

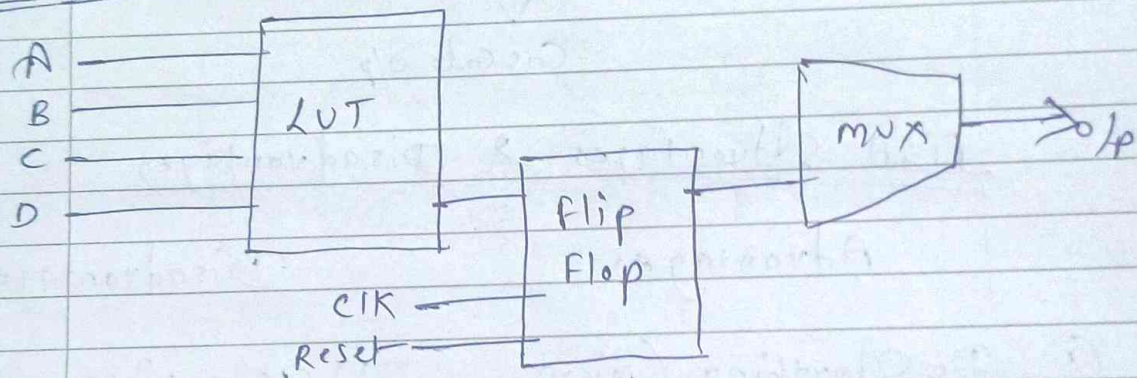
Configurable Logic Blocks (CLB's)

- ① Digital Sub circuits
- ② Efficiently implement Common functions.
- ③ Highly flexible.

including → Look up tables, Storage elements

(FF or Registers), multiplexer.

Logic Block



CLB

- ★ Connect CLB's to one another
- Connect CLB's to external circuitry.

LUT's question

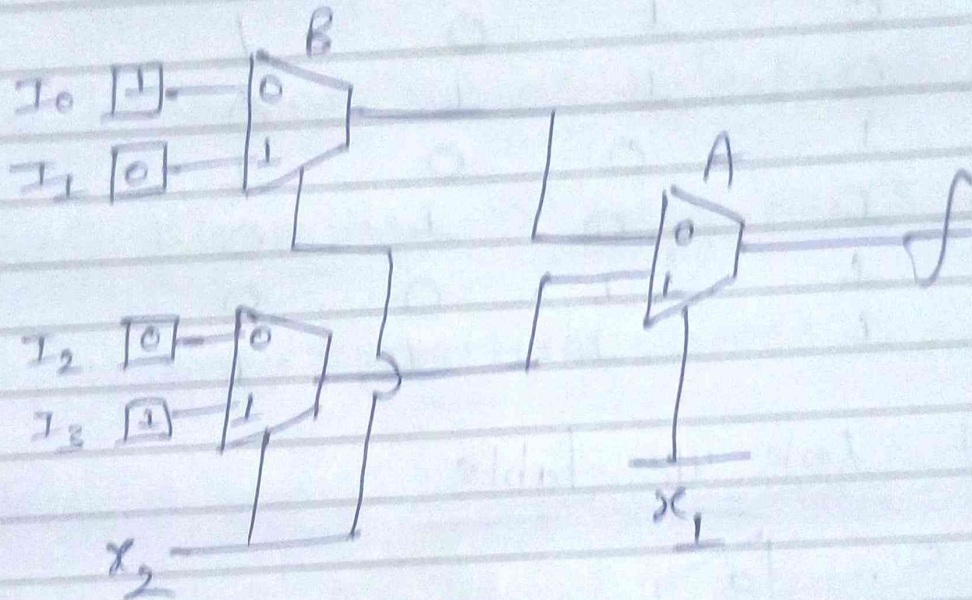
Q.

$$f = x_1'x_2' + x_1x_2$$

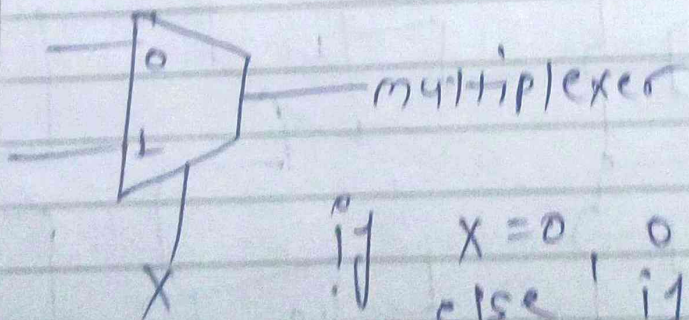
Truth Table

x_1	x_2	f
0	0	1
0	1	0
1	0	0
1	1	1

look up
table
using x_1 and x_2



LUT : Look up table



if $x=0$, 0 will be selected
else if $x=1$, 1 channel
will be selected.

