Seat No:_____

GANPAT UNIVERSITY

B. TECH SEM.VI ELECTRONICS & COMMUNICATIONS ENGINEERING

REGULAR EXAMINATION MAY/JUNE-2012

EC 606 INDUSTRIAL INSTRUMENTATION

TIME: 3 HOURS **TOTAL MARKS: 70**

INSTRUCTIONS:

1. Attempt all questions.
2. Answers to the two sections must be written in separate answer books.
3. Figures to the right indicate full marks.
4. Assume suitable data, if necessary.

SECTION-I

Que.-1 **(A)** Draw and Explain PLC block diagram. 4

(B) List and explain various methods for programming the PLC. 4

(C) List all the data files related to PLC. Explain any three of them. 4

OR

(A) List all hardware components of PLC. Explain any two in brief. 4

(B) Define following technical terms: 4

1. Nominal input voltage
2. Resolution
3. Backplane current draw
4. PLC

(C) Explain logical rack and remote I/O rack in detail. 4

Que.-2 **(A)** Develop the ladder logic that will turn on and hold on output L1 after 10 seconds of pressing push button A for 10 times. When push button B is pressed, output will be turn off and counter will be reset. 6

(B) Explain the features of Photo sensors. 5

OR

(A) Develop the ladder logic that will turn on and hold on output L2 after 5 seconds of pressing push button A for 7 times. When push button B is pressed, output will be turn off and counter will be reset. 6

(B) Explain different types of temperature sensors. 5

Que.-3 **(A)** Give the overview of SCADA system and its main components. 6

(B) Design ladder logic for the Boolean function given below. Y(t) is current output, whereas Y(t-1) is previous output. 3

1. Y(t)=(ABC+AB')(PQR)(Y(t-1))
2. Y(t)= (A+B'+Y(t-1)) * (CD)

(C) Explain OTL and OSR instructions. 3

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SECTION-II

Que.-4 **(A)** Explain LIM instruction with both conditions. Provide suitable example. **4**

(B) Explain the use of MCR instruction. **4**

(C) Write a program that uses the mask move instruction to move only the upper 8 bits of the value stored at address I:2.0 to address 0:2.1 and to ignore the lower 8 bits. **4**

OR

(A) Explain MOV and MVM instruction with suitable example. **4**

(B) Differentiate COP and FLL instructions with the aid of diagram. **4**

(C) Write a program that uses the mask move instruction to move only the lower r 8 bits of the value stored at address I:2.0 to address 0:2.1 and to ignore the upper 8 bits. **4**

Que.-5 **(A)** Explain how single timer can be used to keep track of 3 different timings such as 100 ticks, 200 ticks and 300 ticks. Selector switch is used for timing selection. Write a ladder program for this scenario. **6**

(B) Design 24-hour clock using timers and/or counters using ladder diagram. **5**

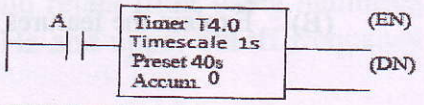
OR

(A) Explain how single counter can be used to count 3 different values such as 100, 200 and 300 boxes. Selector switch A is used for count selection. Write a ladder program for this scenario. **6**

(B) Explain barcode scanner and decoder. **5**

Que.-6 **(A)** Fill the table with proper status bit and Accumulator values. Timer is retentive. **6**

Timer T4.0 is retentive timer. Fill the following table based on the switch A condition.
Timer type: TON timer



Switch A	Open	Close	Close	Open	Close	Close	Open	Close
time (sec)	0 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40
T4.0/EN								
T4.0/TT								
T4.0/DN								
T4.0.ACC								

(B) 1. Find the value of K which satisfies $(4567)_8 = (K51)_{14}$. **3**

2. What is gray code for $(101010101100)_2$?

(C) Implement NAND, NOT and EX-NOR logic gates with ladder diagram. **3**

END OF PAPER