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**COMPUTER ENGINEERING**

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QUESTION 1

ASIC - Application-Specific Integrated Circuit. It is a microchip designed for a special application, rather than general-purpose, such as a kind of transmission protocol or a hand-held computer.

PAL- Programmable Array Logic. It is a family of [programmable](https://en.wikipedia.org/wiki/Programmable_logic_device) logic device semiconductors used to implement logic functions in digital [circuits](https://en.wikipedia.org/wiki/Electrical_network)

PLA - Programmable Logic Array. It is a kind of programmable logic device used to implement combinational logic circuits.

PLD - Programmable Logic Device. It is an electronic component used to build reconfigurable digital circuits.

CPLD - Complex Programmable Logic Device. It is a programmable logic device with complexity between that of PALs and FPGAs, and architectural features of both.

FPGA: Field Programmable Gate Array. It is a device that contains a matrix of reconfigurable gate array logic circuitry.

QUESTION 2

Higher granularity level results in lesser delay between input and output. As the granularity of logic block increases, number of levels of logic in critical path decreases, and hence delay in critical path decreases.

QUESTION 3

A person would use PLD in place of traditional "hard-wired" logic because of the following reasons:

1. Reliability - Traditional mechanical relays from hardwired logic wear out much faster than the electronics in a PLD.
2. Ease of Troubleshooting - Another advantage of a PLC system is the ease of troubleshooting. In a relay system, there will be several more wires plus the relays and possibly other components that aren’t needed in a PLC. This makes finding problems much harder.
3. Easy Expandability - One of the best features that a PLC system has over a traditional hard-wired logic is versatility with the programming and easy expandability. For a hard-wired logic, you would have to add an entirely new physical component.
4. Smaller Size - The physical size requirements of a PLC system are far smaller than a cabinet needed for relay logic circuitry.

Hard-wired logic would do a better job than a programmable device where there is need for:

1. High integrity tasks (e.g. HIPPS - High Integrity Pressure Protection Systems)
2. High speed of response (e.g. gas turbines)
3. An application that should be resistant to cyber attacks
4. applications when safety instrumented functions (SIF) are simple, and when there are very few SIF to be implemented.

QUESTION 4

Advantages of “blowing” tiny fuses inside PLDs

1. PLDs will have specific purpose, making them work faster
2. It helps to break unwanted connection

Disadvantage of “blowing” tiny fuses inside PLDs

1. The stored program will be nonvolatile, but it will also be read-only

QUESTION 5

