

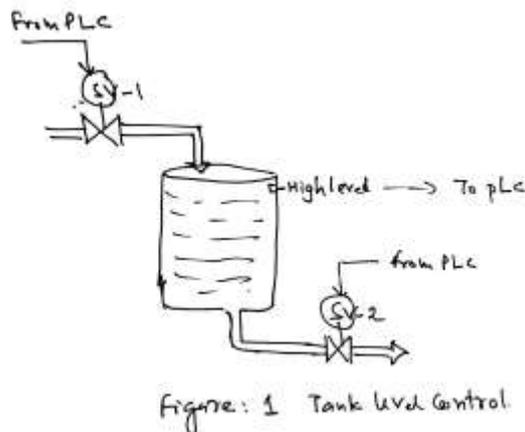
GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2018****Subject Code:2161709****Date:30/11/2018****Subject Name:Programmable Logic Controller****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

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

	MARKS
Q.1 (a) List the benefits offer by PLC. Explain at least four in brief.	03
(b) Why programming tools are essential part with PLC operation? How it differ from Personal Computer as programming tool? Explain it technically.	04
(c) List the input field and output field device and draw its equivalent ladder Symbols.	07
Q.2 (a) Explain differences between fixed I/O's and modular I/O's.	03
(b) What is the advantages offer by HMI? Explain it in details	04
(c) Develop Ladder logic diagram for each of the following Boolean expressions using AND, OR, and NOT gates:	07
(a) $Y = ABC + D$	
(b) $Y = AB + CD$	
(c) $Y = (A + B) (\bar{C} + D)$	

OR

(c) Draw and describe Input Image Table and Output Image table.	07
Q.3 (a) How will High Speed Counter module works? Describe with Suitable Application	03
(b) Describe with neat sketch and operation with PLC (1) Proximity Sensor (2) Magnetic Reed Relay.	04
(c) Prepare Ladder Logic Diagram (LLD) for following process control. Fill tank (T) fully by opening inlet solenoid valve SV-1. When it full, open outlet valve SV-2 for 5 sec. Either open SV-1 for 10 sec or till the tank is full which will occur first than open SV2 again. Repeat it continuously.	07

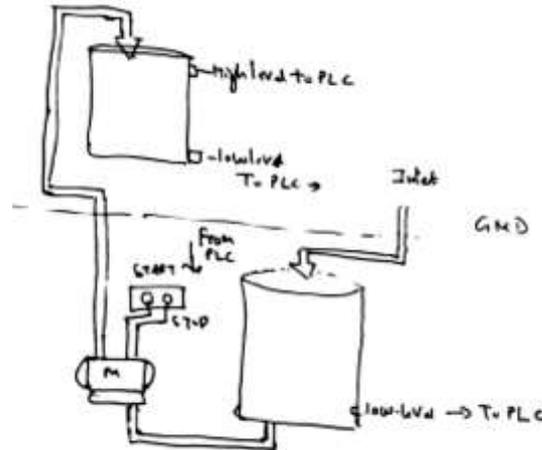
**OR**

Q.3 (a) Why Latch and Unlatch Instruction required in PLC Programming? How it is close to retentive timer operation.	03
(b) Draw and describe ON Timer delay instruction with suitable example	04
(c) Prepare LLD to count how many persons attend reception in dining hall? Use counter at entry as well as at exit.	07

- Q.4 (a)** How floating point math instruction is differ than conventional math instruction ? Explain for ADD, SUB, MUL and DIV instruction. **03**
- (b)** Draw and design LLD to generate wave from with 40% duty cycle at digital output terminal when toggle switch is ON. Take output frequency y generated by assigning TIMER as 5 sec On time and 3 sec OFF timer **04**
- (c)** Prepare LLD to Turn-On Lamp-1 for 5 sec, Lamp-2 for 10 sec, Lamp-3 for 15 sec and Lamp-4 for 20 sec sequentially (At a time only one lamp will be ON). Repeat it continuously. **07**

OR

- Q.4 (a)** Why tuning is required in PID Module? Describe PID module along with technical reason. **03**
- (b)** Justify the need of Interrupt in PLC operation. Describe following instruction
 1. ENI 2. RETI
 3. DTCH 4. CLR_EVNT **04**
- (c)** Develop LLD an alarm annunciator system. Switch OFF the lamp when 120 sec passed without any acknowledgement. **07**
- Q.5 (a)** How will you implements communication network for PLC? Explain with industrial communication. **03**
- (b)** Draw and illustrate twin axis Robot with PLC sequencer control **04**
- (c)** Prepare LLD for following Level Control System. **07**
 Be sure motor star when Low Level switch is OFF(Open) and Overhead tank High switch is Open (OFF).



OR

- Q.5 (a)** Enlist data handling Function. Describe for data move and rotate instructions. **03**
- (b)** Describe with ladder diagram, Structured Text, Function block diagram, Instruction list, sequential function chart type PLC Languages **04**
- (c)** Prepare LLD for Batch process control **07**
 1. Open SV-1 to fill fluid in the tank till level switch will be ON. Otherwise OFF.
 2. Be sure once level achieved, SV-2 will open,
 3. Motor will be started, Wait till temperature achieved.
 4. Stop motor. OFF SV-2
 5. ON SV-3 for 10 sec
 5. Repeat from step 1 .
 Be sure once SV-2

