Q1: The military is developing an autonomous robot named "ScoutBot" to provide critical support to soldiers during field operations. ScoutBot will operate in rugged, remote, and potentially hostile environments, assisting soldiers with real-time surveying and patrolling, threat detection, and on-demand supply delivery. It is designed to enhance mission effectiveness while prioritizing soldier safety. Further details about the ScoutBot are as follows:

ScoutBot must autonomously navigate two terrains (namely forests and deserts) by detecting obstacles and avoiding collisions. The bot will provide live video and audio feeds to the command center with a minimum resolution of 720p, allowing real-time monitoring of surroundings. Additionally, ScoutBot is responsible for detecting threats, such as mines or hazardous materials. On detection of a threat the bot will alert the command center. ScoutBot will also act as a supply bot, capable of delivering essential items such as ammunition and medical kits upon request. Once delivered, the robot must confirm receipt with the requesting soldier to ensure the item reaches its intended recipient. To ensure secure communication, ScoutBot must use encrypted channels adhering to military-grade security standards. For operational resilience, it must function in extreme temperatures, ranging from -20°C to 50°C. ScoutBot's battery life is critical and should last at least 24 hours; the bot should provide low-battery notifications when power drops below 20%. For stealth operations, ScoutBot should operate quietly, maintaining noise levels under 20 decibels to avoid detection. Finally, ScoutBot must be serviceable in the field; it should be designed with modular components that allow soldiers to perform basic maintenance and repairs using standard military tools.

To Do: Identify and list 5 functional requirements and 5 non-functional requirements for ScoutBot. All requirements should be testable and follow a standard format with hierarchical numbering.