

Gate Assignment

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1. In a given 8-bit general purpose micro-controller there are following flags. *C*-Carry, *A*-Auxiliary Carry, *O*-Overflow flag, *P*-Parity (0 for even, 1 for odd) *R0* and *R1* are the two general purpose registers of the micro-controller. After execution of the following instructions, the decimal equivalent of the binary sequence of the flag pattern [*CAOP*] will be ____.

```
1
2 MOV R0,+0x60
3 MOV R1,+0x46
4 ADD R0,R1
5
6
```

[EE GATE 2023]

Solution:

```
1
2 MOV R0,+0x60 ; %R0 <- 60H
3 MOV R1,+0x46 ; %R1 <- 46H
4 ADD R0,R1 ; %R0 <- [R0]+[R1]
5
```

	D_4	D_3
	0110	0000
	0100	0110
	1	
	<hr/>	
	1010	0110

$$60H + 46H = A6H \text{ i.e., } 10100110$$

Overflow(O) $\rightarrow 1$; Since if the two 8- bit data were considered as signed data then the result shows negative i.e., $MSB = 1$ in $A6H$ but both data bytes are positive.

Parity(P) \rightarrow Even, as there are four binary 1's in result $A6H$.

$P \rightarrow 0$.

For Carry Flag ($C \rightarrow 0$).... No carry bit out of Mantisa.

For auxillary carry ($AC \rightarrow 0$).

No carry from $D4$ to $D3$ bit.

$$[CAOP] \rightarrow [0010]_2 = (2)_{10}.$$