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# B.M.S. College of Engineering, Bengaluru-560019

**Autonomous Institute Affiliated to VTU**

## July / August 2024 Semester End Main Examinations

**Programme: B.E.** **Semester: VI**
**Branch: Electrical & Electronics Engineering** **Duration: 3 hrs.**
**Course Code: 19EE6OE1PS** **Max Marks: 100**
**Course: PLC and SCADA**

**Instructions**:1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

**Important Note:** Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

| | | | UNIT - I | *CO* | *PO* | Marks |
|---|---|---|---|---|---|---|
| 1 | a) | | What is data logger? Show a block diagram of data –logging system employed in a process control loop. | CO1 | PO1 | **06** |
| | b) | | Suggest a suitable block diagram of illustrate the concept of direct digital control (DDC) applied to an industrial process and justify the same. | CO1 | PO1 | **08** |
| | c) | | What are the features of Supervisory Control of Data Acquisition system has made it quite popular in today's world. | CO1 | PO1 | **06** |
| | | | **UNIT - II** | | | |
| 2 | a) | | With a neat block diagram, explain the basic architecture of PLC | CO1 | PO2 | **08** |
| | b) | | With a neat diagram, explain analog input & output to a PLC | CO2 | PO2 | **04** |
| | c) | | What are the various languages adopted for programming the PLC and explain standard cover the complete life cycle of PLCs as per IEC61131 standards. | CO2 | PO2 | **08** |
| | | | **UNIT - III** | | | |
| 3 | a) | | Describe pulse & retentive timer PLC instructions with neat diagram. | CO3 | PO2 | **08** |
| | b) | | Describe the counting sequence of an up counter & a down-counter. Also write a simple program for up-counter. | CO4 | PO2 | **08** |
| | c) | | Explain the counter part of the instructions. | CO3 | PO3 | **04** |
| | | | **OR** | | | |
| 4 | a) | | Describe Sequencing & Cascaded timers with relevant diagram. | CO4 | PO3 | **07** |
| | b) | | With a neat diagram explain generic up/down-counter Program and Counting. | CO3 | PO3 | **07** |
| | c) | | With a neat description and test sequence, develop the ladder logic that will turn on a light (201), after switch A (001) has been closed 10 times. Push button B (002) will reset the counters. | CO3 | PO3 | **06** |

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| | | | **UNIT - IV** | | | |
| | 5 | a) | Explain the operation of the following instructions.<br>(i) MOV<br>(ii) MVM<br>(iii) MEQ<br>(iv) LIM | CO3 | PO2 | **08** |
| | | b) | What do you mean by program control instructions? Explain any three | CO3 | PO3 | **08** |
| | | c) | Enumerate the PLC sequencer instructions with a neat block. | CO3 | PO2 | **04** |
| | | | **OR** | | | |
| | 6 | a) | Describe Move and masked Move instructions with associated status bits and address format. List all rules pertaining to MVM instruction. | CO3 | PO2 | **07** |
| | | b) | What are the advantages of using the file copy (COP) or fill file (FLL) instruction rather than FAL instruction for the transfer of data? | CO3 | PO2 | **07** |
| | | c) | Explain the operation of the following instructions<br>(i) JSR<br>(ii) SBR<br>(iii) RET | CO3 | PO2 | **06** |
| | | | **UNIT - V** | | | |
| | 7 | a) | Develop the DCS hierarchy diagram and discuss each level in detail. | CO2 | PO1 | **10** |
| | | b) | What are the different functional levels of DCS and how are they used in automation? | CO2 | PO2 | **10** |

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