**ASSESSMENT 12**

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| **Date:** | 30-05-2020 | **Name:** | Sheela Golasangi |
| **Course:** | Logic Design | **USN:** | 4AL16EC068 |
| **Topic:** | Applications of Programmable Logic Controllers. | **Semester & Section:** | VIII  ‘B’ |
| **Github Repository:** | Sheela - Course |  |  |

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| **FORENOON SESSION DETAILS** |
| **Image of the session**  **C:\Users\india\Pictures\Screenshots\Screenshot (364).pngC:\Users\india\Pictures\Screenshots\Screenshot (370).png** |
| **REPORT**  **Applications of Programmable Logic Controllers**   * **An Introduction to Programmable Logic Controllers (PLC)**   PLC is the major components in industrial control systems they will place something electromagnetic relays. In this he discussed about relays to bits, basically making transaction from relays to bits and memory. Example is shown in below figure.  C:\Users\india\Pictures\Screenshots\Screenshot (363).png   * **What is PLC?**   A **Programmable Logic Controller**, also called a **PLC** or programmable controller, is a computer-type device used to control equipment in an industrial facility.  The kinds of equipment that PLCs can control are as varied as industrial facilities themselves. Utility Plants, Batch Control Application, Chemical Processing, Conveyor systems, food processing machinery, auto assembly lines etc…you name it and there’s probably a PLC out there controlling it.  **Programmable Logic Controller (PLC)**  Programmable Logic Controller  In a traditional industrial control system, all control devices are wired directly to each other according to how the system is supposed to operate. In a PLC system, however, the PLC replaces the wiring between the devices.  Thus, instead of being wired directly to each other, all equipment is wired to the PLC. Then, the control program inside the PLC provides the “wiring” connection between the devices.  The control program is the computer program stored in the PLC’s memory that tells the PLC what’s supposed to be going on in the system. The use of a PLC to provide the wiring connections between system devices is called softwiring.   * **Relay Diagram**   **C:\Users\india\Pictures\Screenshots\Screenshot (366).png**   * Operator Interface: * SPST Switch * Red indicator * Green indicator * Power Source: * Alternating Current * Direct Current (5v, 15v, 25v,…to control the other devices) * Control Circuit: * Single pole and single switch. * 15vac, 12vdc, which includes context from the relay. * **PLC Advantages**   In addition to the programming flexibility we just mentioned, PLCs offer other advantages over traditional control systems.  These advantages include:   * high reliability * small space requirements * computing capabilities * reduced costs * ability to withstand harsh environments * expandability * It is time for a small transition in how the contacts are designed. * Rotates a common contact between the normally closed and the normally cosed and the normally open. * Pulls a shorting bar between the normally closed and the normally open contacts.   C:\Users\india\Pictures\Screenshots\Screenshot (368).png  **Numeric Solenoid:**  **C:\Users\india\Pictures\Screenshots\Screenshot (372).png**  **C:\Users\india\Pictures\Screenshots\Screenshot (374).png**  **C:\Users\india\Pictures\Screenshots\Screenshot (375).png**  In the early days of PLCs, processor speed and memory were too limited to support anything but discrete (on/off) control functions.  Consequently, the only I/O capability found on early PLCs were discrete in nature. Modern PLC technology, though, is powerful enough to support the measurement, processing, and output of analog (continuously variable) signals.  All PLCs are digital devices at heart. Thus, in order to interface with an analog sensor or control device, some “translation” is necessary between the analog and digital worlds. Inside every analog input module is an ADC, or Analog-to-Digital Converter, circuit designed to convert an analog electrical signal into a multi-bit binary word.  Conversely, every analog output module contains a DAC, or Digital-to-Analog Converter, circuit to convert the PLC’s digital command words into analog electrical quantities.  **Analog I/O is commonly available for modular PLCs for many different analog signal types, including:**   * Voltage (0 to 10 volt, 0 to 5 volt) * Current (0 to 20 mA, 4 to 20 mA) * Thermocouple (millivoltage) * RTD * Strain Guage  PLC Analog I/O The following photographs show two analog I/O cards for an Allen-Bradley SLC 500 modular PLC system, an analog input card and an analog output card. Labels on the terminal cover doors indicate screw terminal assignments:  PLC analog output card ****PLC Network I/O**** Many different digital network standards exist for PLCs to communicate with, from PLC to PLC and between PLCs and field devices.  One of the earliest digital protocols developed for PLC communication was Modbus, originally for the Modicon brand of PLC.  Modbus was adopted by other PLC and industrial device manufacturers as a de facto standard, and remains perhaps the most universal digital protocol available for industrial digital devices today.  Another digital network standard developed by a particular manufacturer and later adopted as a de facto standard is Profibus, originally developed by Siemens. |