____ **C.U.SHAH UNIVERSITY Summer Examination-2018**

Subject Name: Programmable Logic Controller and Applications

Subject Code: 4TE08PLA1		Branch: B.Tech (EC)	
Semester: 8	Date: 01/05/2018	Time: 02:30 To 05:30	Marks: 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

Q-1		Attempt all questions	(14)
-	a)	In which industrial plant, the first PLC was mainly installed?	1
	b)	What do you mean by PLC architecture?	1
	c)	Draw the typical block diagram of fixed type PLC.	1
	d)	Draw the typical block diagram of modular type PLC.	1
	e)	Which type of isolator is used to electrically isolate the internal components from I/O terminals in PLC?	1
	f)	Enlist the different input and output devices connected to terminals of I/O systems in PLC.	1
	g)	Which types of communication systems are used when processes to be controlled by PLC are a long distance from the CPU?	1
	h)	Define the term PLC scan process with diagram.	1
	i)	State and function of the first block of input module of PLC.	1
	j)	Write one application of PLC.	1
	k)	Write any one disadvantage of PLC.	1
	l)	How many types PMs in common use for PLC? State their names.	1
	m)	Which are the main functions of input and output interface modules in PLC?	1
	n)	State any four special I/O modules used in PLCs.	1
Attempt	any	four questions from Q-2 to Q-8	
Q-2		Attempt all questions	(14)
	(a)	Explain in detail with example principles of operation of PLC.	7
	(b)	State major advantages of using PLC. Explain any six in detail.	7
Q-3		Attempt all questions	(14)
	(a)	Draw and explain in detail block diagram of input module interfaces for PLC.	5
	(b)	Write short notes on major programming equipments used for PLC.	5
	(c)	Explain in detail any two special I/O modules.	4
Q-4		Attempt all questions	(14)
	(a)	Explain in detail with diagram analog I/O modules used in PLC.	
	(b)	State different typical discrete I/O module specifications. Explain in detail any four.	5 5



	(c)	State major limitation of using PLC. Explain any three in detail.	4
Q-5		Attempt all questions	(14)
	(a)	Draw the ladder logic programs for following logic gates	7
		1. AND 2. OR 3. EX-NOR 4. NAND	
		Express each of the following equations as a ladder logic program:	
		1. $Y = \overline{AB} + \overline{CD} + \overline{CBE}$ 2. $Y = (A+BC)DE$ 3. $Y = ABC + DE + E$	
	(b)	Write short notes on Programming Word Level Logic Instructions.	7
Q-6		Attempt all questions	(14)
	(a)	Explain in detail with examples different relay type instructions.	7
	(b)	Explain in detail with ladder program example PLC program scan cycle.	7
Q-7		Attempt all questions	(14)
	(a)	Explain in detail with example cascading of timers.	7
	(b)	Classify data manipulation instructions into two broad categories. Explain	7
		data transfer operations in detail with examples.	
Q-8		Attempt all questions	(14)
	(a)	Describe the operation of the master control reset instruction and develop an elementary program illustrating its use	7
	(b)	Discuss the factors to be considered in selecting a PLC.	7

Page 2 || 2

