**INDEX**

|  |  |  |
| --- | --- | --- |
| **Chapter No.** | **TOPIC** | **Page No.** |
|  | **LIST OF FIGURES LIST OF TABLES**  **ABSTRACT** | **VI-VII VIII**  **IX** |
| **1** | **INTRODUCTION** | **1-3** |
| 1.1 | What is this project about? | 1 |
| 1.2 | Why choose this project? | 2 |
| 1.3 | Usefulness to the society | 2 |
| 1.4 | Brief thesis on each chapter | 2 |
| **2** | **LITERATURE SURVEY** | **4-14** |
| **3** | **BLOCK DIAGRAM** | **15-16** |
| **4** | **HARDWARE COMPONENTS** | **17-62** |
| **4.1** | **ARDUINO UNO** | **17-22** |
| 4.1.1 | Specifications of Arduino Uno | 18 |
| 4.1.2 | Features of Arduino Uno | 19 |
| 4.1.3 | Use of Arduino Uno in this project | 20 |
| 4.1.4 | Why Arduino? | 20 |
| 4.1.5 | Working Principle | 20 |
| 4.1.6 | Pin Diagram | 20-21 |
| 4.1.7 | Pin Description | 22 |
| **4.2** | **WIFI IOT MODULE** | **22-29** |
| 4.2.1 | Internet Of Things (IOT) | 23 |
| 4.2.2 | Description | 24 |
| 4.2.3 | Product Contents | 24 |
| 4.2.4 | Features of IOT Module ESP8266 | 24 |
| 4.2.5 | Specifications of IOT Module ESP8266 | 25 |

|  |  |  |
| --- | --- | --- |
| 4.2.6 | Use of IOT Module ESP8266 in project | 25 |
| 4.2.7 | Why IOT Module ESP8266? | 25-26 |
| 4.2.8 | Working Principle | 26 |
| 4.2.9 | Pin Diagram | 27 |
| 4.2.10 | Connecting the Hardware to Our ESP8266 | 28 |
| 4.2.11 | ESP8266-01 Boot Option | 28 |
| 4.2.12 | Interfacing Diagram Of Wifi IOT Module | 29 |
| **4.3** | **Power Supply** | **30-33** |
| 4.3.1 | Transformer | 30 |
| 4.3.2 | Rectifier | 30 |
| 4.3.3 | Bridge Rectifier | 31-32 |
| 4.3.4 | Voltage Regulators | 32 |
| 4.3.5 | Features | 33 |
| 4.3.6 | Working Principle | 33 |
| **4.4** | **LIQUID CRYSTAL DISPLAY (LCD)** | **34-44** |
| 4.4.1 | Specifications of LCD | 35 |
| 4.4.2 | Features of LCD | 36 |
| 4.4.3 | Pin Configuration | 37-38 |
| 4.4.4 | Pin Diagram | 38 |
| 4.4.5 | Working Principle Interface Diagram of LCD | 39 |
| 4.4.6 | Use of LCD in this project | 40 |
| 4.4.7 | Why LCD ? | 40-42 |
| 4.4.8 | List of Command | 43 |
| 4.4.9 | Interfacing of LCD With Aduino | 44 |
| **4.5** | **GSM (GLOBAL SYSTEM FOR MOBILE)** | **45-53** |
| 4.5.1 | Features | 46 |
| 4.5.2 | Pin Configuration | 47-49 |
| 4.5.3 | Pin Diagram | 49 |

|  |  |  |
| --- | --- | --- |
| 4.5.4 | Specifications and Characteristics for GSM | 49-50 |
| 4.5.5 | Use of GSM in Our Project | 50 |
| 4.5.6 | Why Only GSM? | 50-51 |
| 4.5.7 | Working Principle | 51-52 |
| 4.5.8 | Interfacing of GSM With Arduino | 53 |
| **4.6** | **PH SENSORS** | **54-62** |
| 4.6.1 | What Is PH | 54 |
| 4.6.2 | Why Monitor the pH of Water Pin Diagram | 54-55 |
| 4.6.3 | MEASUREMENT OVERVIEW Pin Description | 55 |
| 4.6.4 | Features | 55 |
| 4.6.5 | Specification Of PH | 56 |
| 4.6.6 | Use of PH Sensor in Our Project | 57 |
| 4.6.7 | Working Principle | 57 |
| 4.6.8 | Interface Diagram of PH With Arduino | 57 |
| **4.7** | **Turbidity** | **58-62** |
| 4.7.1 | What is Turbidity | 58 |
| 4.7.2 | Impact of Turbidity | 58 |
| 4.7.3 | Use Of Turbidity Sensor in Project | 58 |
| 4.7.4 | Why Only Turbidity Sensor | 58-59 |
| 4.7.5 | Specifications | 59 |
| 4.7.6 | Features | 59 |
| 4.7.7 | Measuring Turbidity | 59 |
| 4.7.8 | Working Principle | 60-62 |
| 4.7.9 | Interfacing Diagram of Turbidity Sensor with Aurdino | 62 |

|  |  |  |
| --- | --- | --- |
| **5** | **CIRCUIT DIAGRAM AND EXPLANATION** | **63-64** |
| 5.1 | Circuit Diagram | 63 |
| 5.2 | Explanation | 64 |
| **6** | **SOFTWARE SECTION** | **65-72** |
| 6.1 | Arduino Integrated Development Environment | 65-70 |
| 6.2 | Flow Chart | 71 |
| 6.2.1 | Flow Chart Explanation | 72 |
| **7** | **RESULTS** | **73-74** |
| **8** | **ADVANTAGES & APPLICATIONS** | **75** |
| 8.1 | Advantages | 75 |
| 8.2 | Applications | 75 |
| **9** | **CONCLUSION & FURTURE SCOPE** | **76** |
| 9.1 | Conclusion | 76 |
| 9.2 | Future Scope | 76 |
|  | **APPENDICES**  **APPENDIX-A:CODE**  **APPENDIX-B:REFERENCES**  **APPENDIX-C:BIOGRAPHY** | **77-83**  **77-81**  **82-83**  **83** |

