>	2

SINo	Description	Qty
14	L298N Motor Driver Module	4
15	Quad Encoder Geared DC Motor 200 RPM, 12 V DC	8
16	Micro servo motors	4
17	L3G4200 3 axis digital gyroscope	2
18	LSM303 3 axis digital accelerometer and 3 axis magnetometer	2

SINo	Description		Qty
19	Gyroscope, accelerometer and GPS interfacing module for the robot	Operating Voltage 5V (typical) Accelerometer Range $\pm 2g, \pm 4g, \pm 8g, \pm 16g$ Gyroscope Range $\pm 250^\circ/s, \pm 500^\circ/s, \pm 1000^\circ/s, \pm 2000^\circ/s$ Temperature Range -40 to +85°C Absolute Maximum Acceleration Up to 10,000g	2
20	GPS receiver	48 Channel . Frequency LI 1575 MHz, 3.0-3.6 V DC, Position Accuracy 2.5 m, Prorocol- NMEA SiRF Binary , Module Interface - I2C, SPI, UART	2
21	Two Axis Camera pod with Wireless Camera	Image sensor CMOS Image sensor size 1/2.8 Lightfinder Lightfinder 2.0 Wide dynamic range Forensic WDR Min illumination/ light sensitivity (Color) 0.05 lux Min illumination/ light sensitivity (B/W) 0.01 lux	2
22	USB TV Tuner for Interfacing wireless camera with Laptop (supports windows 8)	Package Dimensions 12 x 8 x 5 cm; 80 Grams Operating System Windows, Microsoft Hardware Interface USB, USB 2.0	2
23	Arduino Uno with sensors	Microcontroller: ATmega328P Operating Voltage: 5V Input Voltage (recommended): 7-12V Inout Voltage (limit): 6-20V Digital I/O Pins: 14 (of which 6 provide PWM output) PWM Digital I/O Pins: 6 Analog Input Pins: 6 DC Current per I/O Pin: 20 mA DC current for 3.3V Pin: 50 mA Flash Memory: 32 KB (ATmega328P) of which 0.5 KB used by bootloader SRAM: 2 KB (ATmega328P) EEPROM: 1 KB (ATmega328P) Clock Speed: 16 MHz LED_BUILTIN: 13 Length: 68.6 mm Width: 58.4 mm Weight: 25 g	10
24	Metal-gear Servo Motors	Size: 40x20x40.5mm Weight: 60g Voltage: 4.8V – 6.6V Stall Torque (4.8V): 18.5 kg/cm Stall Torque (7.2V): 21.8 kg/cm Rotation: 180 Degree Gear: Metal Gear	10

SINo	Description	Qty
25	Sharp GP2D120C infrared range sensor (4cm to 30cm)	10
26	Sharp GP2Y0A21YK0F infrared range sensor (10cm to 80cm)	10
27	Sharp GP2Y0A02YK infrared range sensor (20cm to 150cm)	5
28	Sharp GP2Y0A710K0F infrared range sensor (100cm to 500cm)	5

SINo	Description	Qty
29	<p>Maxbotix ultrasonic range sensor</p> <p>Resolution of 1 inch 20Hz reading rate 42kHz Ultrasonic sensor measures distance to objects RoHS Compliant Read from all 3 sensor outputs: Analog Voltage, RS232 Serial, Pulse Width Virtually no sensor dead zone, objects closer than 6 inches range as 6 inches Maximum Range of 254 inches (645 cm) Operates from 2.5-5.5V Low 2.0mA average current requirement Small, lightweight module Designed for easy integration into your project or product Widest beam of the L.V-MaxSonar-EZ sensors Great for people detection applications</p>	5
30	<p>12V Linear Actuator</p> <p>Max Force/Thrust - 8.9 N, External Length- 21.31 mm, Supply voltage - 12 V DC, Product range- 26 DBM-L, Motor Size- 26.16 mm</p>	3
31	<p>12V 1/2 inch solenoid valve</p> <p>Rated Operating Voltage - 12V DC Rated Current - 0.6A Operation Mode Normally Closed Power Consumption - 8W Pressure - 0.02- 0.8Mpa Filtering capabilities Removable cleaning filtration devices Energized forms -mIntermittent Inlet and outlet Dimeter - 1/2" (outer diameter) hose Dimensions (mm) LxWxH - 80 x 88 x 50 Weight (gm) -100</p>	3

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