Luma Bot - AI Integrated Robot

Software Test Report

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In partial fulfilment of the requirements for the degree of Bachelor of Science in Artificial Intelligence 2025.

Faculty of Engineering Sciences and Technology
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Software Test Plan and Test Cases

Project Name: Luma Bot - AI Integrated Robot

Date: July 1st, 2025

Version: 1.0

Software Test Plan
The following table describes the test plan and schedule for each screen/module of Luma Bot Integrated Robot

Test Plan Schedule

S. No	Module	Assigned To	Start Date	End Date
1	ESP32 Board Boot Test	Rayyan	06-Jul-25	06-Jul-25
2	ESP32-CAM Camera Functionality	Asad	06-Jul-25	06-Jul-25
3	Motor Movement Test	Ibtesam	04-Jul-25	07-Jul-25
4	Obstacle Avoidance with Sensors	Rayyan	03-Jul-25	05-Jul-25
5	Vacuum System Operation	Asad	04-Jul-25	06-Jul-25

Test Case 1: ESP32 Boot Test

Test ID: ESP32-BOOT

Engineer: Rayyan

Step	Input	Expected Result	Actual Result	Pass/Fail
Power on ESP32	Battery or USB	Red LED turns on, board boots	As Expected	✓ Pass
Upload code via Arduino IDE	Blink/test code	Upload successful, program starts	As Expected	✓ Pass
Observe serial monitor	USB connection	Shows output logs	As Expected	✓ Pass

Test Case 2: ESP32-CAM Camera Check

Test ID: CAM-BASIC

Engineer: Asad

Step	Input	Expected Result	Actual Result	Pass/Fail
Power ESP32-CAM	5V source	Camera module powers on	As Expected	✓ Pass
Load camera test sketch	CameraWebServer.ino	Serial monitor shows IP stream	As Expected	✓ Pass
Open camera stream (optional)	IP address (if used)	Live video stream shows image	As Expected	✓ Pass

Test Case 3: Motor Movement (Manual Control)

Test ID: MOTOR-MOVE

Engineer: Ibtesam

Step	Input	Expected Result	Actual Result	Pass/Fail
Power L298N + Motors	12V battery	Motors connected	As Expected	✓ Pass
Upload motor test code	Arduino sketch	Motors spin forward/backward	As Expected	✓ Pass
Check all directions	Left, right, rotate	All movement directions verified	As Expected	✓ Pass

Test Case 4: Obstacle Avoidance via Ultrasonic Sensors

Test ID: OBSTACLE-AVOID

Engineer: Rayyan

Step	Input	Expected Result	Actual Result	Pass/Fail
Connect ultrasonic sensors	VCC, GND, Trig, Echo	Sensors respond with distance	As Expected	✓ Pass
Place object at 20cm	Any wall/box	Robot stops or reroutes	As Expected	✓ Pass
Remove obstacle	Clear path	Robot resumes movement	As Expected	✓ Pass

Test Case 5: Vacuum System Test

Test ID: VAC-TEST

Engineer: Asad

Step	Input	Expected Result	Actual Result	Pass/Fail
Power on vacuum motor	Manual switch or code	Vacuum fan starts spinning	As Expected	✓ Pass
Place paper/debris	Small wrapper	Vacuum sucks debris into chamber	As Expected	✓ Pass
Continuous running test	1–2 minutes run	No overheating or power drop	As Expected	✓ Pass