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

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Fifth Semester B.Tech Degree Regular and Supplementary Examination December 2020



**Course Code: MR305**

**Course Name: PLC AND DATA ACQUISITION SYSTEMS**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 5 marks.*

- 1 What are data loggers? Explain their working with block diagram. (5)
- 2 Explain the basic architecture of DAC. (5)
- 3 Define Sampling theorem. (5)
- 4 Explain the function of an opto-isolator in a PLC I/O module. (5)
- 5 Draw the ladder diagram of two inputs NOR gate. (5)
- 6 What are the data comparison instructions used in PLC programming? (5)
- 7 Write a short note on interlocking in PLC? (5)
- 8 Explain the interfacing of HMI to PLC. (5)

**PART B**

*Answer any three questions, each carries 10 marks.*

- 9 a) Draw the functional block diagram of a computer control system. (5)  
b) Write a short note on Supervisory computer control. (5)
- 10 a) Explain about Successive approximation ADC with an example. (7)  
b) What are isolation amplifiers? (3)
- 11 a) Explain the working of R-2R ladder DAC for a binary input 100. (7)  
b) Find the output voltage of a 6 bit DAC for binary input 101011. The step size is 5.1mV. (3)
- 12 What is Data Acquisition System? Draw the block diagram and explain its function? (10)
- 13 Illustrate the architecture of a PLC System with neat diagram. (10)

**PART C**

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

- 14 Describe the timers and counters in PLC with suitable examples. (15)
- 15 a) Draw and explain ladder diagram for traffic light control. (10)  
b) Write a note on PID instructions. (5)

- 16 a) What is the need for an HMI system? (8)  
b) List out the different types of HMI and explain each. (7)
- 17 a) Explain how a PLC is connected to a computer. (8)  
b) What are the requirements for communication networks of PLC? (7)