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

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**End Semester Examination – Nov/Dec – 2017**

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

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

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Explain the Architecture of PLC with a neat diagram. | CO1 | 14 |
| b. | Draw the ladder diagram to activate the motor by pressing the start push button and deactivate the motor by stop button. | CO1 | 6 |
| (OR) | | | | |
| 2. | a. | What are the different types of I/O circuits used for PLC? Explain in detail. | CO2 | 10 |
| b. | Draw the PLC Ladder diagram for the logic circuit given below. | CO1 | 10 |
|  |  |  |  |  |
| 3. | a. | A parking plot has total capacity of 20 Cars. A “blue light” to be displayed if the number of cars available are less than 15, a “yellow light” to be displayed if the number of cars available are greater than or equal to 15 and less than 20 and a “Red light” to be displayed if the total capacity of parking plot is full. Assume that count of both incoming and outgoing cars are calculated using sensor used in the main entry. Implement this in PLC using Ladder Diagram programming language. | CO3 | 10 |
|  | b. | Draw a relay ladder and ladder logic program to start 3 motors using timer for the following conditions.   1. Start Motor 1 (oil pump motor) using short push button. 2. Start Motor 2 after 10 seconds of Motor 1 starts. 3. Start Motor 3 after 15 seconds of Motor 2 starts. | CO3 | 10 |
| (OR) | | | | |
| 4. | a. | Vividly explain in detail about the Timer functions in PLC with example ladder logic. Also mention advantages of PLC timer. | CO3 | 15 |
|  | b. | Draw the PLC Ladder diagram for the logic waveform given below using PLC timer function.  http://1.bp.blogspot.com/-cTMToIisMxA/UpweEjAbEkI/AAAAAAAAAYc/yzu8CRR0d0A/s400/ladder+8+dia.JPG | CO2 | 5 |
|  |  |  |  |  |
| 5. | a. | List out the Arithmetic functions and Number Comparison functions in PLC. Explain each instruction in detail with example ladder logic. | CO1 | 15 |
|  | b. | Draw the ladder logic to convert the recorded Celsius temperature in the data table to Fahrenheit values for display using the formula: F = ( 9/5 x C ) + 32.  Assume a current temperature reading of 60 °C and calculate the equivalent temperature in Fahrenheit. | CO1 | 5 |
| (OR) | | | | |
| 6. | a. | Explain in detail about the Jump functions in PLC with example ladder logic. | CO1 | 10 |
|  | b. | Vividly explain in detail about the PLC sequencer instruction with example ladder logic. Also mention advantages of sequencer instruction. | CO3 | 10 |
|  |  |  |  |  |
| 7. | a. | Name the LCU programming language alternatives. Explain any one in detail. | CO2 | 16 |
|  | b. | Mention the various types of Redundancy. | CO2 | 4 |
| (OR) | | | | |
| 8. | a. | Draw the architecture of DCS and explain the function of each block in detail. | CO2 | 16 |
|  | b. | List out the difference between SCADA and PLC. | CO2 | 4 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. |  | With the neat diagram, explain the industrial robotics system using PLC. | CO2 | 20 |

ALL THE BEST