

Q-02) Minimize the given Boolean Expression by using the four-variable K-map.

$$P = \overline{(A, B, C, D)} = \sum m(1, 5, 6, 12, 13, 14) + d(2, 4)$$

tutorial 04:-

Q-01) What is the purpose of general-purpose registers in computer architecture, and how are they typically used?

store and manipulate data during program execution.

- data storage
 - fast access
 - register file
 - operand manipulation
 - addressing
 - context switching
 - function parameters and return values.
- to store arithmetic or logical data temporarily.
• variables
• intermediate data

Q-02) How does the program counter register contribute to the execution of a program in a CPU?

- instruction fetch
- sequential execution
- control flow
- looping and iteration
- subroutine calls and returns
- exception handling.

$$(1 \cdot 3)a \cdot A + (4 \cdot 7)b + (0 \cdot 5)c + 7$$

Q=03) What role does the status register (FLAGS) play in the CPU, and what types of information does it typically contain?

Special purpose register in a CPU that contains information about the status or condition of the CPU and the outcome of previous arithmetic and logical operations. It plays a crucial role in the control flow and decision making within a CPU.

- status indication
- conditional branching
- decision making
- arithmetic overflow
- carry and borrow flags
- zero and sign flags
- parity flag
- interrupt control

Q=04) Why are registers considered the fastest form of memory in a computer and how does their speed impact overall system performance?

- proximity to the CPU
- high speed access
- reduced latency
- data locality
- parallelism and pipelining