**Unmanned Ground Vehicle (wheeled or tracked) (Quantity – 1)**

**Specifications:**

The robot should meet all the mentioned specifications, terms and conditions, unless otherwise mentioned.

1. **Robot and Controller:**

| | |
|---|---|
| Size<br>Length<br>Width<br>Height | <br>Minimum 0.50 m<br>Minimum 0.40 m<br>Minimum 0.25 m |
| Payload | Minimum 15 kg |
| Max. speed | Maximum 2.0m/s |
| Power | Less than 600W |
| Weight including sensors and actuators | Maximum 20Kg |
| Embedded board | OpenCR (Open-source Control module for ROS) |
| SBC (Single Board Computers) | Raspberry Pi 3 Model B or B+ |
| MCU | 32-bit ARM Cortex® |
| Remote Controller | Bluetooth communication (optional) |

2. **Power supply and ports:**

| | |
|---|---|
| Battery Type | Lithium polymer |
| Operating time | Minimum 2 hours |
| Charging Time | Maximum 2.30 hours (for full charge) |
| Power connectors | 3.3V / 800mA 5V / 4A 12V / 1A |
| | |
| Programmable indicators | LEDs |
| Status indicators | Board status and Power status |
| PC connection | USB |
| Firmware upgrade | via USB / via JTAG |
| Power adapter (SMPS) | Input : 100-240V, AC 50/60Hz, 1.5A @max Output : 12V DC, 5A |

| | | |
|---|---|---|
| **CONTROL MODES** | Kinematic Commands — velocity, angular velocity<br>Open Loop Motor Driver Commands — voltage<br>Wheel Velocity Commands | |
| **FEEDBACK** | Battery and motor current Wheel velocity and travel | Integrated GPS receiver Integrated gyroscope and accelerometer |
| **COMMUNICATION** | Ethernet, USB 3.0, RS232. (IEEE 1394 available) | |
| **DRIVERS AND APIs** | Packaged with ROS Kinetic | |
| **INTEGRATED ACCESSORIES (included)** | Wireless Game controller, GPS, IMU, On-Board Computer, WIFI Adapter, Accessory Mounting Plates | |

**3. Optional accessories:**

| | |
|---|---|
| **1. LiDAR** | |
| Detection distance | Minimum 2000mm |
| Angular range | 360$^o$ |
| Angular resolution | 1$^o$ |
| **2. IMU** | |
| Gyroscope | 3 axis |
| Accelerometer | 3 axis |
| Magnetometer | 3 axis |

**Terms and conditions:**

1. All software packages (ROS Packages) and sample software programs (ready to program tasks) should be supplied with the robot.
2. The robot should be provided with SLAM (simultaneous localization and mapping) algorithms to build a map and can drive around your room.
3. The robot should have the provisions to mount other systems like manipulator, Kinect sensor
4. The structure of the robot should be rigid and free from vibrations.
5. The robot should be fitted with all electrical items to carryout work immediately.
6. The operation and maintenance manuals of the robot have to be supplied.
7. All necessary and suitable accessories such as brackets, plates, wheels, cables, fasteners, casters, batteries, motors, boards etc., should be included.

Should provide at least 3 years warranty

Vendor eligibility criteria (same as mentioned for item II)

Installation/Commission – yes

AMC - No

Scope of work: For outdoor applications with smooth and rough terrain