So the function is,

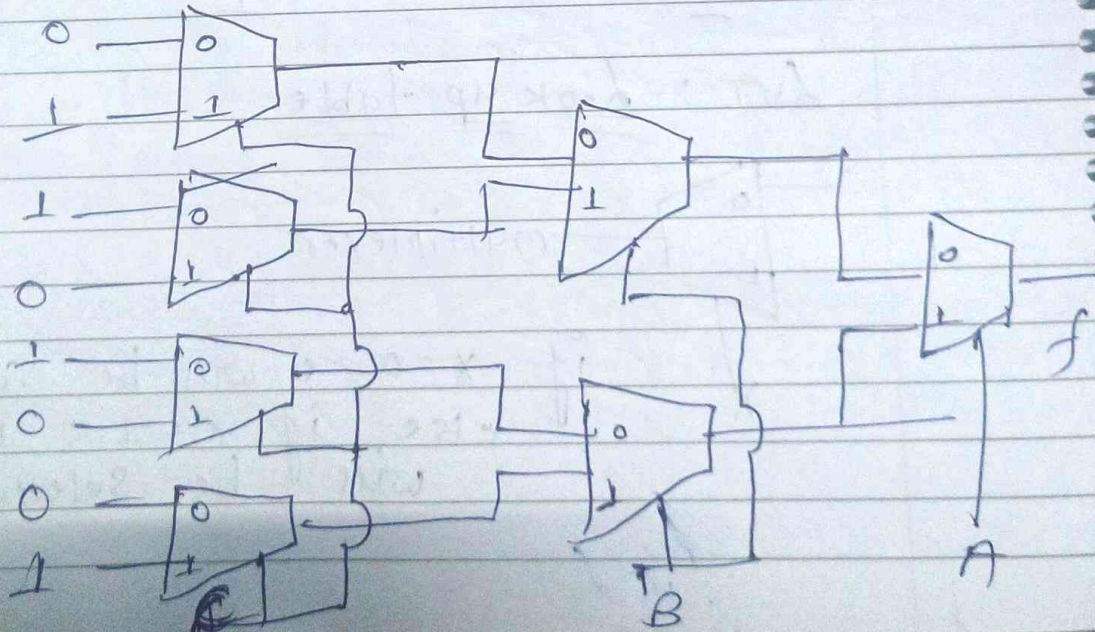
$$f = x_1'x_2' + x_1x_2$$

Q.2 making adder using previous ckt

Truth table

A	B	C	f
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

Look up table



Q. what do you mean by PLD?

Ans- PLD Stands for Programmable Logic device. It's an integrated circuit (IC) that can be programmed to perform specific digital logic functions.

Characteristics of PLD's:

- ① Programmable → PLD can be programmed to implement various digital logic functions.
- ② Reconfigurable → Many PLD's can be reprogrammed multiple times.
- ③ Digital logic → PLDs are used to implement digital logic functions. Such as Combinational & Sequential logic.

Types of PLD's

- ① PROM (programmable Read only memory)

A type of PLD that can be programmed once.

- ② PAL (programmable Array logic)

A type of PLD that can be programmed to implement Combinational logic functions.

③ GA (Generic Array logic) →

A type of PLD that can be reprogrammed and used to implement Combinational & Sequential logic functions.

④ FPGA (Field-Programmable Gate Array)

A type of PLD that can be programmed to implement Complex digital systems.

Applications of PLD's →

① Digital Design → PLD are used to implement digital logic functions in a wide range of applications.

② Prototyping → PLD can be used to prototype digital systems before implementing them in ASIC's (Application-Specific Integrated Circuits)

⑤ Embedded Systems → PLD's are used in embedded systems to implement digital logic functions.

PLD offer flexibility, reconfigurable & rapid development, making them a popular choice for digital design & development.

FPGA Board Names

Here are some popular FPGA board names.

Xilinx X FPGA Boards

① Zed Board → A popular development board featuring the Xilinx Zynq-7000 SoC.

② Zybo → A low-cost development board featuring the Xilinx Zynq-7000 SoC.

③ Nexys 4 DDR → A development board featuring the Xilinx Artix-7 FPGA.

④ Basys 3 → A low cost development Board featuring the Xilinx Artix-7 FPGA.

Intel FPGA Boards →

① DE10-Nano → A development board featuring the Intel Cyclone V SOC.

② DE1-SOC → A development board featuring the Intel Cyclone V SOC.

③ Cyclone V SOC Development Kit → A development board featuring the Intel cyclone V, SOC.

APR/MAY 2016

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FPGA

ASIC

1) ReConfigurable CRT

1) Permanent CRT.

2) Design in specified using HDL

2) Design in Specified using HDL.

3) Not Suited for Very high - Volume mass Production.

3) Suited for Very high - Volume mass Production.

3) Less energy Efficient

3) much more power efficient.

30 SATURDAY
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4) Suited for applications Such as Radars, Cell Phones Base Stations where design need to be upgraded.

4) Not Suited for applications Areas where the design need to be upgraded.

Evening

1 SUNDAY • 122-244

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Q. Difference between HDL & High level language.

1) A Specialized Computer language used to describe the structure & behavior of electronic circuit most commonly digital logic circuits.

1) A Computer language used to write a set of instruction to allow the user to program a specific task.

TUESDAY

3

124-242

2) more Complex

2) Not as Complex.

3) Verilog & VHDL

3) Java, C, C++

are Common examples.

Python, PHP etc.

4) Describe the behavior of Digital ckt.

4) Helps to develop various application.

Evening

MAY 2016						
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Basys 3 → A low cost development

Board

MAY 2016

4 WEDNESDAY
135-241

Dvg between CPLD & FPGA

CPLD

FPGA

1) Stands for Complex
Prog. Logic device

2) Stands for field
Prog gate Array.

3) CPLD provide
highest performance

2) FPGA are offered
in a wide density

but they also contain

range, from few

fewer less registers

thousand gates to

5 THURSDAY
136-242

Several million gates.

3) CPLD Consume
more power

3) FPGA Consumes less
power than CPLD.

than FPGA devices.

4) process tech. are
EPROM, EEPROM,
& Flash.

4) Process technology
are SRAM, antifuse,
& EEPROM.

5) CPLD doesn't
require any

FPGA in Variably
required one or more

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Size of fpa used.

FP4A Gaines

arrays of logic cells
are less partitioned
than CRO's.

→ A no. of IIR-ole pins ordered by RPA are less than CLO.

Pins offered by
RFA are less
than CLO.

129-237 • SUNDAY 8