

GANPAT UNIVERSITY**B. Tech. Semester VI Electronics & Communication Engineering****Regular Examination, April/June-2016****2EC606 Industrial Instrumentation****Time: 3 Hrs.]****[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) Explain basic block diagram of programmable logic controller in detail. 4
- (B) Describe three typical modes of operation that can be selected by the key switch of a PLC processor. 4
- (C) Implement AND, OR, XOR and NAND gates in relay logic as well as ladder logic diagram. 4

OR

- Que.-1** (A) List all the data files with correct file numbers and explain any two of them. 4
- (B) Explain various methods to write PLC program with suitable examples. 4
- (D) Express each of the following equations as a ladder logic program: 4
1. $Y=(A+B)CD$
 2. $[(A'+B')C]+DE$
 3. $AB'C+D'+E$
 4. $A'BC'+DE'F$

- Que.-2** (A) Explain principle of MCR instruction.. Two MCR output instructions are to be programmed to control a section of a program. Explain the programming procedure to be followed. 4
- (B) Develop the ladder logic that will turn on output L1 after 10 seconds of pushing push button A 10 times. When push button B is pressed, output will be turn off and counter will be reset. 4
- (C) Give an explanation of how a scanner and a decoder act in conjunction with each other to read a bar code. 3

OR

- Que.-2** (A) Write a program that will increment a counter's accumulated value 1 count every 60 s. A second counter's accumulated value will increment 1 count every time the first counter's accumulated value reaches 60. The first counter will reset when its accumulated value reaches 60, and the second counter will reset when its accumulated value reaches 12. 4
- (B) Outline the method used to actuate inductive and capacitive proximity sensors. 4
- (C) Compare the method of operation of each of the following types of switches: 3
- a. Manually operated switch
 - b. Mechanically operated switch
 - c. Proximity switch

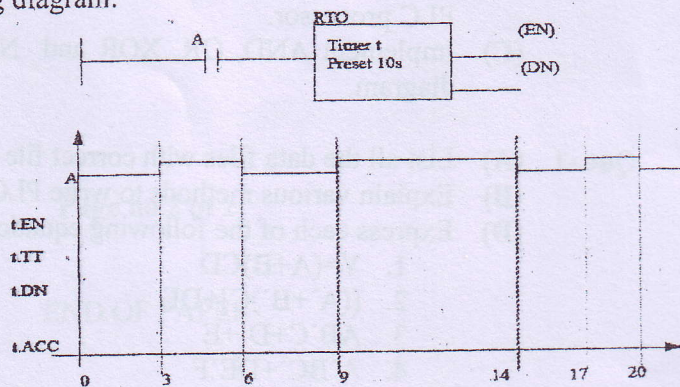
- Que.-3** (A) What is the main advantage of the jump instruction? What types of instructions are not normally included inside the jumped section of a program? Why? 4
- (B) What is sequencer? Explain SQO instruction in detail. 4
- (C) Compare MOV and MVM instructions. 4

SECTION-II

- Que.-4 (A) Write a program for traffic light controller design having following parameters. 4
1. Turn on the red light for 30 sec
 2. Then Turn on the green light for next 10 sec
 3. Then Turn on yellow light for next 4 sec
 4. Repeat steps 1 to 3 again.
- (B) When are the immediate input and immediate output instructions used? Why is it of little benefit to program an immediate input or immediate output instruction near the beginning of a program? 4
- (C) Design a ladder program that will add the values stored at N7:23 and N7:24 and store the result in N7:30 whenever input A is true, and then, when input B is true, will copy the data from N7:30 to N7:31. 4

OR

- Que.-4 (A) Explain STI instruction with STD, STE. 4
- (B) Explain LIM function with both conditions with suitable example. 4
- (C) Complete the following timing diagram. 4



- Que.-5 (A) Construct a ladder program to convert °C to °F. (use expression $F = (9/5 * C) + 32$) 4
- (B) Draw and explain working of NOTC and NOTO contacts with suitable example. 4
- (C) Compare continuous and batch processes. 3

OR

- Que.-5 (A) Write a program to perform the following: 4
- a. Turn on pilot light 1 if the thumbwheel switch value is less than 4.
 - b. Turn on pilot light 3 if the thumbwheel switch value is greater than 4.
 - c. Turn on pilot light 4 if the thumbwheel switch value is less than or equal to 4.
 - d. Turn on pilot light 5 if the thumbwheel switch value is greater than or equal to 4.
- (B) Write a short note on SCADA. 4
- (C) Which type of sensor are used for water level measurement. explain working of any one 3

- Que.-6 (A) List the six parameters and addresses that must be entered into the file arithmetic and logic (FAL) instruction. Write a program that uses the FAL instruction to copy 20 words of data from the integer data file, starting with N7:40, into the integer data file, starting with N7:80. 6
- (B) Draw an electrical symbol used to represent each of the following PLC output control devices: 6
- a. NC temperature switch
 - b. NO Pressure switch
 - c. NC Level switch
 - d. Solenoid
 - e. NO limit switch
 - f. Heater

End of Paper