

## GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER-VIII(NEW) EXAMINATION – SUMMER 2019**

**Subject Code:2182408**
**Date:09/05/2019**
**Subject Name:Programmable Logic Controller For Power Electronics**
**Time:10:30 AM TO 01:00 PM**
**Total Marks: 70**
**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

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|-----|--|----|
| Q.1 | (a) What is necessity of input/output modules ? Classify i/o modules.                    | 03 |
|     | (b) List out advantages of PLC over relay based logic.                                   | 04 |
|     | (c) Explain discrete input module with diagram.  | 07 |
| Q.2 | (a) Implement ladder diagram for $F(a,b,c) = \sum (0,2,4,6)$                             | 03 |
|     | (b) Implement ladder diagram for 4:1 Multiplexer.  | 04 |
|     | (c) Explain PLC memory in detail.  | 07 |
|     | <b>OR</b>  |    |
|     | (c) List out the rules to construct PLC ladder diagram.                                  | 07 |
| Q.3 | (a) Express the following function into ladder diagram.<br>$F=a'b'c+bc+b'c'+ac$          | 03 |
|     | (b) Explain Latch and Unlatch instruction with suitable example.                         | 04 |
|     | (c) List various timer instructions of PLC and explain any one with timing diagram.      | 07 |
|     | <b>OR</b>  |    |
| Q.3 | (a) List various analog input and output devices which can be interface with PLC.        | 03 |
|     | (b) List the trigonometric function possible with PLC. Explain one with suitable example | 04 |
|     | (c) Explain CTU (Up Counter) function with suitable example.                             | 07 |
| Q.4 | (a) Explain PLC move instruction.  | 03 |
|     | (b) Explain JUMP function in PLC with application  | 04 |
|     | (c) Explain any two data comparison instruction with block format and example.           | 07 |
|     | <b>OR</b>  |    |
| Q.4 | (a) Explain PLC FIFO function.   | 03 |
|     | (b) What is the importance of MCR function in PLC.                                       | 04 |
|     | (c) Explain any two data arithmetic instruction with block format and example.           | 07 |
| Q.5 | (a) List out different PLC programming languages.  | 03 |
|     | (b) Explain any application of Shift Register function in PLC.                           | 04 |
|     | (c) Explain PLC sequencer function with its example                                      | 07 |
|     | <b>OR</b>  |    |
| Q.5 | (a) Explain PLC AND matrix function.   | 03 |
|     | (b) Explain holding register of PLC.   | 04 |
|     | (c) Explain any application of PLC in power electronics.                                 | 07 |

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