**Temperature Monitoring System**

Components for Temperature Monitoring System:-

**1. Temperature Sensor:**

Type: PT100 or PT1000 RTD (Resistance Temperature Detector) sensor

Specifications: Measures temperature accurately over a wide range, typically from -200°C to +600°C.

Usage: Converts temperature into an electrical signal that can be interpreted by the monitoring system.

Price: Approximately ₹500 to ₹1500 depending on the quality and specifications.

**2. Signal Conditioning Module:**

Type: Analog to Digital Converter (ADC) module

Specifications: Converts analog signals from PT100/PT1000 sensors into digital signals for processing.

Usage Interfaces between the sensor and the microcontroller to ensure accurate data acquisition.

Price: Around ₹1000 to ₹3000 depending on the number of channels and precision.

**3. Microcontroller:**

Type: Arduino or ESP32 microcontroller board

Specifications: Typically operates at 5V, has analog and digital input/output pins, and capable of processing sensor data.

Usage: Controls the temperature monitoring system, processes data, and sends it to a display or a remote system.

Price: ₹500 to ₹2000 depending on the model and features.

**4. Display Unit:**

Type: LCD Display (16x2 or 20x4 characters)

Specifications: Shows temperature readings and possibly other system parameters.

Usage: Provides real-time information to operators about the boiler temperature.

Price: Approximately ₹300 to ₹800 depending on size and quality.

**5. Communication Module:**

Type: Wi-Fi or Ethernet Module (e.g., ESP8266, ESP32 with Wi-Fi)

Specifications: Enables connectivity to a local network or the internet for remote monitoring.

Usage: Transmits temperature data to a centralized monitoring system or cloud server.

Price: ₹500 to ₹1500 depending on the module type and features.

**6. Power Supply:**

Type: DC Power Adapter (5V or 12V)

Specifications: Provides stable power to the microcontroller and sensor modules.

Usage: Ensures continuous operation of the temperature monitoring system.

Price: ₹200 to ₹500 depending on the power rating and quality.

**Component Prices:**

- PT100 Temperature Sensor: ₹1000

- ADC Module: ₹2000

- Arduino Uno Microcontroller: ₹1000

- 16x2 LCD Display: ₹500

- ESP32 Wi-Fi Module: ₹1200

- DC Power Adapter: ₹300