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**CSE461**

Section : 12

Group : 03

Semester : Summer\_2025

**Robot Project Proposal**

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Submission Date:05-08-2025

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**Project Idea 1**

**1. Project Title: Transistor Tester using Arduino Uno**

**2. Purpose**

**Objective :** Build the tester hardware on a breadboard using minimal, common components.

**Scope:** Detects component type and measures characteristics such as resistance, capacitance, inductance and more.

**Significance:** Alternative to commercial component testers.

**3. Components**

* Microcontroller:Arduino Uno
* Actuators:
  + 16\*2 LCD Display
  + LED
  + Push Button
* Body/Chassis: Breadboard
* Additional Components : Resistor, IC, Jumperwires, Battery

**4. Cost Breakdown**

| **No** | **Components** | **Quantity** | **Unit Cost (BDT)** | **Total Cost (BDT)** |
| --- | --- | --- | --- | --- |
| 1 | Arduino Uno | 1 | 1043/- | 1043/- |
| 2 | 16\*2 LCD Display | 1 | 350/- | 350/- |
| 3 | Different Transistor | 15/20 |  | 200/- |
| 4 | BreadBoard | 1 | 100/- | 100/- |
| 5 | Push Button & LED | 1 | 50/- | 50/- |
| 6 | Wires | 2 | 170/- | 170- |
| **Total Cost (BDT)** | | | | 1913/- |

**5. Functionality Breakdown**

Functionality 1: Component Detection

* Overview: Identify the type of electronic component connected such as transistor, diode, resistor, capacitor, etc.
* Working: Arduino applies test signals and analyzes the response to determine the component type.

Functionality 2: Pinout Identification

* Overview: Find the correct pin configuration of the tested component.
* Working: The Arduino systematically switches test points, measures responses, and assigns roles.

Functionality 3: Parameter Measurement

* Overview: Measure electrical values of the component.
* Working: The system calculates values such as resistance, capacitance, inductance and then displays them on the LCD.

**6. Potential Challenges**

* **Technical:** Calibration and noise can affect measurement accuracy.
* **Design:** Wiring complexity may cause unstable connections.
* **Integration:** Managing detection, measurement, and display together.