



Reg No.: _____

Name: _____

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DEC 2019**

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.

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|---|--|---|
| 1 | Explain data loggers | 5 |
| 2 | Write a note on isolation amplifiers | 5 |
| 3 | Define and explain sampling theorem | 5 |
| 4 | Explain opto isolator in PLC input output module | 5 |
| 5 | Draw the ladder diagram for 2 input nand gate | 5 |
| 6 | Explain the counter functions of PLC | 5 |
| 7 | Explain interfacing HMI to PLC | 5 |
| 8 | List and explain PLC types | 5 |

PART B

Answer any three questions, each carries 10 marks.

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|----|---|----|
| 9 | a) What is interrupt in computer control? Explain | 5 |
| | b) Draw and explain block diagram of computer control | 5 |
| 10 | a) A 5 bit unipolar A/D converter has input range of 0 to 5 volts | 3 |
| | How many quantization levels are present with this A/D converter? What is its resolution? | |
| | b) If the converter output binary number is (10110) what is the voltage being read? | 3 |
| | c) State merits and demerits of SAR over dual slope ADC | 4 |
| 11 | a) Draw and explain data acquisition system | 7 |
| | b) What are the needs for DAS | 3 |
| 12 | a) Draw and explain scanning process in PLC | 7 |
| | b) List and explain the capabilities of PLCs | 3 |
| 13 | Explain the architecture of a PLC system with neat diagrams | 10 |

PART C

Answer any two questions, each carries 15 marks.

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|----|--|----|
| 14 | a) Draw a ladder diagram for liquid level controller | 10 |
| | b) Write a note on arithmetic instructions in PLC | 5 |

- 15 a) Explain following terms in PID control 8
- (i) Error
 - (ii) Set point
 - (iii) Process variable
 - (iv) Control variable
- b) Draw the ladder diagram for JK flip flop 7
- 16 a) What is the need for an HMI system 6
- b) Explain the networking in PLC 9
- 17 a) Describe the steps for connecting PLC to computer 9
- b) Explain interlocking with example 6