SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++'(III Cycle) Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

23ECB201 – DIGIT AL SYSTEMS DESIGN

II YEAR/ III SEMESTER

UNIT 2 – COMBINATIONAL CIRCUITS

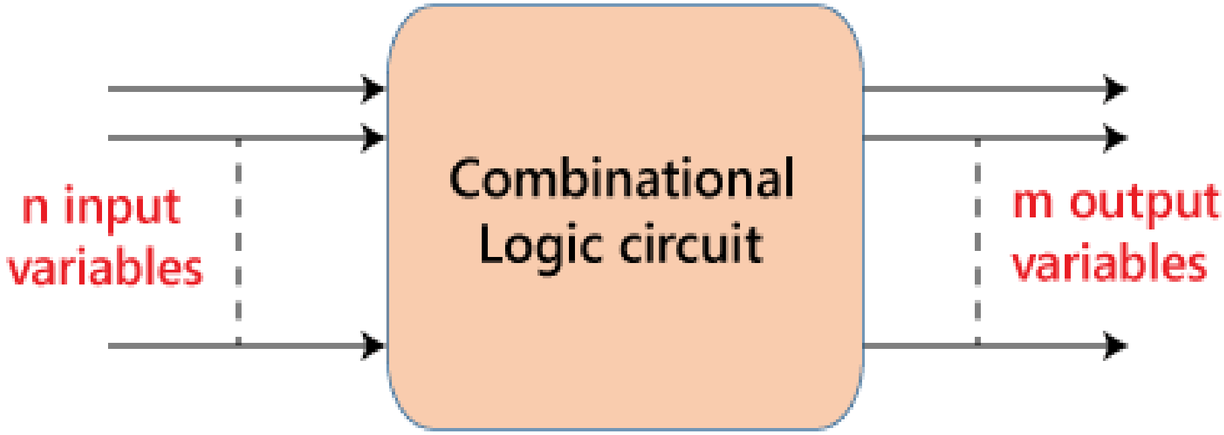
TOPIC- COMBINATIONAL CIRCUITS

WHAT IS COMBINATIONAL CIRCUIT?

- Output is function of input only (i.e) no feedback

- A combinational circuit is a circuit in which the output depends on the present combination of inputs.

COMBINATIONAL CIRCUIT



Block diagram of a combinational circuit

Input Lines − The input lines are used to enter the input values into the combinational circuit.

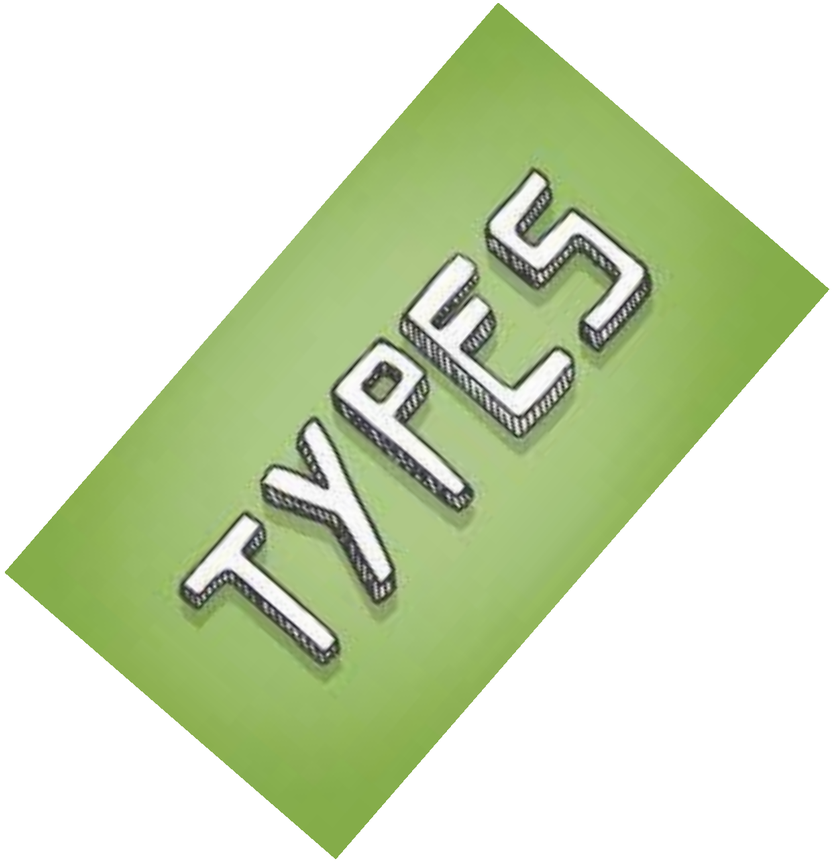
Processing Unit − It is the main element that processes the input values depending on the type of the circuit. For example, a full adder adds three binary bits.

Output Lines − The output lines are used to take results generated by the circuit.

