## HARDWARE

List of Hardware Components

| COMPONENTS | QUANTITY | COST PER ITEM(RS) |
|---|---|---|
| Heartbeat Sensor | 1 | 135 |
| LM35 | 1 | 49 |
| Arduino | 1 | 490 |
| Breadboard | 1 | 68 |
| LCD 16x2 | 1 | 88 |
| LED (Red) | 1 | 59 |
| Resistor | 1 | 1 |
| Resistor | 1 | 1 |
| Buzzer | 1 | 59 |
| Potentiometer | 1 | 25 |

### HEART RATE SENSOR

Heart rate sensor is a heart beat detecting and biometric pulse rate sensor. It is based on the principle of photoplethysmography and it consists of a light-emitting diode and a detector like a light detecting resistor or a photodiode. Its operating voltage range is +5V or 3.3V. This is a plug and play type of a sensor with current utilization of 4 mA. This sensor includes two circuits like optical amplifying & noise eliminating.

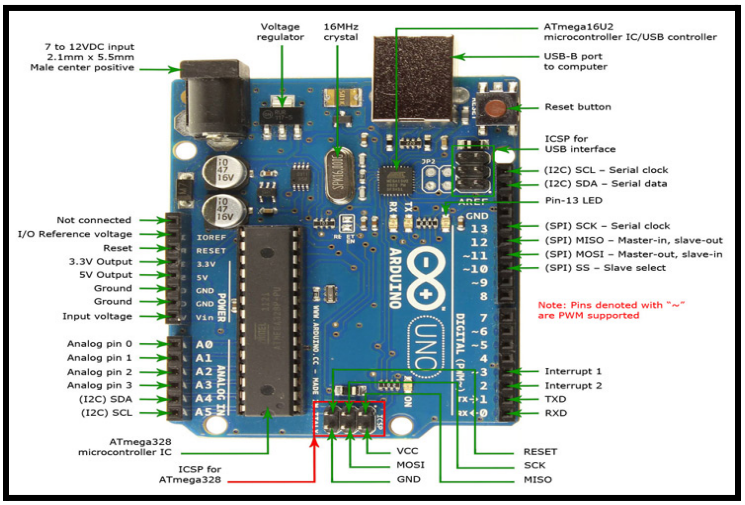
### LM35

It is a precession integrated circuit temperature sensor. It gives readings in degrees celsius since its output voltage is linearly proportional to temperature. As temperature increases the voltage across the diode increases at a known rate and output voltage varies with the temperature. There will be an increase by 10 millivolts for a rise of every 1°C and it can range from -55 degree Celsius to 150 degree Celsius and in terms of volts, it can range from minus 1 volts to 6 volts. If

the temperature is zero the voltage will be zero as well and output voltage can be converted into temperature using the formula. Vout = 10mv/°C * T

This is the brief description of Arduino.

Arduino Uno is a microcontroller board based on an 8-bit ATmega328P microcontroller. Along with ATmega328P, it consists of other components such as crystal oscillator, serial communication, voltage regulator, etc. to support the microcontroller. Arduino Uno has 14 digital input/output pins (out of which 6 can be used as PWM outputs), 6 analog input pins, a USB connection, A Power barrel jack, an ICSP header and a reset button.




Pin Diagram of Arduino Uno

Technical Specifications of Arduino Uno

| Sr.No | Components | Specifications |
|---|---|---|
| 1. | Microcontroller | ATmega328P – 8 bit AVR family microcontroller |
| 2. | Operating Voltage | 5V |
| 3. | Recommended Input Voltage | 7-12V |
| 4. | Input Voltage Limits | 6-20V |
| 5. | Analog Input Pins | 6 (A0 – A5) |
| 6. | Digital I/O Pins | 14 (Out of which 6 provide PWM output) |

| | | |
|---|---|---|
| 7. | DC Current on I/O Pins | 40 mA |
| 8. | DC Current on 3.3V Pin | 50 mA |
| 9. | Flash Memory | 32 KB (0.5 KB is used for Bootloader) |
| 10. | SRAM | 2 KB |
| 11. | EEPROM | 1 KB |
| 12. | Frequency (Clock Speed) | 16 MHz |