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– 2017**

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| **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. | Draw the block diagram of SCADA and explain each of its components. | CO1 | 10 |
| b. | Sketch the block diagram of Data Acquisition System (DAS) and explain the functions performed by the elements. | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | Explain in detail about Data Loggers with neat sketch. | CO1 | 10 |
| b. | Derive the expression for Digial PID controller using Position Algorithm. | CO1 | 10 |
|  |  |  |  |  |
| 3. | a. | Describe the architecture of PLC with a neat diagram. | CO2 | 15 |
|  | b. | Write short note on the execution cycle of PLC. | CO2 | 5 |
| (OR) | | | | |
| 4. | a. | Develop ladder program for the following counter specifications: Count the number of times a push button is closed, turn on a light any time the accumulated value of the counter is less than 20, reset the counter to zero when a selector switch is closed. | CO2 | 6 |
|  | b. | Develop PLC ladder diagram for the following application: a light to come ON when the sum of the counts from the two counters is equal to or greater than 350. A RESET button is provided to reset the accumulated count of both counters to zero. | CO2 | 7 |
|  | c. | Develop ladder logic for the following scenario.  A fan is to run only when all of the following conditions are met:  • Input A is OFF  • Input *8* is ON or input C is ON, or both 8 and ( are ON  • Inputs *D* and *E* are both ON  • One or more of inputs *F,* G, or *H* are ON | CO2 | 7 |
|  |  |  |  |  |
| 5. | a. | List the bit functions used in ladder diagram. Explain them with examples. | CO2 | 10 |
|  | b. | Explain how sequencer instruction can be used for controlling an automatic dishwasher. | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | Give a case study on bottle filling system using PLC also give the merits of the same over other embedded programming. | CO2 | 12 |
|  | b. | Explain the design of interlocks using PLC. | CO2 | 4 |
|  | c. | What is the use of Skip instruction how does it vary from Jump function? | CO2 | 4 |
|  |  |  |  |  |
| 7. | a. | Elaborate on the evolution of control technology. | CO3 | 15 |
|  | b. | List the requirements in the design of LCU. | CO3 | 5 |
| (OR) | | | | |
| 8. | a. | Describe the operation of DCS and LCU with necessary sketches. | CO3 | 15 |
|  | b. | Differentiate the high level and low level human interfaces. | CO3 | 5 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Can PLC and Computers be interfaced with DCS? If Yes elaborate on the techniques used to interface them. | CO3 | 12 |
|  | b. | Explain in detail about data highways. | CO3 | 8 |

ALL THE BEST