FEATURES OF COMBINATIONAL CIRCUITS

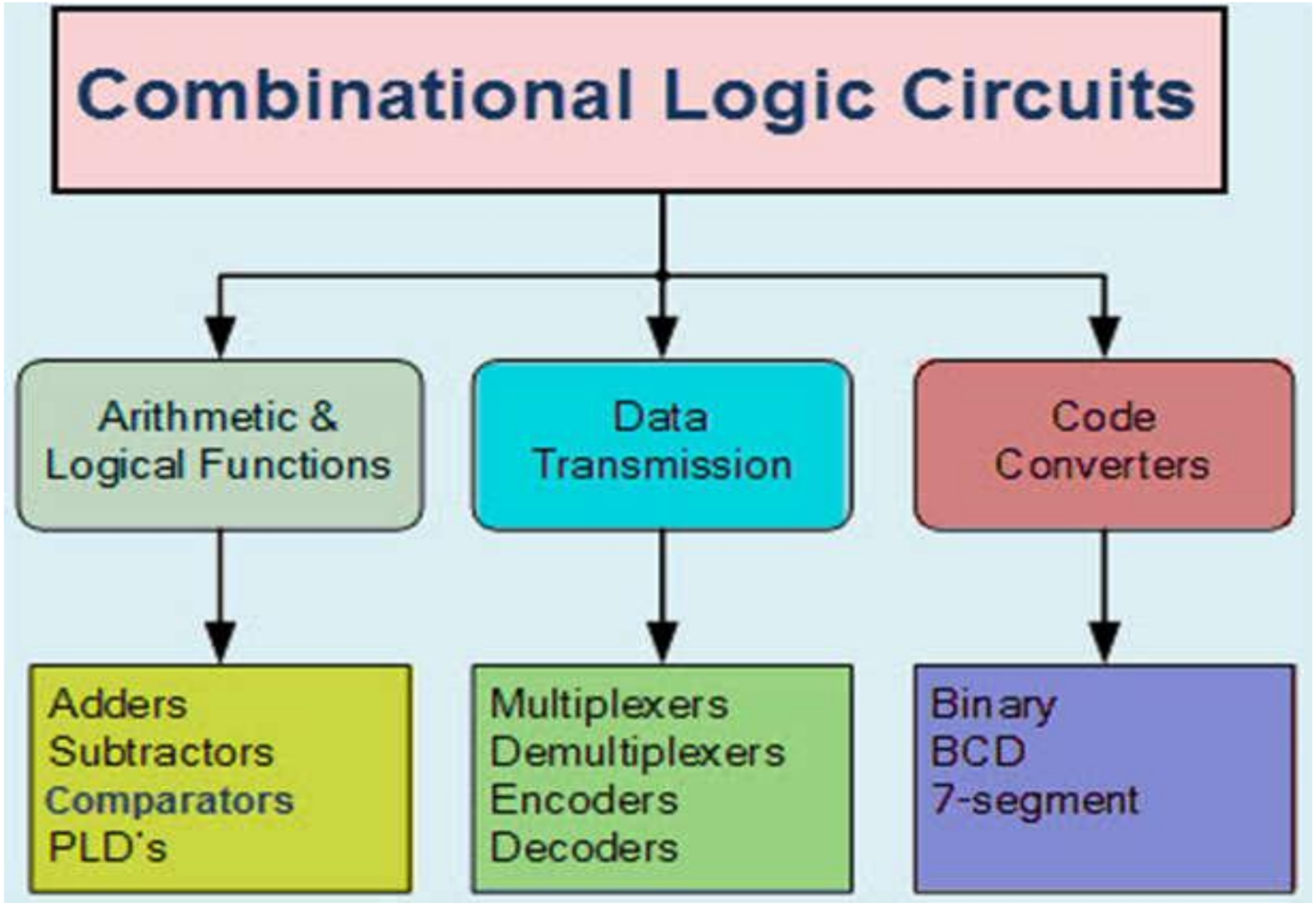
- In this output depends only upon present input.
- Speed is fast.
- Easy designed.
- There is no feedback between input and output.
- It is time independent.
- Elementary building blocks are Logic gates.
- Used for both arithmetic and Boolean expressions.
- Combinational circuits don’t have the capability to store any state.

TYPES OF COMBINATIONAL CIRCUITS



- Binary Adders
- Binary Subtractors
- Multiplexers (MUX)
- Demultiplexers (DEMUX)
- Encoders
- Decoders
- Comparators

APPLICATIONS OF COMBINATIONAL CIRCUITS



ADVANTAGES AND DISADVANTAGES

ADVANTAGES

- Simplicity
- Real-time Operation
- Deterministic Behavior

DISADVANTAGES

- Limited Functionality
- Lack of Flexibility
- Increased Complexity for Large Designs

ASSESSMENT QUESTIONS

1. The output is dependent only on present input?

a) Combinational Circuits

b) Analog Circuits

c) Flip Flop

d) Sequential Circuits

2. Which is an example of combinational circuit?

a) Shift Registers

b) Multiplexers

c) Counters

d) Flip Flops

THANK YOU