**LIST OF FIGURES**

|  |  |  |
| --- | --- | --- |
| **FIGURE NO.** | **TITLE** | **PAGE NO.** |
| 3.1 | Runoff plot | 14 |
| 3.2 | Dimension measurement of runoff collection tank | 15 |
| 3.3 | Arduino Mega 2560 | 19 |
| 3.4 | NodeMCU | 22 |
| 3.5 | HC-SR04 | 26 |
| 3.6 | Breadboard with interconnection | 28 |
| 3.7 | Jumper wire | 29 |
| 3.8 | Single core wire | 29 |
| 3.9 | Circuit diagram of smart runoff measurement system | 31 |
| 3.10 | Arduino IDE software | 32 |
| 3.11 | I2C serial communication | 35 |
| 3.12 | Working of I2C | 36 |
| 3.13 | I2C serial communication bus | 37 |
| 3.14 | Solar panel | 42 |
| 3.15 | Solar battery | 43 |
| 3.16 | Solar charge controller | 44 |
| 3.17 | Connection diagram for Solar PV system | 46 |
| 4.1 | Flow chart of working of smart runoff measurement system | 50 |
| 4.2 | Manual measure and sensor measure runoff depth using Newping Library | 52 |
| 4.3 | Manual measure and sensor measure runoff depth using Newping Library and Iteration method | 53 |
| 4.4 | Manual measure and sensor measure runoff depth using Newping Library and temperature effect equation method | 55 |
| 4.5 | Thingspeak basics and account setup | 56 |
| 4.6 | Smart runoff measurement system channel in Thingspeak | 57 |
| 4.7 | Data downloading page | 58 |
| 4.8 | Sample calculation of downloaded data and generated hydrograph | 59 |