

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

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

**Course Code: AE401**

**Course Name: LOGIC & DISTRIBUTED CONTROL SYSTEM**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any two full questions, each carries 15 marks.*

- |   |   | Marks |
|---|---|-------|
| 1 | a) With a block diagram explain the different parts of a PLC?                                       | (10)  |
|   | b) Discuss any 5 data types used in PLC.  | (5)   |
| 2 | a) What is meant by Sequential Function Chart? Illustrate with an example?                          | (8)   |
|   | b) What is RS-232 Standard? How does it differ from RS-485?   | (7)   |
| 3 | a) Draw the Functional Block Diagram and Ladder program to implement AND, OR and counter operation. | (9)   |
|   | b) Explain the different types of registers in PLC?   | (6)   |

**PART B**

*Answer any two full questions, each carries 15 marks.*

- |   |  |      |
|---|--|------|
| 4 | a) List the basic blocks involved in computer controlled system and explain the same with flow chart of a temperature control process. | (10) |
|   | b) Describe about supervisory control systems with an example.   | (5)  |
| 5 | a) Explain the block diagram of Distributed Control system.  | (10) |
|   | b) Write notes on Local Control Unit   | (5)  |
| 6 | a) With block diagram explain the working of Direct Digital Control  | (8)  |
|   | b) Explain the functions of local and global highways in DCS   | (7)  |

**PART C**

*Answer any two full questions, each carries 20 marks.*

- |   |   |      |
|---|---|------|
| 7 | a) Explain the various operator interface requirement in DCS?             | (5)  |
|   | b) What are the guidelines for human factor in operator interface design? | (5)  |
|   | c) Explain the various low-level operator interfaces                      | (10) |
| 8 | a) Explain Hazard and operability study (HaZOp).                          | (10) |
|   | b) What is IEC61511 standard for Functional safety?                       | (5)  |
|   | c) What is Safety Integrity Level?  | (5)  |
| 9 | a) Which are the various high level interface architectures in DCS?       | (10) |
|   | b) What is Process Hazard Analysis?                                       | (5)  |
|   | c) Define safety life cycle.  | (5)  |

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