

Department of Electrical Engineering

**DEC 50132 – INTERNET BASED CONTROLLER**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **PROGRAMME** | | **:** | |  | | | |
| **PRACTICAL WORK NO** | | **:** | | **6** | | | |
| **TITLE** | | **:** | | **SIMPLE IOT APPLICATION FOR MONITORING SENSOR READING WITH NODE-RED DASHBOARD** | | | |
| **DATE** | | **:** | |  | | | |
| **LECTURER NAME** | | **:** | |  | | | |
|  | |  | |  | | | |
| **PRACTICAL SKILL ASSESSMENT**  **[CLO2, PLO5, P4]** | | **ATTAINMENT** | | | **LAB REPORT ASSESSMENT** | **ATTAINMENT** | |
| PBL- Able to draw the node flow and deploy the node-red and broker without supervision  (weightage x 2) | | S1 |       | | **Results**  **Discussion**  **Conclusion** |                     | |
| S2 |       | |
| S3 |       | |
| S4 |       | |
| PBL- Able to establish connection to the broker from MQTTbox/ IOT MQTT panel | | S1 |       | |
| S2 |       | |
| S3 |       | |
| S4 |       | |
| PBL- Able to code using Arduino IDE (weightage x 2) | | S1 |       | | **Score (30)** |  | |
| S2 |       | |
| S3 |       | |
| S4 |       | |
| Score (50) | | S1 |  | | **Percentage (30%)** |  | |
| S2 |  | |
| S3 |  | |
| S4 |  | |
| **Percentage (70%)** | | S1 |  | | **Total CA Marks (100%)** | S1 |  |
| S2 |  | | S2 |  |
| S3 |  | | S3 |  |
| S4 |  | | S4 |  |
| **BIL** | **GROUP MEMBERS** | | | | **REGISTRATION NO.** | | |
| S1 | CHONG KHENG CHEN | | | | 03DET22F1043 | | |
| S2 |  | | | |  | | |
| S3 |  | | | |  | | |
| S4 |  | | | |  | | |

**PRACTICAL SKILL RUBRIC (PLO2,LD2)**

|  |  |
| --- | --- |
| **Score** | **Description** |
| 10 | Student can **complete all** tasks assigned **WITHOUT** errors/ supervision |
| 8 | Student can **complete all** tasks assigned with **A FEW** errors/ supervision |
| 6 | Student can **complete all** tasks assigned with **MORE** errors / supervision |
| 4 | Student can **complete partial** tasks assigned **WITHOUT** errors / supervision |
| 2 | Student can **complete partial** tasks assigned with **A FEW** errors / supervision |
| 0 | Student shows no response/task not attempted |

**LAB REPORT RUBRIC**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Report Component (PLO2,LD2)** | **Excellent** | **Very Good** | **Good** | **Fair** | **Unsatisfactory** |
| **5** | **4** | **3** | **2** | **1** |
| **Results**  • Results in the form of data, calculation, waveform, graph etc. | Professional looking and accurate representation of the data in tables and/or graphs. Graphs and tables are labeled and titled. | Accurate representation of the data in tables and/or graphs. | Accurate representations of the data in written form, but no graphs or tables are presented. | Incomplete result, major mistakes. | Data are not shown OR are inaccurate. |
| **Analysis/ Discussion**  • Ability to present, interpret and analyze result. | All point of discussion on the results obtained covered and elaborated. | Most points of discussion on results obtained covered and elaborated. | Some points of discussion on results obtained covered and elaborated. | Some points of discussion on results obtained covered and but not properly elaborated. | Very few points of discussion, not properly elaborated. |
| **Conclusion** • Provide answers to  objectives stated  earlier. • Ability to learn  something from the experiment. | Conclusion includes whether the findings supported the hypothesis, possible sources of error, and what was learned from the experiment. | The closing paragraph summarizes and draws a sufficient conclusion. | The closing paragraph attempts to summarize but draws a weak conclusion. | The closing paragraph do not attempts to summarize the experiment OR shows little effort and reflection. | No conclusion was included in the report. |

**Practical Work 6**

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| --- | --- | --- |
| |  | | --- | | Problem Based Learning |   Based on all the steps above and the previous Practical Work 5, use your understanding to get the output in your node-red dashboard and Android or IOS IOT MQTT Panel to control lamp and fan in your house. The interface in Node-red dashboard and IOS IOT MQTT Panel is shown below:  **Result:**   |  | | --- | | Observations and Problem based Learning code:  Task 1      Task 2          Task 3  FGJY5J        PBL |   **Discussion:**  In short, the Internet-based controller system with Node-RED, MQTT, and Android MQTT offers streamlined remote device control. Node-RED's visual programming simplifies integration, MQTT enables efficient communication with mobile devices, and scalability is ensured. However, security measures are crucial to address potential vulnerabilities, and network optimization techniques like QoS settings enhance reliability. With proper precautions, this system enhances automation and accessibility effectively.  **Conclusion:**  The Internet-based controller system incorporating Node-RED, MQTT, and Android MQTT represents a pivotal advancement in remote device management, offering seamless integration and accessibility through visual programming and mobile control capabilities. Its scalability and modularity ensure adaptability to evolving needs, yet persistent security concerns necessitate robust measures to safeguard against potential breaches. Moreover, optimizing network stability with techniques like QoS settings enhances reliability, paving the way for broader adoption across industries and facilitating innovative solutions to real-world challenges in IoT environments. |