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15/ENG02/002

COMPUTER ENGINEERING

COE Assignment

1) ASIC: (Application-specific Integrated Circuit) is a microchip designed for a special application, such as a particular kind of transmission protocol or a hand-held computer.

PAL: (Programmable Array Logic) is a type of programmable logic device (PLD) used to realize a particular logical function. PALs comprise of an AND gate array followed by an OR gate array.

PLA: (Programmable Logic Array) is a kind of programmable logic device used to implement combinational logic circuits. It has a set of programmable AND gate planes linked to OR gate planes to produce an output.

PLD: (Programmable Logic Device) they are an integrated circuit that you program using a hardware description language such as VHDL or Verilog.

CPLD (Complex programmable logic device): is a complex device than PLD's. It contains the circuitry similar to PAL devices. It also has a predictable timing.

characteristic suitable for critical control applications

FPGA (field-programmable gate array): is an electronic component used to build reconfigurable digital circuits. FPGA is different from logic gate because logic gate has a fixed function.

2) Higher granularity always leads to lesser delay between the input and output. As granularity increases, number of levels of logic in critical path decreases. On the flip side with increase in granularity level average fan out increases and number of switches increases as each block has more pins.

3) Programmable logic devices may be considered because:

i) It is easy to add field modifications by loading new code to the in-circuit programmable device or replacing a chip in a socket.

ii) As long as the I/O's are connected right, the PCB can be used for development while making changes in code on PC's

iii) It's also faster, cleaner and easier to modify and upgrade.

4) The stored program ends up being Read only and also non-volatile. This is the reason why they are called OTP (One-time programmable) because it is an EPROM cell which is 100% compatible with that of conventional logic circuit.

$$F_1(w, x, y, z) = w\bar{x}yz + w\bar{x}y\bar{z} + wx\bar{y}$$

$$F_2(w, x, y, z) = w\bar{x}y + \bar{x}\bar{y}z$$

