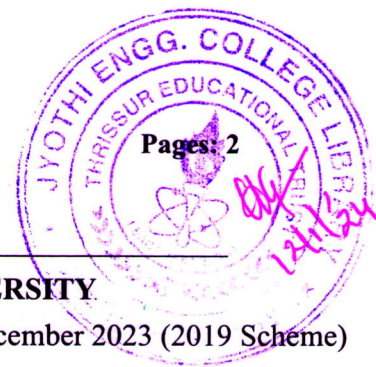


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Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech Degree Regular and Supplementary Examination December 2023 (2019 Scheme)

Course Code: MRT 305

Course Name: PLC & DATA ACQUISITION SYSTEMS

Max. Marks: 100

Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks)

		Marks
1	Draw the block diagram of PLC showing the basic components.	3
2	Discuss any three advantages of PLC.	3
3	Differentiate on-delay timer and off-delay timer.	3
4	Write notes on counters.	3
5	Explain MOVE instruction.	3
6	Explain SKIP instruction.	3
7	What is the need of computer in a control system?	3
8	What is RTU?	3
9	Explain the concept of aliasing.	3
10	Explain the condition to be satisfied to successfully re-construct a sampled signal.	3

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

- 11 a) Discuss in detail about various programming languages used in PLC. 6
- b) For the given Boolean expression obtain gate logic circuit and ladder logic diagram. $[(\bar{A} + B + C) * (D + E) + (P + Q)(R + S)] * T = Y$ 8
- 12 a) Draw the ladder diagram for AND, OR and NOT logic and explain its working. 6
- b) Explain the main components of a PLC with the help of a block diagram. 8

Module -2

- 13 a) What is an off-delay timer? Show the instruction structure of this timer and explain the functions of various parameters. 6
- b) Explain any four arithmetic instructions used in PLC with relevant example. 8
- 14 a) Discuss any three data comparison instructions in PLC with relevant examples. 6

- b) Design a ladder diagram to automate an industrial process of your choice using combination of timer and counter instructions. 8

Module -3

- 15 a) Write a ladder program to control water level in a tank. 10
b) Briefly discuss about PLC analog modules and systems. 4
- 16 a) Write a ladder program for sequential switching of motors. 10
b) Write notes on MCR instruction. 4

Module -4

- 17 a) Discuss four functions of SCADA. 4
b) What do you understand from Direct Digital Control? Discuss the structure of a DDC system. 10
- 18 a) Explain the functional block diagram of a computer control system. 7
b) Explain data logger with the help of a block diagram. 7

Module -5

- 19 a) Explain with a neat diagram, the process of interfacing ADC with microprocessor. 7
b) Draw and explain the block diagram of a data acquisition system. 7
- 20 a) With the help of a circuit diagram and necessary waveforms explain a sample and hold circuit. 7
b) Discuss about various multiplexing techniques used in DAS. 7
