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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14EI2012** | **Duration :** | **3hrs** |
| **Sub. Name :** | **LOGIC AND DISTRIBUTED CONTROL SYSTEMS** | **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. | With a clear block diagram distinguish between DAS and SCADA. | CO1 | 10 |
| b. | Explain briefly about different types of digital controller modes. | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | Explain in detail about Data Loggers with neat sketch. | CO1 | 10 |
| b. | List and explain the basic elements of DAQ system. | CO1 | 10 |
| 3. | a. | With the aid of neat block diagram, explain the architecture of a PLC system. | CO2 | 10 |
|  | b. | Explain Timer, Counter Instructions in PLC Ladder Diagram Programming Language withexamples. | CO2 | 10 |
| (OR) | | | | |
| 4. | a. | Develop a ladder programming for the sequential control using Timers. Lube-oil pump motor starter coil M1 is energized when the start pushbutton PB2 is momentarily actuated. As a result M1-1 control contact closes to seal in M1 and the lube-oil pump motor starts. When the lube-oil pump builds up sufficient oil pressure the lube-oil pressure switch PSl closes. This in turn energizes coil M2 to start the main drive motor and energizes coil l to begin the time-delay period. After the preset time-delay period of 15 s 1 TO-l contact closes to energize coil M3 and start the feed motor. | CO2 | 12 |
|  | b. | Design a PLC program that will execute the following control circuit: Turns on a timer when a switch is closed.  Timer is automatically reset by an input switch.  Counter counts the number of times the timer goes to 10 sec.  A second input switch at a count of 5 automatically resets the counter.  Latches on a light at the count of 5. | CO2 | 5 |
|  | c. | Develop a Ladder Programming for running a conveyor till it fills a container with 10 sealed bottles. | CO2 | 3 |
| 5. | a. | List the various data transfer instructions used in PLC programming. Explain with suitable examples. | CO2 | 10 |
|  | b. | List out PLC sequencer functions and explain any one of its function with process control application. | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | Write short notes on trouble shooting PLC malfunctions. | CO2 | 8 |
|  | b. | Describe basic two axis Robot with PLC sequencer control. | CO2 | 12 |
| 7. | a. | "Evolution of DCS is a remarkable mile stone in Automation" - Justify this statement. | CO3 | 5 |
|  | b. | Draw the architecture of DCS and explain the function of each block. | CO3 | 15 |
| (OR) | | | | |
| 8. | a. | Discuss about the LCU Architecture in distributed control system. | CO3 | 10 |
|  | b. | Sketch the block diagram of Local control unit and explain the functions of every block | CO3 | 10 |
|  | | **Compulsory:** |  |  |
| 9. | a. | What is the need of communication in DCS? Explain the standards adopted in the communication protocol. | CO3 | 15 |
|  | b. | Explain the function of an Operator Station Unit of a DCS. | CO3 | 5 |

ALL THE BEST