

GUJARAT TECHNOLOGICAL UNIVERSITY
B.E. - SEMESTER – VIII EXAMINATION – OCTOBER 2012

Subject code: 182001

Date: 27/10/2012

Subject Name: Programmable Logic Controllers

Time: 02.30pm - 05.00pm

Total Marks: 70

Instructions:

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

- Q.1** (a) Explain advantages and disadvantages of PLC based control systems over conventional relay based control systems. **07**
 (b) Draw and explain DC input card of PLC. **07**

- Q.2** (a) Explain interfacing of different inputs and outputs/actuators with PLC with suitable examples and diagrams. **07**
 (b) Write a short note on scan time of PLC and also explain importance of scan time. **07**

OR

- (b) Draw and explain block diagram of PLC. **07**

- Q.3** (a) Explain different conventions adopted in ladder diagrams. **07**
 (b) Design FBD program for the ladder diagram given in figure 1. **07**

OR

- Q.3** (a) Explain FBD programming of PLC in detail. **07**
 (b) Give Instruction List (IL) program for the ladder diagram given in figure 1. **07**

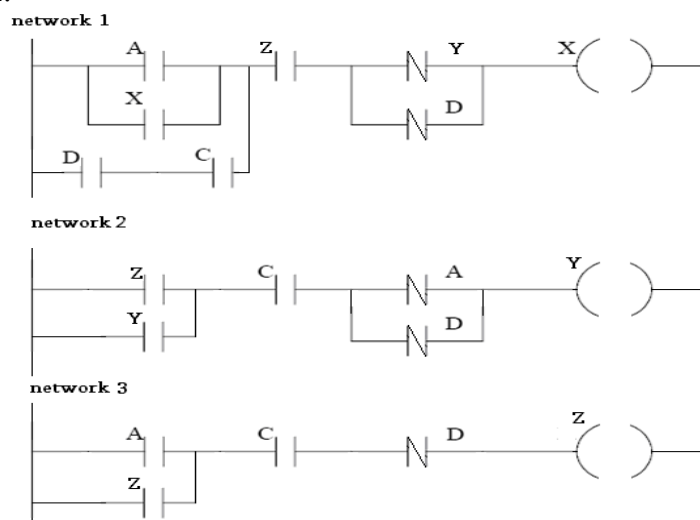


Figure 1

- Q.4** (a) Explain different counter instructions in PLC with suitable examples. **07**
 (b) Explain Jump instructions in PLC with suitable examples. **07**

OR

- Q.4** (a) Explain different arithmetic instructions in PLC. **07**
 (b) Explain On Delay timer and OFF Delay timer instructions with timing diagrams. **07**

- Q.5 (a)** How the analog inputs and outputs are handled by PLC? Explain in detail. **07**
- (b)** A handicap door opener has a button that will open two doors. When the button is pushed (momentarily) the first door will start to open immediately, the second door will start to open 2 seconds later. The first door power will stay open for a total of 10 seconds, and the second door power will stay on for 14 seconds. Design a PLC FBD to execute this sequence correctly. **07**

OR

- Q.5 (a)** Enlist different data comparison instructions in PLC and explain all of them in detail. **07**
- (b)** Two feeder conveyors (F1 and F2) feed parts to a main conveyor (M). Both F1 and F2 are having 'NC' proximity sensor at the end. When 'NO' START pushbutton is pressed, F1 will be turned ON and after feeding 5 parts to M, F1 will be turned OFF. After waiting for 7 seconds, F2 will be turned ON and will remain in ON condition until it feeds 7 parts to M. When all 12 parts are arrived, M will be turned ON for 1 minute. If at any time 'NC' STOP pushbutton is pressed, all the outputs will be turned OFF. Design ladder diagram to execute this sequence correctly. **07**
