Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VII • EXAMINATION – WINTER • 2014**

**Subject Code: 171702** **Date: 02-12-2014**

**Subject Name: Programmable Automation Controller**

**Time: 10:30 am - 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)** | Discuss advantages and disadvantages of PLC. | **07** |
| | **(b)** | Develop the ladder diagrams for the following<br>(i) 4 to 1 line multiplexer<br>(ii) F (a,b,c) = ∑ (0,1,3,4,6,7) | **07** |
| **Q.2** | **(a)** | Write a PLC ladder program to find the unknown frequency. | **07** |
| | **(b)** | An output pulse, V is to go on 4 seconds after an input W is turned on. Output pulse V should go low after 2 seconds of another input S is turned on. Develop the ladder diagram for this application.(Note: S turns on after W is turned on). | **07** |
| | | **OR** | |
| | **(b)** | A light is to be turned on if three input numbers have the same value. Develop the ladder diagram for this application. | **07** |
| **Q.3** | **(a)** | Explain PLC scanning in detail. | **07** |
| | **(b)** | Explain PLC input module with necessary sketch. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Write a PLC ladder logic equivalent for NAND and NOR as universal gates. | **07** |
| | **(b)** | Develop a PLC program to convert temperature in Celsius to temperature. In Fahrenheit. | **07** |
| **Q.4** | **(a)** | Explain REGISTER TO TABLE MOVE and TABLE TO REGISTER MOVE Functions in PLC. | **07** |
| | **(b)** | Explain implementation of Ratio control algorithm in PLC. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Explain the following functions in PLC with examples of each.<br>(i) BIT CLEAR<br>(ii) BIT SET<br>(iii) BIT FOLLOW | **07** |
| | **(b)** | Explain PLC SKIP function with an application. | **07** |
| **Q.5** | **(a)** | Two linear analog input signals of 0 to 78 volts are to be added and the result putout on a linear output of 0 to 150 volts. Trace the numbers if the inputs are 39 and 15 volts. Draw necessary sketch to carry out this operation using PLC and explain it. (PLC input and output modules are 8-bit base). | **07** |
| | **(b)** | Write short note on “Preventive maintenance of PLC”. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Explain the followings in PLC.<br>(i) Grounding Scheme<br>(ii) Suppression Techniques | **07** |
| | **(b)** | Discuss the factors to be considered in selecting a PLC. | **07** |

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