Gate Assignment

SHAIK MOHAMMAD SAHIL

OCTOBER 2023

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
```

$$
\begin{array}{r}
D_4 \quad D_3 \\
0110\ 0000 \\
0100\ 0110 \\
1 \\
\hline
1010\ 0110
\end{array}
$$

$60H + 46H = A6H$ 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.

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