

# COURSE TITLE = TEXTRONICS COURSE CODE = TT-603

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## TEXTRONICS









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# TEXTRONICS

➤The term 'Textronics' refers to interdisciplinary approaches in the processes of producing and designing textile materials.

It is a synergic connection of Textile
industry, Electronics and Computer
science with elements of automatics
and metrology knowledge.

Metrology: the Scientific study of measurement.













## Microcontroller

# >PLC(Programmable Logic Controller)





#### :Digital Electronics:

## **Analog vs Digital :**

 $\blacktriangleright$  <u>Analog signal</u>: An analog signal signifies a continuous signal that keeps changes with a time period.

Digital signal : A digital signal signifies a discrete signal that carries binary data and has discrete values.

Digital signal is square waves but Analog signals range will not be set.











## **:Analog Electronics vs Digital Electronics:**

#### Analog Electronics

- Analog Electronics deals with Analog Signal which is a continuous signal i.e. it varies continuously with time. Most of the signals are analog in nature.
- ➢ It has usually larger circuits and occupies more area.
- Analog measuring instruments are less accurate and chances of misreading are more.
- ➤ The instruments are delicate and harms are more in case of drops and falls.

#### **Digital Electronics**



Digital Electronics deals with digital signal which is discrete signal i.e. it carries binary data and has discrete values.

- ➢ It has smaller integrated circuits and occupies lesser area.
- Digital measuring instruments are more accurate and there is no case of misreading.
- The instruments are more strong and there are lesser harms on drops and falls.



## **:Decimal and Binary Number System:**



- □ Zero (0) and One(1) are known as binary numbers.
- □ <u>Binary Number System</u>: It is a Base-2 numbering system that represents each numeric values using two unique digits Zero (0) and One (1).

i.e.  $(5)_{10} = (0101)_2$ 

### □ <u>LSB and MSB:</u>

Right-hand most bit of a binary number is known as *Least Significant Bit(LSB)* and the left-hand most bit of a binary number is known as *Most Significant Bit(MSB)*.

Decimal	Binary	
0	0000	Number
1	0001	Binary Di
2	0010	1
3	0011	4
4	0100	8
5	0101	
6	0110	10
7	0111	32
8	1000	64
9	1001	6

Number of Binary Digits	Common Name		
1	Bit		
4	Nibble		
8	Byte		
16	Word		
32	Double Word Quad Word		
64			

MSB	Binary Digit							LSB
28	27	26	<b>2</b> <sup>5</sup>	24	23	22	21	20
256	128	64	32	16	8	4	2	1



## **:Conversion of Binary and Decimal:**

# A

#### Decimal to Binary Conversion

- *Step I*: Write down the **decimal** number and to continually divide-by-2 (two) to give a result and a remainder of either a "1" or a "0" until the final result equals zero.
- *Step II*: Write all reminders from downwards(MSB) to upwards(LSB).



#### **Binary to Decimal Conversion**

- *Step I:* Multiply each digits of binary numbers(Right to left) with their corresponding weights or power of 2.
- *Step II*: Add all the values evaluated in step I.

MSB	4SB Binary Digit							
28	27	26	25	24	23	22	21	20
256	128	64	32	16	8	4	2	1









# **Q)** Convert following Binary numbers to Decimal.

- i) (111001)<sub>2</sub>
- ii) (100011)<sub>2</sub>
- iii) (11111)<sub>2</sub>
- iv) (1100)<sub>2</sub>
- v)  $(1000000)_2$

#### Ans:

- i. (57)<sub>10</sub>
- ii. (35)<sub>10</sub>
- iii. (31)<sub>10</sub>
- iv. (12)<sub>10</sub>
- v.  $(128)_{10}$

# **Q)** Convert following Decimal numbers to Binary.

- i) (23)<sub>10</sub>
- ii) (29)<sub>10</sub>
- iii) (256)<sub>10</sub>
- iv) (15)<sub>10</sub>
- v)  $(21)_{10}$

#### Ans:

- i. (10111)<sub>2</sub>
- ii. (11101)<sub>2</sub>
- iii. (10000000)<sub>2</sub>
- iv. (1111)<sub>2</sub>
- v. (10101)<sub>2</sub>