**LIST OF FIGURES**

|  |  |  |
| --- | --- | --- |
| **S.NO** | **FIGURE NAME** | **PAGE NO** |
| Fig 1.1 | Water pollution | 1 |
| Fig 1.2 | water Testing | 2 |
| Fig 3.1 | Block Diagram | 15 |
| Fig 4.1 | Arduino UNO Atmega328p | 17 |
| Fig 4.2 | Atmega 328P pin diagram | 20 |
| Fig 4.3 | IOT Device Life Cycle | 23 |
| Fig 4.4 | Front view of WIFI Module | 26 |
| Fig 4.5 | Rear View of WIFI Module | 26 |
| Fig 4.6 | Pin diagram of ESP8266 | 27 |
| Fig 4.7 | ESP8266 sending data to web page | 28 |
| Fig 4.8 | Interfacing Diagram | 29 |
| Fig 4.9 | Block Diagram Of Power Supply | 30 |
| Fig 4.10 | Bridge Rectifier | 31 |
| Fig 4.11 | Output Waveform Of DC | 31 |
| Fig 4.12 | Regulator | 32 |
| Fig 4.13 | Circuit Diagram Of Power Supply | 33 |
| Fig 4.14 | LCD | 34 |
| Fig 4.15 | Pin diagram of LCD | 38 |
| Fig 4.16 | Working Principle of LCD | 39 |
| Fig 4.17 | Layers of LCD | 39 |
| Fig 4.18 | Interfacing Diagram | 44 |
| Fig 4.19 | SIM 900A Pin Diagram | 49 |
| Fig 4.20 | GSM Module | 50 |
| Fig 4.21 | Interfacing diagram | 53 |
| Fig 4.22 | PH Scale | 54 |
| Fig 4.23 | PH Sensor | 56 |
| Fig 4.24 | Interfacing Diagram | 57 |
| Fig 4.25 | Turbidity | 58 |
| Fig 4.26 | Internal diagram | 60 |
| Fig 4.27 | TSD-10 | 60 |
| Fig 4.28 | circuit diagram | 60 |
| Fig 4.29 | Working Principle | 61 |
| Fig 4.30 | Reflection of light in water | 61 |
| Fig 4.31 | Voltage VS Turbidity Graph | 61 |
| Fig 4.32 | Turbidity sensor | 62 |
| Fig 4.33 | SUK SEN 0189 | 62 |
| Fig 4.34 | Interfacing Diagram | 62 |
| Fig 5.1 | Circuit Diagram | 63 |
| Fig 6.1 | software setup | 65 |
| Fig 6.2 | Screen shot | 67 |
| Fig 6.3 | Flow chart | 71 |
| Fig 7.1 | WIFI initialization | 73 |
| Fig 7.2 | WIFI is connected to the device | 73 |
| Fig 7.3 | Water status in TCP Client app | 73 |
| Fig 7.4 | PH value | 74 |
| Fig 7.5 | Turbidity value | 74 |
| Fig 7.6 | Entire kit connection. | 74 |

**LIST OF TABLES**

|  |  |  |
| --- | --- | --- |
| **TABLE NO** | **TABLE NAME** | **PAGE NO** |
| Table-1 | Paper work of the authors | 4 |
| Table-2 | Specifications of Arduino | 18 |
| Table-3 | Features | 19 |
| Table-4 | Pin Description of Arduino | 22 |
| Table-5 | Pin diagram of wifi iot module | 27 |
| Table-6 | ESP8266-01 BOOT OPTION | 28 |
| Table-7 | Pin Description of LCD | 37 |
| Table-8 | LCD Command Description | 42 |
| Table-9 | Commands and Instructions for LCD | 43 |
| Table-10 | Configuration of SIM 900A | 47-49 |
| Table-11 | Specifications | 56 |
| Table-12 | Specifications | 59 |

**ABSTRACT:**

Now a days many people are suffering from dangerous diseases which are caused due to impure water. In our project we are doing analysis for water quality monitoring system, it gives data about the quality of water, on a web page. The quality of water is determined using various sensors like PH sensor and turbidity sensor, connected to the Arduino family micro-controller. The Arduino software is written in embedded C and GSM module is connected to the Arduino. The data will be transferred constantly from the remote sensor organize through micro-controller and Wi-Fi. Wi-Fi module is used to send data to the web page via internet which is connected to the micro-controller. The total data regarding the purity of water is displayed in the web page and is analyzed in the form of graph, pie chart and values are given in the table. We transfer this information to cloud and clients can get to this information through web page application, client from anyplace can screen the data whenever.