Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **14EI2044** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PLC AND AUTOMATION** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Discuss the different types of I/O circuits used in PLC I/O module. | CO1 | 14 |
| b. | Mention the advantages of PLC. | CO1 | 6 |
| **(OR)** | | | | |
| 2. | a. | Explain the Architecture of PLC with a neat diagram. | CO1 | 14 |
| b. | Enumerate the advantages of Programming Logic Controllers. | CO1 | 6 |
|  |  |  |  |  |
| 3. | a. | Draw the PLC Ladder diagram for the logic circuit given below. | CO1 | 10 |
| b. | Vividly explain the “Counter Function – UP/DOWN Counter” function of the PLC with example ladder logic. | CO3 | 10 |
| **(OR)** | | | | |
| 4. | a. | Draw a relay ladder and ladder logic program to start 3 motors using timer for the following conditions.  i) Start Motor 1 (oil pump motor) using short push button.  ii) Start Motor 2 after 10 seconds of Motor 1 starts.  iii) Start Motor 3 after 15 seconds of Motor 2 starts. | CO3 | 10 |
| b. | Vividly explain the “Timer Function – OFF delay Timer” function of the PLC with example ladder logic. | CO3 | 10 |
|  |  |  |  |  |
| 5. | a. | Explain in detail the operator interface. | CO2 | 14 |
| b. | Draw the display hierarchy showing different levels. | CO2 | 6 |
| **(OR)** | | | | |
| 6. | a. | Explain the operation of supervisory control and data acquisition system with neat diagram. | CO3 | 16 |
| b. | List out the differences between SCADA and PLC. | CO3 | 4 |
|  |  |  |  |  |
| 7. | a. | List the special features of CNC Machines. | CO2 | 10 |
| b. | In brief, discuss the benefits of Computer automated process planning. | CO2 | 10 |
| **(OR)** | | | | |
| 8. | a. | Draw the architecture of DCS and explain the function of each block in detail. | CO2 | 16 |
| b. | Outline the functions of engineering interface in DCS. | CO2 | 4 |
|  | | **Compulsory**: |  |  |
| 9. |  | With a neat diagram, explain the industrial robotics system using PLC. | CO3 | 20 |